

ASSESSMENT OF HEALTH STATUS OF UNDER-SIX-YEAR CHILDREN AT UHTC, SHARIFGANJ AREA OF KMC, KATI HAR, BIHAR

Purnendu Kumar Singh¹, Vishal Prasad²

¹Associate Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India.

²Junior Resident, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India.

ABSTRACT

BACKGROUND

Under-six-year children comprise approximately 17% of the total population of the 136 million children born each year in the world. Growing urbanisation is a recent phenomenon in the developing countries. Over the past five decades, India's urban population has increased manifold.

The aim of this study is to assess the health and nutritional status of under-six-year children at UHTC, Sharifganj area of KMC, Katihar, Bihar and with a view to study various socio-economic factors influencing their health status with a view to formulate prophylactic measures.

MATERIALS AND METHODS

An observational study of 1200 children (640 boys and 560 girls) was undertaken during August 2017 to March 2018 at urban health training centre Sharifganj area of KMC, Katihar, Bihar. The sample size was calculated on the basis of pilot survey. Children were classified on the basis of weight for age into various categories of malnutrition using IAP classification and NCHS standard.

RESULTS

Out of 1200 children in the present study, 756 (63%) were found to be normal. In the age group of 0 - < 1 year, 120 infants (84.7%) were found to be normal category. So, if we exclude the 0 - < 2 years children, 484 (40.33%) children were normal and 50.67% were malnourished (Grade I to Grade IV).

CONCLUSION

The higher prevalence of malnutrition in the urban area may be due to poor breast-feeding practices, lack of appropriate complementary feeding.

KEYWORDS

Under 6 Year Children, Breastfeeding, Immunization, Malnutrition, Supplementary Nutrition, Anthropometric Measurement.

HOW TO CITE THIS ARTICLE: Singh PK, Prasad V. Assessment of health status of under-six-year children at UHTC, Sharifganj area of KMC, Katihar, Bihar. J. Evolution Med. Dent. Sci. 2018;7(27):3130-3133, DOI: 10.14260/jemds/2018/703

BACKGROUND

An independent district since 1973, Katihar is primarily an agrarian region. Paddy is the chief commercial crop. However, the district also houses jute and paper mills.

While the total urban population of Katihar is 2, 18 and 246 and total rural population is 21, 71 and 287. Also, for every 1000 males, there are 919 females in the region. One of the interesting facts about Katihar is that it has only 23% of its population below poverty line. With a steadily increasing literacy rate and declining below poverty line mark, Katihar is surely making a mark of its own as one of the 38 districts of Bihar. Children are the assets of nation. In any community, children constitute a priority group.¹

In sheer numbers (0 - 6 years), children comprise approximately 17% of the population of the 136 million children born each year in the world, 90 percent are in the 3rd world.

'Financial or Other Competing Interest': None.
Submission 29-05-2018, Peer Review 23-06-2018,
Acceptance 28-06-2018, Published 02-07-2018.

Corresponding Author:

Dr. Purnendu Kumar Singh,

Associate Professor,

Department of Community Medicine,

Katihar Medical College, Katihar-854105, Bihar, India.

E-mail: purnendukumars@yahoo.com

DOI: 10.14260/jemds/2018/703



Although, the chances of survival of these new-borns has improved by 50 percent in the last 20 years, the first few hours, days and months of their lives are still an obstacle race. From the time of birth, 20 - 30 percent of babies are underweight. That makes them vulnerable to infection and disease. About 40 percent of the total infant mortality occurs in the first month of life.² Then comes the weaning period, when out of four surviving children receives neither the quality nor the quantity of food needed to replace the substances provided by mother's milk. Many low-cost measures are available for saving life of millions of children like immunizations, breastfeeding, birth spacing, growth monitoring, improved weaning and oral rehydration. Attention is focused on these elements of child health care in developing countries.^{3,4}

Growing urbanisation is a recent phenomenon in the developing countries over the past five decades. India's urban population has increased manifold. The proportion of the urban population in India has increased from 10.84% in 1901 to 25.72% in 1991 and was 27.8% in the year 2001.⁵

In childhood, health is measured in terms of growth of the child. The term "growth" implicates the physical maturation, i.e. increase in the size of body. It is biological phenomenon which influence on many factors like hereditary, nutritional and environmental can be readily observed and easily measured. Physical growth is an important indicator of child health and well-being. It can be affected by various factors

like genetic condition, environmental, nutritional, socio-economical and endocrinal influence etc.

According to ICMR (1987), socio-economic status plays a dominant role in growth and physical development of children from different socio-economic classes within the same community differ in their body size at all age. The influence of socio-economic factors is manifested in the nutrition and the entire environment, which the children are compelled to adopt. Children are the human resource and assets of a country.⁶ A nation is measured through the health of its children. It is therefore essential that children are allowed to grow in an environment which is suitable to meet their social, emotional and educational needs.

Adolphe Quatlet carried out extensive study on the height and weight of children in different age group and introduced the height and weight of children in different age group and introduced the "Anthropometry."⁷

Anthropometry provides single most portable universally applicable, inexpensive and non-invasive technique for assessing the size, proportion and composition of human body. It reflects both health and nutritional status and predicts performance, health and survival (WHO, Expert Committee Report).⁸

Aims and Objectives

To assess the health and nutritional status of under six year children at UHTC, Sharifganj area of KMC, Katihar, Bihar and with a view to study various socio-economic factors influencing their health status with a view to formulate prophylactic measures.

MATERIALS AND METHODS

The study was carried out by systemic random sampling method and every third house was selected for study. Thus, 760 houses where 1280 children reside were included in the study. The sample size was calculated on the basis of pilot survey results, wherein 32% under 6 year children were found to have low health profiles in the community surveyed. Rest on this with an acceptable error of 10% the sample size was obtained to be 850 using the formula.

$$n = \frac{4pq}{l^2}$$

Prior written consent was obtained from the parents to be included in this study. Altogether 80 children could not be included either due to refusal of the parent or the absence of the children even after repeated visits.

Thus, total sample size of the present study was 1200. As this study did not involve any patients or patient's records the Institutional Ethical Committee intimated that ethical clearance was not required.

This community based cross-sectional study was carried out during 2017 - 18. Mother of each child or local guardian was included in the study for personal interview in her own house followed by clinical examination and anthropometric measurement of the child, i.e. weight and height, housing condition, water supply and sanitary practices were looked for the same background characteristics like caste, religion, socio-economic status, demographic status, feeding practices, supplementary nutrition, immunization status, morbidity etc. All this information were recorded on a predesigned and

pretested proforma. The study was conducted on 1200 children in a group of 0 - 6 years. Besides other information, anthropometric measurement was done to assess their nutritional and health status.

The most reliable sources of information, viz. the immunisation card of the children and/or MCH card of the mother were checked. Data regarding the source of immunisation was also gathered. In absence of recorded evidence, verbal information from mother of children or father was gathered. Health status of children was studied after weighing the child on Salter's scale to the nearest of 100 grams and using the classification given by IAP with reference to the expected weight for age. The statistical analysis was carried out on SSPS version 17.0.

RESULTS

Total sample size of the present study was 1200.

Sex	Number	Percentage
Boys	640	53.3%
Girls	560	46.7%
Total	1200	100.00%

Table I. Showing Sex distribution of Pre-School Children

The above table shows the number of pre-school children sex-wise. Boys found to be 53.3% (640 cases) and girls were found to be 46.7% (560).

Age Group in Year	Number	Percentage
0 - <1	142	11.83
1 - <2	228	19.00
2 - <3	212	17.67
3 - <4	220	18.33
4 - <5	190	15.83
5 - <6	208	17.33
Total	1200	100.00

Table II. Showing Age distribution of Pre-School Children under 6 years of Age (0 - 6 years)

Maximum no. of children were found in 1 - < 2 years that is 19.00% (228) and minimum in 0 - < 1 years (142) that is 11.83%.

Religion	Number	Percentage
Hindu	433	36.08
Muslim	767	63.92
Total	1200	100.00

Table III. Showing distribution of Pre-School Children according to Religion

Above table shows the data in relation to religion. Muslim children were found to be 767 (63.92%) and Hindu was found to be 433 (36.08%).

Socio-Economic	Number	Percentage
I (upper)	34	4.47
II (upper middle)	92	12.11
III (lower middle)	104	13.68
IV (upper lower)	190	25.00
V (lower)	340	44.74
Total	760	100.00

Table IV. Showing Socio-Economic distribution of Family

Above table shows the distribution of family into five socio-economic groups depending upon education, occupation and income of the parent. Maximum no. of children belonged to socio-economic group V i.e. 340 (44.74%) and minimum in socio-economic group I i.e. 34 (4.47%).

Type of Immunization	Number of Children Immunised		Number of Children Not Immunised	
	Nos.	%	Nos.	%
BCG	960	80.00%	233	19.42%
Oral Polio	912	76.00%	287	23.92%
Pentavalent	888	74.00%	312	26.00%
Measles	156	13.00%	1045	87.08%

Table V. Showing Immunization Coverage of Children by at least one of the Immunizing Agent in relation to Sex

Above table is self-explanatory.

Nutritional Status	Number	Percentage
Above 80% (Normal)	756	63.0%
71-80% (Grade I)	214	17.83%
61-70% (Grade II)	181	15.08%
51-60% (Grade III)	44	3.67%
<50% (Grade IV)	5	0.42%
Total	1200	100.00%

Table VI. Showing Nutritional Status of Children (Nutritional Classification, Indian Academy of Paediatrics)

The above table shows that present study, the percentage of children in Grade I, II and III malnutrition were 17.83%, 15.08% and 3.67%. The percentage of normal children was 63.0% according to weight for age criteria.

Male					Age Group in Years	Female				
No. of Boys	Range	Mean Weight	±SD	±SE		No. of Girls	Range	Mean Weight	±SD	±SE
108	4.6-12.2	7.92	2.27	0.24	0 - <1	96	7.8-13.8	10.72	1.93	0.22
110	4.8-12.5	7.99	2.30	0.28	1 - <2	92	5.0-11.0	7.46	1.87	0.24
114	6.0-11.5	9.50	0.97	0.12	2 - <3	98	6.0-12.0	9.07	1.32	0.18
122	8.0-13.0	11.26	1047	0.17	3 - <4	94	7.0-13.0	9.96	1.47	0.20
92	10.0-19.0	14.75	2.85	0.39	4 - <5	82	8.0-14.5	11.93	1.83	0.26
94	9.0-20.0	14.92	2.92	0.37	5 - <6	78	8.0-18.0	13.58	2.82	0.37

Table VII. Showing Mean and Standard Deviation of Weight (in kg) by Age and Sex

Above table shows that the mean weight increases with age in both sexes. The total increase in mean weight between 0 and 6 years in boys was found to be 6.93 kg and in girls was 6.12 kg. In boys the mean weight was observed to be 7.99 kg for the age group 1 - < 2 and 14.92 kg for the age group 5 - < 6 years, whereas in the case of girls' mean weight for the age group 1 - < 2 was obtained to be 7.46 kg and for the age group 5 - < 6 was 13.58 kg. The overall mean weight for the age group 1 to 6 years obtained as 11.52 and 10.35 kg for boys and girls respectively. Overall, mean weight for all children under study was found to be 10.97 kg.

Male					Age Group in Years	Female				
No. of Boys	Range	Mean MUAC (cm)	±SD	±SE		No. of Girls	Range	Mean MUAC (cm)	±SD	±SE
108	7.3-11.0	10.7	1.26	0.14	0 - <1	96	6.9-11.2	10.11	1.17	0.13
110	8.2-12.5	11.02	1.35	0.17	1 - <2	92	7.5-12.5	10.82	1.29	0.16
114	10.3-13.5	11.41	1.03	0.12	2 - <3	98	9.7-14.3	11.03	1.61	0.22
122	11.0-14.7	12.50	0.96	0.11	3 - <4	94	10.3-14.4	12.12	1.15	0.16
92	12.1-16.2	13.80	1.13	0.15	4 - <5	82	11.4-15.2	13.25	1.28	0.18
94	12.3-16.5	14.63	1.37	0.17	5 - <6	78	11.2-17.1	14.01	1.09	0.14

Table VIII. Showing Mean and Standard Deviation of Left Upper Mid Arm Circumference (in cm) by Age and Sex

The above table shows that mean upper mid arm circumference (in cm) increases steadily with the increase in age in both sexes. In boys MUA circumference were obtained to be 11.02 cm in the age group 1 - < 2 and 14.63 cm in the age group 5 - < 6. Overall, mean mid arm circumference for all age were found to be 12.60 cm in boys and 12.22 cm in girls indicating that boys are having larger MUAC than that of girls.

DISCUSSION

The present work "Assessment of Health Status of Under Six Year Children at UHTC, Sharifganj Area of KMC, Katihar, Bihar," was conducted in urban population of Katihar, which is 8 km from Katihar Medical College.

It gives a very vulnerable and important result about socio-economic status, immunization status, nutritional status and anthropometric measurement.

Nutritional and Health Status of Community can be assessed by following Methods-

1. Clinical examination.
2. Laboratory and biochemical examination.
3. Anthropometric measurement.

Anthropometry provides the single most portable universally applicable, inexpensive and non-invasive technique for assessing the size proportion, composition of human body. It reflects both health and nutritional status and predicts performance, health and survival.⁹

Nutritional anthropometry is considered to be the best method for assessment of health status. It is considered with the measurement of variation in physical dimension and gross composition of the human body at different age levels. It is easy to perform and require only single apparatus.^{10,11}

Malnutrition is much more prevalent in developing countries. We come across very few cases of severe malnutrition. For it exhibits "Iceberg phenomenon," any case of overt malnutrition. We represent only the tip of the problem. The main bulk is submerged undetected in the community. By using anthropometric measurement, one can detect the subclinical malnutrition very easily.¹²

Assessment of health status of individual consequently for health assessment purpose, anthropometry is most useful parameter for assessing the nutritional status of children, particularly in developing countries.¹³

Jelliffe DB 1966, Bhandari and Jain 1972 also observed that the malnutrition especially in developing countries like India where resources of good food are limited.¹¹

ICMR (1972) reports that the weight, height and chest circumference complements are another and give information on nutritional status which is less in protein caloric malnutrition.¹⁴

OP Ghai (1977) emphasised the importance of anthropometry and detecting the malnutrition. Similar view also expressed by Dutta Banik et al (1973), Raghwan et al (1973) and Gupta (1977).¹⁵

Out of 1200 children in the present study, 756 (63%) were found to be normal. The children were classified on the basis of nutrition to indicate weight for age, into various categories of malnutrition using IAP classification and NCHS standard. In the age group of 0 - < 1 year, 120 infants (84.7%) were found to be normal category. So, if we exclude the 0 - < 2 years children as 484 (40.33%), children were normal and 50.67% were malnourished (Grade I to Grade IV). Table VIII showed that maximum cases of malnutrition are in the age group of 5 - < 6 years. 56 (41.35%) Grade I, 40 (19.23%) Grade II (40 cases, i.e. 21.05% in the age group 4 - < 5 years), 10 cases of 4.8% for Grade III and 2 cases (0.96%) for Grade IV (2 cases i.e. 1.33% in the age group of 4 - < 5 years). In Grade I malnutrition, minimum cases were recorded in the age group 1 - < 2 years (15) and 2 - < 3 years (20). In Grade II also minimum cases (4 cases 2.82%) were seen in the age group of 0 - < 1 year, so also in Grade III where only 3 cases (2.11%) were in 0 - < 1 year and 1 - < 2 years.

Thus, these studies are comparable and present a dismal picture of the health status of children of families residing in UHTC, Sharifganj area of Katihar Medical College, Katihar, Bihar.

CONCLUSION

The higher prevalence of malnutrition in the urban area may be due to poor breast-feeding practices, lack of appropriate complementary feeding, prevalent in society, discarding of

colostrum, delayed initiation of breast feeding, lack of education and higher number of children in low socioeconomic group is the prime reason for poor health profile of children in this region.

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pISSN- 2349- 2552, eISSN- 2349- 2570

JEBMH

Journal of Evidence Based
Medicine and Healthcare

Volume 2 Issue 12 / March 23, 2015

www.jebmh.com

Indexed in

1. DOI
2. Index Copernicus (ICV 2013- 5.64)
3. Google Scholar
4. Infotrieve Index- (IBI Factor- 3.76)
5. WHO HINARI
6. CrossRef



All articles published in JEBMH are
now assigned unique DOI numbers.

ORIGINAL ARTICLE

OBSERVATION ON INCREASE IN WEIGHT OF LOW BIRTH WEIGHT (LBW) BABIES BY IMPLEMENTING KANGAROO MOTHER CARE (KMC) TECHNIQUE

Purnendu Kumar Singh¹, Kumar Amritanshu², Bijoy Mukherjee³

HOW TO CITE THIS ARTICLE:

Purnendu Kumar Singh, Kumar Amritanshu, Bijoy Mukherjee. "Observation on Increase in Weight of Low Birth Weight (LBW) Babies by Implementing Kangaroo Mother Care (KMC) Technique". *Journal of Evidence based Medicine and Healthcare*; Volume 1, Issue 17, December 29, 2014; Page: 2162-2165.

ABSTRACT: Kangaroo Mother Care (KMC) is a practical technique for nursing of low birth weight babies by direct skin to contact with the mother. This study was undertaken to observe and record the effect of KMC with focus on increase in weight of at term low birth weight (LBW) babies weighing less than 2000 grams. The study was conducted over thirty six month's period from July 2011 to June 2014. The method of care consisted of skin to skin contact between the mother and the infant along with exclusive breast milk. Upon implementation of KMC babies under observation showed satisfactory gain in weight of average 25grams per day and an average hospital stay of 10 days. KMC aims towards achieving good weight gain in LBW babies. It is a simple hassle free technique which can be implemented at all levels of health care.

KEYWORDS: Kangaroo mother care, Low birth weight, Exclusive breastfeeding.

INTRODUCTION: Kangaroo mother care (KMC) is the term given to that method where a new born low birth weight baby is kept in direct skin to skin contact with the mother. This is a practically applicable technique for care of LBW babies. KMC involves exclusive breast feeding and promotes infant bonding with mother. KMC needs to be promoted for the caring of LBW babies.

MATERIAL & METHOD: This study was conducted by the Department of Community Medicine in the Department of Paediatrics of Katihar Medical College during thirty six months period from July 2011 to June 2014. Permission of the Institutional Ethics Committee was obtained prior to the study. The study included 100 at term LBW neonates of weight less than or equal to 2000 grams. Critical and malformed neonates and those mothers who were critically ill were excluded. Only stable babies delivered in the operation theatre of the Department of Obstetrics and Gynaecology, which were less than or equal to 2000 grams were admitted in the Department of Paediatrics for observation. Mothers and at least one female family member were explained about methods and advantages of KMC. All the babies admitted for observation KMC ward were given 24 hours continuous KMC even during night. Babies were removed from mother's chest during breast feeding, changing diapers and during mother's personal works. Babies were weighed naked on an electronic weighing machine on admission in KMC and daily during morning ward round until discharge. All babies were exclusively breast fed and those who were not sucking adequately were given expressed breast milk (EBM) with spoon. All babies were clinically examined daily for any signs of ill health. Babies with suspected or confirmed illness requiring advance life support were withdrawn from KMC for treatment and new babies were admitted to maintain the sample size. Babies were discharged when they showed a weight gain of minimum

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15gm/day for at least seven consecutive days, were stable without any signs of sepsis and mothers were confident for caring babies at home. On discharge mothers were advised for follow-up every week till babies weights reached to 2500grams. At the time of discharge they were advised to bring the babies immediately if they observed any abnormality. The main aim was to measure progress in weight and record duration of hospital stay.

OBSERVATION: In this study we maintained the sample size to observe the effect of KMC. Many mothers opted out of KMC as they became confident to handle the baby and wanted to continue KMC at home. We then included new mothers who were willing to perform KMC under observation. Among the at term 100 babies included for study, 40 were female and 60 were male. The weights of the babies were ranged between 1650 grams to 2000 grams. We observed an average increase of 15gm per day in male babies and 13gm per day in female babies. Refer to Tables 1&2.

Day (D)	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
No. (n)	60	60	60	60	60	60	60	60	60	60	60
Avg. Wt. (gm)	1803.51	-3	-5	-8	-11	+13	+19	+28	+34	+38	+42
Avg. Wt. (gm)/day	NIL	↓	↓	↓	↓	↑	↑	↑	↑	↑	+14.7
Range	348	↓	↓	↓	↓	↑	↑	↑	↑	↑	386
SD	105.75	↓	↓	↓	↓	↑	↑	↑	↑	↑	137.75

Table 1: Increase in weight of male babies in gm/day

D=Day.
 0=Birth.
 Avg =Average.
 ↑=Increase & ↓=Decrease.
 Wt=Weight.
 SD=Standard Deviation.

Day (D)	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
No. (n)	40	40	40	40	40	40	40	40	40	40	40
Avg. Wt. (gm)	1721.34	-4	-5	-6	-9	+13	+18	+23	+28	+32	+38
Avg. Wt. (gm)/day	NIL	↓	↓	↓	↓	↑	↑	↑	↑	↑	+12.8
Range	124	↓	↓	↓	↓	↑	↑	↑	↑	↑	138
SD	35.51	↓	↓	↓	↓	↑	↑	↑	↑	↑	51.51

Table 2: Increase in weight of female babies in gm/day

D = Day.
 0 = Birth.
 Avg =Average.

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↑=Increase & ↓=Decrease.

Wt = Weight.

SD = Standard Deviation.

DISCUSSION: KMC has been proposed as an alternative method for caring LBW neonate. The method was first implemented by Roy and Martinez in 1979 at Maternal and Child Institute of Bogota, Colombia. It consists of skin to skin contact, exclusive breast feeding and early discharge.^{1,2} In Nepal few institutes have adopted this technique to care for LBW babies.³ Because of loss of extra cellular fluid around 5-15% of weight loss occurs in newborn babies. The lowest weight loss occurs by 4-6 days of life and then gradually weight gain starts and birth weight is usually regained by 14-21 days of life.⁴ Discharge criteria in this study for LBW babies was a weight gain of at least 15 gm /day for six consecutive days. Average duration required to observe weight gain after starting KMC was 3-4 days on an average. Various other studies had shown that KMC babies had better average weight gain per day. A study done by Rao et al. from Mumbai showed average weight gain of 23.99 grams in KMC groups.⁵ Similarly Gupta M. et al. from Rajasthan showed average weight gain of 21.3 grams/day and Paul et al. from Delhi found average weight gain in KMC babies after first week of life were 15.9 gm /day.^{6,7} In our study we recorded an average weight gain of 15gm/day in males and 13gm/day in females. Gupta M et al observed mean duration of hospital stay was 15.5 days.⁶ KMC in infants in Merida had discharged at 13.4 days after enrolment.⁸ In Delhi average day of hospital stay was 27.2±7 days.⁸ In our study average duration of hospital stay was 10 days. KMC promotes exclusive breast feeding, ensures temperature maintenance, decrease neonatal morbidities.⁹ These findings were supported by our study also as all the babies were exclusively breast fed there was no clinical episode. Diaz-Rossello JL et al. found no evidence in difference in infant mortality in KMC as compared to conventional care after stabilisation.¹⁰

CONCLUSION: KMC is a useful and practical method of nursing LBW babies. Other advantages of this technique are low cost, promotes exclusive breast feeding practice and increases mothers confidence in handling small babies and builds good mother and infant bonding. As the sample size in our study is small (100 neonates) and the study was non-comparative, a future study with large sample size and comparative study between KMC and Conventional Method of Care of LBW baby can be undertaken to observe more reliable effect on weight gain and duration of hospital stay.

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AUTHORS:

1. Purnendu Kumar Singh
2. Kumar Amritanshu
3. Bijoy Mukherjee

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.
2. Associate Professor, Department of Paediatrics, Katihar Medical College, Katihar, Bihar.
3. Professor & HOD, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Purnendu Kumar Singh,
Assistant Professor,
Department of Community Medicine,
Katihar Medical College,
Katihar-854105, Bihar.
E-mail: purnendukumars@yahoo.com

Date of Submission: 18/12/2014.

Date of Peer Review: 19/12/2014.

Date of Acceptance: 26/12/2014.

Date of Publishing: 29/12/2014.

JEMDS

eISSN-2276-4802

pISSN-2276-4748

JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES

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ASSESSMENT OF NUTRITIONAL STATUS BY MID UPPER ARM CIRCUMFERENCE (MUAC) AMONG RURAL CHILDREN OF KATIHAR DISTRICT IN KOSI REGION OF BIHAR

Purnendu Kumar Singh¹, Bijoy Mukherjee²

HOW TO CITE THIS ARTICLE:

Purnendu Kumar Singh, Bijoy Mukherjee. "Assessment of Nutritional Status by Mid Upper Arm Circumference (MUAC) among Rural Children of Katihar District in Kosi Region of Bihar". *Journal of Evolution of Medical and Dental Sciences* 2015; Vol. 4, Issue 22, March 16; Page: 3823-3828, DOI:10.14260/jemds/2015/550

ABSTRACT: An observational study of 500 children (267 boys and 233 girls) was undertaken during 2008-2010 at primary health centres under the aegis of Katihar Medical College in Kosi region of Bihar to assess their nutritional status using mid upper arm circumference (MUAC) in Katihar district of Bihar. Children from remote villages in rural areas located approximately 30 km from Katihar district headquarters were observed. Information on age of the children were collected from their parents. Measurement was recorded in centimetres and was procured using the standard technique. Nutritional status was determined following the World Health Organization age and sex specific cut off points. Results revealed that mean MUAC among boys was higher than girls at all ages. Significant sex differences were observed at ages 3 ($p < 0.05$), 4 ($p < 0.05$) and 5 ($p < 0.05$) years. Overall under nutrition were similar in both sexes. This result implied that both the sexes were equally malnourished. An increasing trend in the rates of overall malnutrition from 3 to 5 years in both sexes was observed. Our study clearly indicated that the nutritional status of children of both sexes in this age group is a serious issue. It seems appropriate to expect much improvement in the form of enhanced supplementary nutrition than what is currently being offered by the ICDS scheme in Katihar district of Bihar.

KEYWORDS: Mid upper arm circumference, malnutrition, supplementary nutrition.

INTRODUCTION: India still succumbs to the colossal problem of child malnutrition. Malnutrition is a burden on a considerable proportion of population the most vulnerable being the youngest of the country.⁽¹⁾ Under nutrition in childhood was and is one of the reasons behind the high child mortality rates observed in developing countries including India. It is highly detrimental for the future of those children who survive.⁽²⁾ Chronic under nutrition in childhood is linked to slower cognitive development and serious health impairments later in life that reduce the quality of life of individuals.⁽³⁾ Nutritional status is an important index of this quality.⁽⁴⁾ Improved child health and survival are considered universal humanitarian goals. In this respect, understanding the nutritional status of children has far reaching implications for the better development of future generations.⁽⁵⁾ Child growth is universally used to assess adequate nutrition, health and development of individual children, and to estimate overall nutritional status and health of populations. Compared to other health assessment tools, measuring child growth is a relatively inexpensive, easy to perform and non-invasive process.^(6, 7, 8) During preschool age period, children have special nutritional needs because of their extensive growth and development.^(6, 7, 9) Under nutrition among pre-school children is a colossal public health problem even today in rural India^(10, 11, 12, 13, 14) including Bihar. There is scanty information of the prevalence of under nutrition among preschool children in India^(9, 15) and Bihar.^(16, 17) Anthropometric examination is an almost mandatory tool in any research on health and

nutritional condition in childhood and the study of nutritional status is of great importance for the understanding of the social wellbeing in a population.^(18, 19) The mid upper arm circumference (MUAC) is an important measurement which is often used for the assessment among pre-school children. In community based studies, MUAC appears to be a superior predictor of childhood based anthropometric indicators.⁽⁶⁾ MUAC is a relatively simple index, but with a fixed cut off, it ignores age-related changes. Compared with weight for height, MUAC has a sensitivity of 24.6% and a specificity of 94.8%⁽²⁰⁾ appears to be a better predictor of childhood mortality than is weight for height.⁽²¹⁾ Currently available evidences indicate that MUAC is the best in terms of age independence, precision, accuracy, sensitivity and specificity, case-detection method for severe malnutrition and that it is also simple, cheap and acceptable.⁽²²⁾ As measurement of MUAC can be taken by minimally trained health workers and is a reliable indicator of nutrition the aim of the present study was to evaluate the nutritional status of rural children of Bihar from Katihar district using the World Health Organization⁽⁶⁾ age and sex specific MUAC cut off points.

MATERIALS & METHODS: This observational study was undertaken during the period from November 2008 to October 2010 at three primary health centres of Katihar Medical College in Katihar district headquarters of Kosi region of Bihar. Children under observation were residents of remote villages in rural areas located approximately 30 km from proper Katihar town. MUAC of children with ages ranging from 2-5 years was recorded using standard technique after obtaining official approval from Institutional Ethics Committee. A total of 500 children (Boys = 267; Girls = 233) aged between 2-5 years were included in the present study. Information on age of the children was collected from their parents. Measurement in centimetres was taken using measuring tape.

OBSERVATIONS: Differences were observed in MUAC among children of both sexes which were recorded and statistically analyzed.

Parameter	Boys	Boys	Girls	Girls
Age in years	- 2 SD	- 3 SD	- 2 SD	- 3 SD
2	13.6	12.2	13.4	12.0
3	13.8	12.2	13.6	12.2
4	14.1	12.6	13.9	12.4
5	14.2	12.6	14.1	12.5

Table 1: The WHO (1995) recommended cut-off points for MUAC (cm) by age and sex

Age in years	Boys	Girls
2	13.1	12.7
3	13.3	12.9
4	13.5	13.1
5	13.7	13.3

Table 2: Sex differences in MUAC by age

Age in years	Undernutrition in boys	Undernutrition in girls
2	58 (21.72%)	48 (20.60%)
3	63 (23.60%)	55 (23.60%)
4	69 (25.82%)	61 (26.18%)
5	77 (28.84%)	69 (29.61%)
	n = 267 (24.995%)	n = 233 (24.997%)

Table 3: Assessment of nutritional status of the children studied upon

States	Prevalence	References
Punjab	38.52 %	Kaur & Singh (2005)
Odisha	58.00%	Mishra & Mishra (2007)
West Bengal	28.60%	Chatterjee & Saha (2008)
Bihar*	24.99%	Singh & Mukherjee (2015)

Table 4: State wise comparison of overall prevalence of undernutrition among pre-school children based on MUAC

Present study*

DISCUSSION: The sex differences in mean MUAC by age are presented in Table 2. Results revealed that mean MUAC among boys was higher than girls at all ages. Significant sex differences were observed at ages 3 years and 4 years. Significant sexual dimorphism in mean MUAC at ages 3 and 4 years could be a result of differential rate of fat deposition at this site between the sexes. No such significant sexual dimorphism was observed at age 3. Sexual dimorphism in adiposity deposition and distribution has been well documented by earlier studies worldwide^(5, 6, 23) in different populations. The prevalence of under nutrition among the children in our study is presented in Table 3 which shows overall under nutrition were similar in both sexes (Boys = 24.995%; Girls = 24.997%). This result implied that both the sexes were experiencing similar nutritional stress. In general, there was an increasing trend in the rates of overall under nutrition from 3 to 5 years in both sexes. Prevalence of under nutrition of the present study clearly show higher rates than the pre-school children of Jaffna, Sri Lanka in post Exodus period.⁽²⁴⁾ That study revealed that the percentages of the preschool children within the age groups 1-2, 3-4 and 5-6 years affected by severe and moderate acute malnutrition were 44.85%, 18.07% and 2.29%, respectively. Whereas, in an earlier study⁽²⁵⁾ it was found that the prevalence of acute malnutrition in Jaffna district, Sri Lanka in 1993 (prior to exodus in 1995) was 18.5%. Considering the Indian context (Table - 4), the prevalence of under nutrition among the preschool children of the present study was higher than those reported among preschool children from Punjab⁽²⁶⁾ and Kolkata.⁽¹⁾ The rates were 38.5% and 28.6%, respectively. The rate of under nutrition among the pre-school children from Central Orissa (by using MUAC) was comparatively higher at 58.0%.⁽²⁷⁾ Our study clearly indicated that the nutritional status of these children was serious with very high but similar rates of under nutrition in both sexes. Nevertheless, it must be mentioned here that detailed relationships between morbidity, mortality and various socio-economic factors with childhood undernutrition, based on MUAC, are not being reported in this

study. Along with this the lack of information on detailed dietary history of the subjects is the limitation of our study. Due to this lack of information it is not possible to draw any conclusion regarding the quantity and quality of food given to the subjects at their homes. Nevertheless our results clearly indicated that there existed distinct nutritional deprivation among the subjects regardless of their food intake. MUAC may be useful in clinical settings.⁽²⁸⁾ Younger children tended to become upset and agitated during both height and weight measurements and that no such behaviour was observed during the measurement of MUAC.⁽²⁹⁾ Considering the rates of stunting, underweight and wasting among the same population, very high prevalence of undernutrition was also noticed.⁽³⁰⁾

CONCLUSION: In conclusion, our study clearly indicated that the nutritional status, based on MUAC, of these children was serious with high rates of undernutrition in both sexes. We suggest that more studies dealing with undernutrition based on MUAC should be undertaken among children from different districts of Bihar. It has been recommended that MUAC be used to determine nutritional status among children of different ethnic groups worldwide, particularly in developing countries. Such investigations will allow us to not only to compare the rates of three conventional measures of undernutrition with MUAC, but also help to demonstrate the enhanced utility and effectiveness of the latter measure. Since the vast majority of the Indian population reside in rural areas where the rates of childhood undernutrition are very high, such studies should concentrate on rural children. Effective health and nutritional promotion programmes can be formulated based on the findings of these researches with the ultimate objective of reducing childhood nutrition in these areas.

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AUTHORS:

1. Purnendu Kumar Singh
2. Bijoy Mukherjee

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.
2. Professor & HOD, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Purnendu Kumar Singh,
Assistant Professor,
Department of Community Medicine,
Katihar Medical College,
Katihar-854105, Bihar.
E-mail: purnendukumars@yahoo.com

Date of Submission: 13/02/2015.

Date of Peer Review: 14/02/2015.

Date of Acceptance: 04/03/2015.

Date of Publishing: 14/03/2015.

HYPERTENSION AND ITS RISK FACTORS- A CROSS SECTIONAL STUDY IN RURAL AREAPurnendu Kumar Singh¹, Arun Kumar Pandey², Soni Rani³¹Associate Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.³Second Year, Postgraduate Trainee, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.**ABSTRACT****BACKGROUND**

An elevated arterial pressure is probably the most important public health problem in developing & developed countries. Hypertension is the commonest cardiovascular disorder and one of the major risk factor for cardiovascular mortality.

MATERIALS AND METHODS

The present study was conducted in rural field practice area of the Department of Community medicine Katihar Medical College, Katihar. A sample of 500 families was selected by systematic sampling technique from all the families registered at Health Centre and all the persons aged 20 years and above residing in these families were selected for the purpose of the study.

RESULTS

In total 1680 study subjects, 602 persons (35.8%) aged 20 years & above were found to be hypertensive. It shows that hypertension increased with increasing age with peak in 60 + years category (65.6%). The prevalence was found to be 66.2% in persons with high salt intake and 31.2% and 20.3% respectively in average and low salt intake. The prevalence of hypertension was 40.3% in non-vegetarians and 34.7% among vegetarians. The prevalence was 48.4% in persons consuming saturated fats, 39.1% in those consuming unsaturated fats and 32.6% in both types of fat consumers. The prevalence of hypertension was 37.9% in those engaged in light physical activity while it was found to be 29.6% in moderate and 28.6% in heavy physical activity. It was found to be 91.2% in obese while this was 23.4% and 18.9% respectively in normal and underweight. It showed that prevalence of hypertension was 38.3% in occasional, 40.0% in frequent and 73.1% in constant group and only 33.0% in group with no mental stress.

CONCLUSION

This study shows that the prevalence of hypertension was high in the subjects having low physical activity, High BMI and high saturated fat/salt intake and high level of mental stress.

KEYWORDS

Hypertension/BMI/Physical Activity/Saturated Fat/Unsaturated Fat.

HOW TO CITE THIS ARTICLE: Singh PK, Pandey AK, Rani S. Hypertension and its risk factors- a cross sectional study in rural area. J. Evid. Based Med. Healthc. 2017; 4(44), 2663-2667. DOI: 10.18410/jebmh/2017/529

BACKGROUND

Worldwide, hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total deaths. Hypertension accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS.¹ High blood pressure is ranked as the third most important risk factor for attributable burden of disease in south Asia.² Hypertension (HTN) exerts a substantial public health burden on cardiovascular health status and healthcare systems in India. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India.³ High dietary salt intake presents a major challenge to the kidneys to

excrete large amounts of salt administered. One of the main organ systems vulnerable to the adverse effects of excessive sodium in the diet is the cardiovascular system. Excess dietary sodium predisposes to high BP.^{4,5} Vegetarians have a much lower prevalence of hypertension compared to meat eaters⁶ Hypertensive men reported higher dietary intakes of fat and salt and hypertensive women reported higher dietary intakes of protein and salt than normotensive age-matched men and women, respectively. The findings reported high intake of fat, protein and salt to the risk factors for Hypertension in India.⁷ An increase in BMI was significantly associated with increased SBP and DBP.⁸ Physical activity is commonly recommended as an important lifestyle modification that may aid in the prevention of hypertension. Recent epidemiologic evidence has demonstrated a consistent, temporal, and dose dependent relationship between physical activity and the development of hypertension.^{9,10} Stress can cause hypertension through repeated blood pressure elevations as well as by stimulation of the nervous system to produce large amounts of vasoconstricting hormones that increase blood pressure.

Financial or Other, Competing Interest: None.

Submission 08-05-2017, Peer Review 16-05-2017,

Acceptance 27-05-2017, Published 30-05-2017.

Corresponding Author:

Dr. Purnendu Kumar Singh,

Doctor's Quarters, Block No-10, Flat No.-10,

Katihar Medical College, Katihar.

E-mail: drpkumarsinghap@gmail.com

DOI: 10.18410/jebmh/2017/529



Factors affecting blood pressure through stress include white coat hypertension, job strain, race, social environment, and emotional distress. Furthermore, when one risk factor is coupled with other stress producing factors, the effect on blood pressure is multiplied. Overall, studies show that stress does not directly cause hypertension, but can have an effect on its development.¹¹

There is need to creating awareness regarding personal and dietary factors related to hypertension in community.

Objectives

The objectives of present study were (1) To know the prevalence of hypertension in a rural population aged 20 years and above (2) To study the risk factors associated with hypertension in rural population.

MATERIALS AND METHODS

The present cross sectional study was carried out in rural population of Katihar district with the objective of finding out the prevalence of hypertension in persons aged 20 years and above and to study the epidemiological factors influencing the disease.

The prevalence of hypertension in various studies comes out to be 6 to 10% in 20-60 age group.¹² Therefore by taking prevalence of 6% confidence level 95% with a relative precision of 20% the sample size was calculated by adopting the formula:

$$n = \frac{Z^2 \times P \times Q}{d^2}$$

Where Z = (Value of Z at 95 % = 1.96)

P = Prevalence

q = (100-P)

d = Probable error (absolute or relative precision).

By using 6% anticipated prevalence with 20% relative precision, following sample size was obtained for the study.

$$\begin{aligned} n &= \frac{(1.96)^2 \times 6 \times (100 - 6)}{20\% \text{ of } 6 \times 20\% \text{ of } 6} \\ &= \frac{3.84 \times 6 \times 94}{1.2 \times 1.2} \\ n &= 1504 \end{aligned}$$

According to NFHS-3 data.¹³ the average mean size of household in Bihar is 5.48 in rural areas. Considering the population below 20 years being approximately 50% and a family size of 6, a minimum sample of 500 families has been studied. The present study was conducted in rural population of Katihar comprising of 14,661 persons belonging to 1786 families at rural Health Centre, Hazipur,

which is the field practice area of the Department of community medicine, Katihar Medical College. Among 1786 families 500 families selected by systematic random sampling technique. In all 500 families comprised of 2694 individuals. The numbers of persons aged 20 years and above were 1986. Efforts were made to interview and examine all the 1986 eligible persons by making repeated visits to the families, however only 1680 (84.59%) could be interviewed and examined and the rest 306 (15.40%) could not be covered due to non-availability. The information was collected on a structured, pre-coded and pretested schedule. Data was analyzed using statistical package Epi Info 7.0 software. As this study did not involve any patients or patient's records, the institutional ethical committee intimated that ethical clearance was not required. Salt intake was assessed with the help of salt measures used to take salt to mix in the food during cooking and additional salt added during eating.¹⁴

Individuals were grouped into 3 groups -

- Low salt Intake- One who does not add and never had added salt to cooked food at all and also avoids salty foods.
- Average salt Intake: One who adds salt to cooked food only if, after prior tasting found it insufficiently salty for the palate, and also eats salty foods.
- High Salt Intake: One who adds salt to cooked food routinely, as without prior tasting for degree of saltiness and prefers salty foods.

In the questionnaire the question was asked about type and frequency of saturated and unsaturated fat consumption as cooking medium. Among saturated fat consumption the option given was type of cooking oil subjects using i.e. palm oil, Coconut oil, Ghee, Butter, while among unsaturated fat the cooking medium primarily was Sunflower oil, Rice brawn oil and safflower oil.¹⁵

Physical activity was measured by occupation and Spare time activities.¹⁶

For stress assessment a short 4 item scale was made from (questions 2, 4, 5 and 10) Perceived Stress Scale- 10 item scale and PSS scores are obtained by reversing responses to the two positively stated items. (e.g., 0 = 2, 1 = 1, 2 = 0) 0 = Never 1 = Sometimes 2 = Often

Subjects who had a score of more than 4 were considered as having stress.

OBSERVATION AND RESULTS

In the present study the total sample size was 1680 (Male- 853 and Female- 827). The prevalence of hypertension in community was 35.8%. The prevalence of hypertension among male and female was 34.7% and 37.0% respectively.

Age (yrs.)	Study Population	Male		Study Population	Females		Study Population	Total	
		No.	%		No.	%		No.	%
20-24	102	10	9.8	97	02	2.1	199	12	6.0
25-29	82	17	20.7	99	09	9.1	181	26	14.4
30-34	113	25	22.1	100	17	17.0	213	42	19.7
35-39	95	29	30.5	101	27	26.7	196	56	28.6
40-44	108	37	34.3	76	34	44.7	184	71	36.6
45-49	91	39	42.9	83	47	56.6	174	86	49.4
50-54	93	44	47.3	85	50	58.8	178	94	52.8
55-60	95	41	43.2	97	67	69.1	192	108	56.3
60+	74	54	72.9	89	53	59.6	163	107	65.6
Total	853	296	34.7	827	306	37.0	1680	602	35.8

Table 1. Prevalence of Hypertension According to Age and Sex

Age: $\chi^2 = 276.41$, $df = 8$, $P < 0.001$.

The prevalence of hypertension was gradually increasing with age and maximum in 60+ age group which was statistically significant. The prevalence was more in female (37.0%) as comparison to male subjects (34.7%).

Salt Intake	Study Population		Hypertension	
	Number	Percentage	Number	Prevalence (%)
Low	158	9.4	32	20.3
Average	1250	74.4	390	31.2
High	272	16.2	180	66.2
Total	1680	100.0	602	35.8

Table 2. Salt Intake and Hypertension

$\chi^2 = 137.27$, $df = 2$, $P < 0.001$.

The prevalence of hypertension was found to be significantly higher in persons with high salt intake (66.2%) than those with average and low salt intake (31.2% and 20.3% respectively). The difference was found to be statistically significant. ($P < 0.001$).

$\chi^2 = 28.17$, $df = 2$, $P < 0.001$.

The prevalence of hypertension was found to be higher in persons consuming saturated fats (48.4%). While prevalence of hypertension was 39.1% in those consuming unsaturated fats and minimum (32.6%) in both type of fat consumers. This difference was found to be statistically significant ($p < 0.001$).

Type of Diet	Study Population		Hypertension	
	No.	%	No.	Prevalence (%)
Vegetarian	1467	87.3	509	34.7
Non-Vegetarian	213	12.7	93	43.7
Total	1680	100.0	602	35.8

Table 3. Type of Diet and Hypertension

$\chi^2 = 6.50$, $df = 1$, $P = 0.01$.

A majority of study population were vegetarian (87.3%) with only 12.7% being non-vegetarians. It was found that the prevalence of hypertension was higher in non-vegetarians (43.7%) than vegetarians (34.7%) with a statistically significant difference. ($P < 0.05$).

Body Mass Index (kg/m ²)	Study Population		Hypertension	
	No.	%	No.	Prevalence (%)
Underweight	583	34.7	110	18.9
Normal	744	44.3	174	23.4
Overweight	182	12.0	162	89.0
Obese	171	8.9	156	91.2
Total	1680	100.0	602	35.8

Table 5. Body Mass Index and Hypertension

$\chi^2 = 575.15$, $df = 3$, $p\text{-value} < 0.001$.

The prevalence of hypertension was found to be maximum in obese (91.2%). While the distribution was lower in normal and underweight (23.4% and 18.9% respectively). This difference of prevalence of hypertension with BMI was found to be statistically significant ($p < 0.001$).

Type of Fat Consumed	Study Population		Hypertension	
	No.	%	No.	Prevalence (%)
Saturated	318	18.9	154	48.4
Unsaturated	64	3.8	25	39.1
Both	1298	77.3	423	32.6
Total	1680	100.0	602	35.8

Table 4. Fat intake and Hypertension

Type of Physical Activity	Study Population		Hypertension	
	No.	%	No.	Prevalence (%)
Light	1267	75.4	480	37.9
Moderate	378	22.5	112	29.6
Heavy	35	2.1	10	28.6
Total	1680	100.0	602	35.8

Table 6. Physical Activity and Hypertension

$\chi^2=9.45$, $df=2$, $P<0.05$.

The prevalence of hypertension was higher in those engaged in light physical activity (37.9%) while it was found to be lower in those with moderate (29.6%) and heavy (28.6%) physical activity. This difference was found to be statistically significant. ($P<0.05$).

Level of Mental Stress	Study Population		Hypertension	
	No.	%	No.	Prevalence (%)
No stress	1180	70.2	389	33.0
Occasional	230	13.7	88	38.3
Frequent	218	12.9	87	40.0
Constant	52	3.1	38	73.1
Total	1680	100.0	602	35.8

Table 7. Mental Stress and Hypertension

$\chi^2=22.5$, $df=3$, $P<0.001$.

The prevalence of hypertension was higher in occasional (38.3%), frequent (40.0%), and constant (73.1%) groups as compared to no mental stress (33.0%) and this difference in prevalence of hypertension in relation to mental stress was statistically significant ($P<0.001$).

DISCUSSION

In this study also prevalence of hypertension was 35.8 % which was gradually increasing with age and maximum in 60+ age group. The result can be compared with study conducted by Gupta R. and Thankappan KR.¹²

Males have shown lower prevalence of HTN (34.7%) compared to females (37.0 %). Finding of our study can be compared by studies done by Malhotra P.¹⁷ in North India and Joseph A.¹⁸ in Trivandrum showed the prevalence in females to be higher than males.

In this study also the prevalence of hypertension was found to be significantly higher in persons with high salt intake. The finding can be compared by study done by Hazarika NC.⁵ in tea garden workers of Assam.

Our study showed a significant association between diet and hypertension. This finding was consistent with findings of Rouse IL.⁶ which also showed low prevalence of hypertension among vegetarians.

In this study this was found that higher intakes of cholesterol and saturated fat are associated with increased prevalence of hypertension. Similar to this study, a study done by Kodali V.⁷ also showed a significant association between dietary pattern and hypertension.

The present study showed BMI as strong predictor of blood pressure, the finding similar to study done by Kumanyika et al¹⁹

Our study showed that physical inactivity is significantly associated with hypertension. Studies done by Brook RD.⁹ and Chobanian AV showed the similar association between physical activity and hypertension.

Our study has shown a significant association between hypertension and stress. In a study conducted by Yadlapalli

S Kusuma in 2009 on Perceptions on hypertension among migrants in Delhi, City life has been perceived as a major predisposing factor for developing hypertension. City life has been corroborated with pollution and adulteration of food, high fat diet along with physical inactivity and stress.²⁰

CONCLUSION

There is association between various dietary and personal factors and prevalence of hypertension. There was a significant association between age, sex, salt intake, fat consumption, diet and prevalence of hypertension. Personal factors i.e. Body mass Index, Low physical activity and high stress were also associated with high prevalence of hypertension. There is need of creating awareness regarding personal and dietary factors associated with hypertension. Practice of art through mental relaxation through our traditional teachings like yoga and meditation has to be promoted. This might help in bringing down the stress in our daily lives.

Strength

The strength of the study was that it was a population based cross-sectional study to find the prevalence and risk factors related to hypertension among population above 20 years of age in rural area. The sample size was large and bias was taken care of by random sampling. In the present study an attempt was made to increase the knowledge and awareness level regarding personal and dietary factors associated with hypertension.

Limitations

In spite of the best efforts to convince all the study subjects to participate in the study, 306 (15.40%) study subjects did not cooperate. There was difficult to convince some of the subjects to cooperate in the study and also at time members were not present at their houses so alternative persons had to be put in place which required more time.

Recommendations

Non communicable disease like hypertension has gained rapid momentum in both rural and urban population. It was against this background that the present study was undertaken with aim to study the prevalence of hypertension and its associated risk factors. Salt consumption should be curtailed in the diet as it strongly influences the blood pressure and for it proper education should be provided to people. Proper precautions should be taken to check the excess growth of body weight. It is advisable to control it before it grows uncontrolled. People should be encouraged to undertake regular physical exercise and should avoid sedentary lifestyle. Mental stress should be controlled by either change in lifestyle or by undertaking yoga or meditation exercise.

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A STUDY OF PREVALENCE OF OVERWEIGHT AMONG DRIVERS AND CONDUCTORS OF PURNEA-KATI HAR, KOSI DIVISION, KATI HAR

Iqbal Shahid¹, Prawin Chandra²

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

ABSTRACT

BACKGROUND

Overweight has become a major disorder affecting a large population more than any other disease in the world. The aim is to study the prevalence of overweight and obesity among drivers and conductors of Purnea-Katihar and to compare the prevalence of overweight among them.

MATERIALS & METHODS

Randomly selected 365 drivers and 370 conductors were personally interviewed using predesigned, pretested structured questionnaire, physical examination was done to measure height, weight, waist circumferences and hip circumferences. Body Mass Index, waist circumferences and waist-hip ratio were used to assess control and overweight cases, and rates were calculated. Chi-square test was used to test the difference of prevalence between drivers and conductors.

RESULTS

The study showed that in drivers 43.3% were overweight, 22.2% were obese and 23.6% were having a waist circumference > 102 cm. Among conductors, 28.1% were overweight, 16.2% were obese and 18.1% were having a waist circumference of > 102 cm.

CONCLUSION

The prevalence of overweight was high among drivers compared to conductors. The differences were found to be statistically significant, considering the high prevalence of overweight among drivers and conductors, and necessary preventive measures need to be promoted. The control of overweight by dietary changes and increase in physical activity is recommended.

KEYWORDS

Overweight, Drivers, Conductors

HOW TO CITE THIS ARTICLE: Iqbal S, Chandra P. A study of prevalence of overweight among drivers and conductors of Purnea-Katihar, Kosi division, Katihar. *J. Evolution Med. Dent. Sci.* 2017;6(30):2451-2454, DOI: 10.14260/jemds/2017/529

BACKGROUND

Overweight or obesity is caused by abnormal growth of adipose tissue due to enlargement of fat cell or an increase in number of fat cells. Being overweight is a chronic disease that is increasing in prevalence and is posing a serious risk for development of various diseases like hypertension, diabetes mellitus, hyperlipidaemia, coronary heart disease, gall bladder disease, osteoarthritis and certain forms of cancer.⁽¹⁾ In the World Health Report of April 25th 2003, WHO identifies overweight and its complications among the top 10 global risks affecting today's disease and disability which accounts for 40% of Global Death.^(2,3)

Overweight is the fifth leading risk of global deaths. Worldwide, obesity has more than doubled since 1980. In 2008, more than 1.4 billion adults, 20 years and old, were overweight. Of these, over 200 million men and nearly 300 million women were obese. In 2012, more than 40 million children under 5 years of age were overweight. Once considered a high income country problem, overweight and obesity are now raising in low and middle income

countries, particularly in urban setting. Close to 30 million overweight children are living in developing and 10 million in developed countries.⁽⁴⁾ In India, the noncommunicable risk factor phase 2 was carried out in the year 2007-2008, in states of Andhra Pradesh, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttarakhnad and Mizoram. The survey shows high prevalence of overweight in all age groups except in 15-24 years group. Overweight prevalence was higher among females and males and in urban areas than rural areas, low prevalence was recorded among people with lower level of education (illiterate and primary level) and in people whose occupation was connected with agriculture or manual work.⁽⁵⁾

In India, 13 percent males and 2.5 percent females aged more than 20 years were obese in the year 2008.⁽⁶⁾ Obesity can occur at any age and generally increases with age. Infants with excessive weight gain have an increased incidence of obesity in later part of life.⁽⁷⁾ Weight control is widely defined as approaches to maintaining weight within a healthy (i.e. normal or acceptable) range of body mass index of 18.5 to 24.9 Kg/m² throughout adulthood [WHO expert committee 1995]. It should also include prevention of weight gain of more than 5 Kg in all people. In those who are already overweight, a reduction of 5-10 percent of body weight is recommended as an initial goal.⁽⁸⁾

The bus drivers and conductors are one such group who are at a risk of developing overweight due to nature of their profession. They form one of the largest groups of employing personnel of different caste and creed, various age groups,

Financial or Other, Competing Interest: None.

Submission 05-01-2017, Peer Review 30-03-2017,

Acceptance 06-04-2017, Published 13 04-2017.

Corresponding Author:

Iqbal Shahid,

Husainabad, Choudhri Mohalla,

Katihar, Bihar-859105

E-mail: shahidiqbalkms@gmail.com

DOI: 10.14260/jemds/2017/529



subjected to severe stress and strain, having irregular hours of duty, having habits like smoking and alcohol, etc. Once they develop overweight they are prone to develop hypertension, coronary heart disease and stroke putting them and their road users at risk. Hence, there is a need to enquire into the prevalence of overweight in the community setting of bus drivers and conductors. It was against this backdrop of importance of overweight, coupled with lack of community based studies in this subject in bus drivers and conductors we were prompted to take up the present study.

The aims and objectives of the study were to see and measure the prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division, Katihar.

MATERIALS AND METHODS

A cross sectional study was undertaken to see the prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division in Katihar. The study was conducted for a period of one year from Oct. 2015-Sep. 2016. The prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division, Katihar was not known to calculate the sample size, the prevalence was supposed to be 50% with a 10% relative error of prevalence. The sample size arrived at was 400 i.e. 400 drivers and 400 conductors. However, 365 drivers and 370 conductors participated in the study. All were male.

The study participants were personally interviewed using predesigned and pretested structured questionnaire. The instruments used in the study included height stand (accurate up to 1 cm), measuring tape (accurate up to 1 cm), weighing machine (accurate up to 0.5 kg). All the instruments and techniques were initially standardised during pilot study and were regularly standardised throughout the period of

data collection. The weighing machine was also checked and corrected, if required after every 10th reading during the study period. Body Mass index [BMI = Weight / (height in metre)²] was used to assess overweight. Waist circumference and Waist-Hip Ratio (WHR) were used to assess central obesity. According to WHO criteria, overweight is defined as BMI>25, obesity is defined as BMI>30 and overweight is defined as WHR> 1 and waist circumference > 102 cm. Overweight reflects an increased risk for cardiovascular disease and other metabolic complications.⁽¹⁾

The medical ethics committee of KMC has gone through the report and considered the proposed research work. The committee has no objection if the research work is done after the consent is taken from the study population. Data was analysed using the software SPSS 10.0.1 for windows. Summary figures like rates were calculated, Chi-square test was used to test the difference of prevalence of overweight between drivers and conductors.

RESULTS

Drivers 400 and conductors 400 were selected randomly, but only 365 drivers and 370 conductors participated in the study.

The minimum age of the study participants was 26 years for drivers and 25 years for conductors and maximum age was 57 years for drivers and 55 years for conductors. All the study participants were male. Most of the drivers (36.7%) and conductors (34.9%) were in the age group of 40-49 years.

The present study showed that 43.3% of drivers and 28.1% of conductors were overweight. This difference among drivers compared to conductors was found to be statistically significant (Table 1).

Status BMI	No. of Cases	
	Drivers (n=365)	conductor (n=370)
Underweight (<18.5)	17(4.7%)	20 (5.4%)
Normal weight (18.5-24.99)	190(52.0%)	246 (66.5%)
Overweight (>25)	158 (43.3%)	104 (28.1%)
$\chi^2 = 18.533, df = 2; p = 0.000$		

Table 1. Distribution of Cases Accordingly to BMI

The prevalence of overweight according to WHR>1 was 21.1% among drivers and 14.1% among conductors and this

difference was also statistically significant (p=0.012) (Table-2).

Waist-Hip Ratio	No. of Cases	
	Drivers (n=365)	Conductors (n=370)
< 1	279 (76.4%)	303 (81.9%)
> 1	86 (23.6%)	67 (18.1%)
$\chi^2 = 6.296; df = 1; p = 0.012$		

Table 2. Distribution of Cases Accordingly to Waist-Hip Ratio

Similarly, the prevalence of central obesity according to waist circumference (waist- circumferences>102 cm) was 23.6% among drivers and 18.1% among conductors. This

difference among drivers compared to conductors was also statically significant (p=0.069) (Table-3).

Waist Circumference	No. of Cases	
	Drivers (n=365)	Conductors (n=370)
< 102 cm	279 (76.4%)	303 (81.9%)
> 102 cm	86 (23.6%)	67 (18.1%)
$\chi^2 = 3.315; df = 1; p = 0.069$		

Table 3. Distribution of Cases of According to Waist Circumference

Among the drivers and conductors who were obese, most of them were having a mixed diet.

DISCUSSION

The present study revealed that the prevalence of overweight and obesity was 43.3% and 22.2% respectively in drivers and 28.1% and 16.2% respectively in conductors. The prevalence in this study is higher as compared to various previous studies⁽⁹⁻¹⁴⁾ done on general population groups. These studies showed a prevalence ranging from 7% to 34%. According to the World Health Organisation (WHO), nearly 20 to 40% of adult population are affected by overweight.⁽¹⁾

In a study conducted in Taiwan by Wang and Lin,⁽¹⁵⁾ the prevalence of overweight was 9.6% among urban bus drivers which is less compared to this study. However, they had also observed an increased prevalence of overweight among bus drivers than the other skilled workers.

Overweight, defined by WHR>1 and waist circumferences>102 cm was seen in significant number of drivers and conductors. A WHR>1 was seen among 21.1%, drivers and 14.1% of conductors. Waist circumference > 102 cm was seen in 23.6% of drivers and 18.1% of conductors. Overweight is an independent risk factor for coronary heart disease (CHD).^(16,17) This occurs both through altered secretion of adipocyte-derived biologically active substances (adipokines) including free fatty acids, adiponectin, interleukin-6, tumour necrosis factor alpha, plasminogen activator inhibitor-1 and through exacerbation of insulin resistance and associated cardiometabolic risk factor.⁽¹⁸⁾

In a study⁽¹⁹⁾ conducted in north of Iran, among urban population aged 20-70 years, the prevalence of overweight was found to be 28.3% which is comparable to this study.

In this study, it was also seen that the prevalence of overweight as well as obesity was higher among drivers compared to the conductors and this difference was statistically significant. Hence, drivers are more prone to develop CHD and metabolic complications. Overweight bus drivers are more likely to become fatigued than non-overweight drivers. As they spend long hours on roads, they put themselves and their road users at risk of road traffic accidents.⁽²⁰⁾

CONCLUSION

Overweight is quite prevalent among bus drivers and conductors, especially more among drivers. BMI is a simple and effective way to screen overweight and obese people. Both WHR and waist circumference are independent tools for measurement of overweight. Timely necessary measures need to be promoted to prevent their progression and complications associated with obesity. Measures to increase physical exercise both at home and at work place should be undertaken, and screening programmes to detect diabetes and hypertension should be undertaken among the overweight study participants.

Recommendations

The control of overweight by weight reduction- this can be achieved by dietary changes both at home and Dhaba (Hotel Road Side), and increased physical activity both at home and at work place should be undertaken.

- a. Dietary Change- The proportion of energy dense foods such as simple carbohydrates and fats should be

reduced; the fibre content in the diet should be increased through the consumption of common un-refined foods with adequate levels of essential nutrients in the low energy diets.

- b. Increased physical activity-Regular physical exercise is the key to increased energy expenditure.

Limitations

Indirect and imperfect measurement does not distinguish between body fat and lean body mass. Increased waist-to-hip ratio can be caused by increased abdominal fat or decrease in lean muscle mass around the hips.

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A STUDY ON THE USE OF COMMERCIAL FEEDING FORMULA AMONGST URBAN CHILDREN: A STUDY FROM KATIHAR DISTRICT OF BIHAR

Prawin Chandra¹, Kashif Shahnawaz²

HOW TO CITE THIS ARTICLE:

Prawin Chandra, Kashif Shahnawaz. "A Study on the use of Commercial Feeding Formula amongst Urban Children: A Study from Katihar District of Bihar". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 39, May 14; Page: 6769-6773, DOI: 10.14260/jemds/2015/291

ABSTRACT: INTRODUCTION: Breast feeding is the best way to feed infant and therefore, every effort should be made to promote and protect this salutary traditional practice everywhere. Commercial Feeding Formula (CFF) is liquid or reconstituted powder fed to infants and growing children. They sometimes serve as substitute for human milk. **OBJECTIVES:** The objectives of our study are to assess the prevalence of the use of CFF among mothers having 6 weeks to 6 months aged children, and to study some factors associated with CFF use. **MATERIALS AND METHODS:** A cross-sectional study was conducted between Dec-2014 to Feb-2015, using a pre-designed, pre-structured questionnaire. A total of 145 mothers having children between 6 weeks to 36 months of age were selected for the study. Interview was done using pre-designed questionnaire. Information regarding the use of CFF with special emphasis on reconstitution of formula food and sterilisation process was obtained. Data, thus collected was compiled and analysed by us. **RESULTS:** In our study, CFF was used by 59.3% of total study subjects. 49.2% of the mothers were using it for under 6 month's children. Maximum 76.6% of the children were between 13-24 months of age. CFF was used by mothers of better education group (80%). Mothers belonging to upper and middle socio-economic strata were more users of CFF, i.e. 100% & 65% respectively, but CFF was also used by maximum proportion of 59.5% by upper lower socio-economic strata. It was also observed in our study that 46.6% of the mothers were diluting the feeding formula improperly and 32.6% unhygienically. Majority of the CFF users were using it as per advice of their relatives and friends (51.1%). **CONCLUSION:** Human breast milk is the best source of nourishment for human infants. Improper reconstitution of CFF is a significant factor affecting nutritional status of children. Generating proper awareness about CFF is must.

KEYWORDS: Breast feeding, commercial feeding formula, urban children.

INTRODUCTION: The Innocent Declaration states "all women should be enabled to practice exclusive breast feeding and all infants should be fed exclusively on breast milk for the first six months of age." Exclusive breast feeding means that no other food or drink should be given to the baby for the first six months.¹ Breast feeding is the best way to feed infants and therefore, every effort should be made to promote and protect this salutary traditional practice everywhere.² Breast milk is still the best nourishment for infants till the age of 6 months. It contains all the essential nutrients for normal growth and development of a baby for the first 6 months. It is least expensive too. In spite of this, unfortunately, commercial feeding formula is being used significantly in urban areas. Commercial Feeding Formulas (CFF) is liquid or reconstituted powder fed to infants and growing children. They sometimes serve as substitute for human milk. CFF becomes inevitable when there is death of mother, prolonged illness of mother, lactation failure, etc. There are many CFF available in India, like powdered formulas, ready to fed liquids, Soya formula, etc.

ORIGINAL ARTICLE

Decreasing breast feeding and increased use of artificial milk are some of the unfavourable trends observed in the upper strata of Indian society, which is probably picked up also by the poor families. Poor infant feeding practices directly or indirectly contribute to under-nutrition, morbidity and mortality in infants. Sometimes, lack of awareness and not poverty per se may be the likely cause of faulty infant feeding practices.³

Successful nursing of infants is dependent not only upon a willing mother and a healthy infant, but also upon various biosocial factors, like increased number of mothers going to work, as a result of mass propaganda that alternative foods are easier to handle, a sense of status symbol or social climbing seems to be associated with the use of formula milk, lack of experience, motivation and support available to urban mothers of nuclear families, getting rid of breast feeding to symbolize the sophisticated women's march towards total emancipation and fear of spoiling the figure and physique during lactation.

Main Objectives of our Present Study are:

1. To assess the prevalence of use of commercial feeding formula among mothers with 6 weeks to 36 months aged children.
2. To study some factors associated with CFF use.

MATERIALS AND METHODS:

Study Design: Cross sectional study.

Study Tools: A pre-designed, pre-structured questionnaire, weighing machine and growth chart.

Techniques: Interview, Measurement

Place of Study: Field practice area of Katihar Medical College, Katihar, Bihar. (Salamat Nagar).

Study Period: Dec-2014 to Feb-2015 (Three months).

Study Population: A total of 145 mothers having children between 6 weeks to 36 months of age.

Study Method: We have gathered information from a total of 145 mothers. The present study was conducted in Salamat Nagar, which is the field practice area of Katihar Medical College, Katihar. Study period was of three months (from Dec-2014 to Feb-2015). A consecutive 145 children between 6 weeks to 36 months of age, their mothers were included in the study. Consent of the mothers was already taken. We interviewed mothers using a pre-designed questionnaire. Information regarding use of CFF with special emphasis on reconstitution of formula food and sterilization process was obtained. The nutritional status of children was assessed using Indian Academy of Pediatrics classification of 'Weight for Age'. Data, thus collected was compiled and analyzed by us.

RESULTS:

Age	Study Subjects	CFF users	
		No.	%
6 weeks-6 months	69	34	49.2
7 months-12 months	37	24	64.8
13 months-24 months	30	23	76.6
25 months-36 months	09	05	55.5
Total	145	86	59.3

Table 1: Age wise distribution of study subjects according to use of CFF

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The table depicts that CFF was used by 59.3% of total study subjects. 49.2% mothers were using it for under 6 month's children. Maximum 76.6% of the children were between 13-24 months of age.

Literacy Status	Study Subjects	CFF users	
		No.	%
Illiterate	45	25	57.7
Primary	39	22	56.4
Secondary	56	35	62.5
Higher Secondary & above	05	04	80
Total	145	86	59.3

From the above table, it's seen that though better-educated group, i.e 80% of the higher secondary and above educated includes more users of CFF, fairly large proportion of less educated mothers, i.e 57.7% illiterate and 56.4% primary educated, respectively, were also using it.

Socio-economic Status	Study Subjects	CFF users	
		No.	%
Upper	03	03	100
Upper middle	40	26	65
Lower middle	46	27	58.6
Upper lower	47	28	59.5
Lower	09	02	22.2
Total	145	86	

Table 3: Socio-economic status of the study subjects using CFF

It is observed from the above table that upper and upper middle socio-economic strata were more users, i.e 100% and 65% respectively, but CFF was also used by maximum proportion of 59.5% by upper lower socio-economic strata.

Nutritional Status	CFF users		CFF Non users		Total
	No.	%	No.	%	
Normal	67	77.9	49	83.1	116 (80)
Grade-I	15	17.5	08	13.6	23 (15.8)
Grade-II	02	2.3	02	3.3	04 (2.7)
Grade-III	02	2.3	Nil	00	02 (1.2)
Total	86	100	59	100	145

Table 4: Nutritional status of children consuming CFF

Among the children using CFF, 77.9% were normal and among CFF non-users, it was 83.1%, whereas 17.5% of the CFF users were suffering from Grade-I malnutrition in comparison to 15.8% of

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the CFF non-users. Only 2.3% of CFF users were suffering from Grade-III malnutrition, but there was none in CFF non-users.

Reconstitution	Number of users	Percentage
Properly diluted	46	53.4
Hygienically prepared	58	67.4

Table 4: Reconstitution of CFF user with correct reconstitution (N=83)

It's observed that 46.6% were diluting the feeding formula improperly and 32.6% unhygienically.

Source	Number	Percentage
TV	13	15.1
Newspapers	02	2.3
Relatives & friends	44	51.1
Health workers	05	5.8
Medical practitioners	26	30.2

Table 5: Distribution of CFF users according to source of advice (N=86)

The above table indicates that majority of the CFF users were using CFF as per advice of their relatives and friends (51.1%) and medical practitioners (30.2%). Television advertisements (15.1%) had also a major share in decision making.

DISCUSSION: Several studies on breast feeding have shown a general decline in breast feeding in urban areas.⁴ It was shown in our study that the use of CFF is 59.3% among urban mothers which is comparable to report of similar study from Haryana.⁵ Educational status and poverty don't have restricted its use. Das and Ahmed,⁶ in their study reported that most of the Bangladeshi rural mothers did not have correct knowledge about exclusive breast feeding. The findings of our study are similar with the findings of Chhabra et al,⁷ who reported that use of CFF had no relationship with education of mothers. Chowdary et al⁸ also reported in their study that literacy status of mothers had no significant relationship with the pattern of breast feeding and the use of CFF adapted by mothers. There is a high prevalence of CFF use by urban mothers even in better educated families (80%) and also in the families from lower socio-economic status, like upper lower (59.5%) and lower (22.2%). The sources of information for CFF use mainly are - relatives and friends (51.1%) and medical practitioners (30.2%). It was also seen that among the CFF users, there is a lack of proper dilution in 46.6% cases and unhygienically prepared CFF was provided to children, in 32.6% cases.

CONCLUSION: Human breast milk is the best source of nourishment for human infants, preventing disease, promoting health and reducing health care costs. The World Health Organisation recommends a minimum of two years of breast feeding and exclusive breast feeding at the first six months of life. Improper reconstitution of CFF is a significant factor affecting the attributes of final product and the situation is still more alarming because of the possibility of use of unclean water and

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holding the reconstituted formula for quite prolonged time at room temperature before use. Moreover, use of unsterilized utensils aggravates the problem. This coupled with excessive dilution of commercial foods and inadequate supplementation predisposes for poor nutritional status, which in turn predisposes for infectious conditions.

RECOMMENDATIONS: There is a need for better use of media for promoting traditional foods for weaning. Generating correct awareness about CFF is must. Better educational status does not guarantee about proper reconstitution. That speaks for implementation of specific educational programs targeting the target groups and general public about proper reconstitution of CFF.

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AUTHORS:

1. Prawin Chandra
2. Kashif Shahnawaz

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Katihar Medical College & Hospital, Katihar, Bihar.
2. Assistant Professor, Department of Community Medicine, MGM Medical College & LSK Hospital, Kishanganj, Bihar.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kashif Shahnawaz,
Manhar Road, Chhoti Quazipura,
District Darbhanga-846004,
Bihar.
E-mail: kashif.shahnawaz99@gmail.com

Date of Submission: 20/04/2015.
Date of Peer Review: 21/04/2015.
Date of Acceptance: 06/05/2015.
Date of Publishing: 12/05/2015.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

AN ASSESSMENT ON THE PREVALENCE OF KALA-AZAR IN MUNICIPAL AREA OF KATIHAR DISTRICT, BIHAR

Prawin Chandra¹, Kashif Shahnawaz²

HOW TO CITE THIS ARTICLE:

Prawin Chandra, Kashif Shahnawaz. "An Assessment on the Prevalence of Kala-Azar in Municipal Area of Katihar District, Bihar". *Journal of Evolution of Medical and Dental Sciences* 2015; Vol. 4, Issue 35, April 30; Page: 6002-6007, DOI: 10.14260/jemds/2015/875

ABSTRACT: INTRODUCTION: Kala-azar is a chronic infectious disease of the reticulo-endothelial system, characterized by irregular fever of long duration, anemia, leucopenia, hepato-splenomegaly and progressive emaciation. It has major medical, psychological, and financial implications and remains a serious public health problem in Bihar. **OBJECTIVES:** To find the prevalence of kala-azar and its associated factors & also to formulate preventive measures for the control of this disease. **MATERIALS AND METHODS:** This was a community based cross-sectional study, conducted in 5 municipal wards of Katihar district, from 1st Jan. 2014 to 31st Dec. 2014. Study population was selected by stratified random sampling method. From each ward families were selected by simple random sampling. After the collection of data using pre-designed and pre-tested Performa, prevalence of kala-azar in municipal area of Katihar district was studied. **RESULTS:** Among the total study population of 2095 people, 1089 were males and 1006 females. Maximum number of cases (60%) in our study was between 20-29 years of age group and 80% of them were males. Sixty percent (60%) of the cases belonged to low socio-economic status and 80% cases occurred in persons living in kutcha houses, where the walls of the room were made of mud. In 80% of the cases, distance of the cattle shed from houses was less than 15 meters. **CONCLUSION:** Young adults are more susceptible to kala-azar and the incidence gradually decline with age. Male preponderance may be due to some practices of adult males like sleeping in the cattle sheds or close to cattle sheds. The high incidence of the disease among low socio-economic group may be due to insanitary habits and surroundings which provide excellent breeding grounds and shelter for the sand fly. **KEYWORDS:** Assessment, Kala-Azar, Prevalance. An Assessment on the prevalence of Kala-azar in municipal area of Katihar district, Bihar.

INTRODUCTION: Kala-azar is a chronic infectious disease of the reticulo-endothelial system, characterized by irregular fever of long duration, anaemia, leucopenia, hepatosplenomegaly and progressive emaciation. The disease is caused by a flagellated protozoan, *leishmania donovani*, injected into the human host by the bite of female phlebotomine sandfly. The vector in India is *phlebotomus argentipes*. In India, man is the only source of infection. Kala-azar can occur in all age groups. Males are affected more than the females. This is a disease of poor and is strongly associated with occupation. Rural population is mainly affected by this disease.

Kala-azar occurs in more than 80 countries in Asia, Africa, Southern Europe and South America with a total of 200 million people at risk (Murray H W,¹ & Guerin P et al.²) Ninety percent of the total estimated new symptomatic cases per year (About 5, 00000) belong to just five countries- India, Nepal, Bangladesh, Brazil and Sudan (Arias J R et al.³) Kala-azar is endemic along the plains of the Ganges and Brahmaputra rivers, i. e in the eastern states of India namely Bihar, Jharkhand, Uttar-Pradesh, Assam & West-Bengal.

An estimated of about 166 million population are at risk in these five states. It is endemic in about 50 districts of these states; however sporadic cases are reported from a few other districts also. Currently about 32 districts out of 38 districts in Bihar especially the ones in the Kosi region, which includes katihar are affected. The disease is confined to rural areas and in people whose socio-economic condition is low and where conditions for the breeding of sand-fly exists. Sand-fly breeds in cracks & crevices in the soil & buildings. Overcrowding, ill-ventilation, accumulation of organic matters in the environment & sleeping on the floor without using fine mesh net around the bed and location of cattle sheds and poultry very near to human dwellings are the risk factors for the transmission of disease.

People who work in farming practices, forestry & mining have greater risk of being bitten by sand-fly. Movement of population between endemic & non-endemic areas can lead to spread of infection. Inadequacy of Kala-azar control programme financed by Govt. of India, absence of an effective vaccine in preventing the disease, failure to abolish the human reservoir, improper vector control, low socio-economic conditions, and increase in population movements have all compounded the already increasing trend to incidence of kala-azar.

We have selected katihar region because people here mainly belongs to the low socio-economic group and sanitation facilities are pitiable. Kala-azar is endemic here. It has major medical, psychological, and financial implications and remains a serious public health problem in Bihar (Ranjan A et al.⁴) Realising the problems of kala-azar to human beings, social and economic burden over society, in the forms of mortality and morbidity, compelled us to carry out this study.

The objectives of our present study were:

1. To find out the prevalence of kala-azar in katihar town.
2. To find out the associated factors of the disease.
3. To formulate preventive measures for the control of this disease.

MATERIALS AND METHODS: This study was a community based, cross-sectional study conducted in Katihar district of Bihar. Duration of study was from 1st Jan. 2014 to 31st Dec. 2014. Study population consisted of 2095 persons in five municipal wards of katihar district, and was selected by stratified random sampling method. From each ward families were selected by simple random sampling, ensuring that the study group in that particular ward comprises at least 10 percent of its population. Initially the proforma was pre-designed and pre-tested and then finalized. After finalization of proforma actual data collection was started.

The baseline information of the families like age, sex, occupation, education, socio-economic status, marital status, source of income, type of family, housing, etc., were collected. The morbidity data was recorded and clinical examinations were carried out. Cases were diagnosed by RK-39 strip test. Age was determined using voter identity card, ration card and an enquiry was also made in case of doubts. Collection of data was done by interview technique, observation, and clinical examination. Data collected was analyzed by applying appropriate statistical methods like percentages, tables.

OBSERVATIONS:

Ward Number	Male	Female
03	230	177
18	234	230
27	172	182
41	255	245
43	198	172
Total	1089	1006

Table 1: Distribution of population according to sex

Table 1 shows ward-wise distribution of the population. The study population was a total of 2095 people, of which 1089 were males and 1006 females.

Age Group (in years)	Number of Cases	Percentage
0-9	00	00
10-19	00	00
20-29	03	60
30-39	01	20
40-49	01	20
50-59	00	00
60-69	00	00

Table 2: Distribution of cases according to age

Maximum number of cases (60%) was between 20-29 years of age group. [Table 2]

Sex	Number of Cases	Percentage
Male	04	80
Female	01	20

Table 3: Distribution of Cases according to sex

Among all the cases of kala-azar, 80% were the males. Male to Female Ratio was 4:1. [Table 3].

Socio-economic status	Number of Cases	Percentage
Group I	00	00
Group II	00	00
Group III	01	20
Group IV	01	20
Group V	03	60

Table 4: Distribution of cases according to socio-economic status

Sixty percent (60%) of the cases belonged to low (Group V) socio-economic status class (classified according to Modified B. G. Prasad Classification). [Table 4].

Type of House	Number of Cases	Percentage
Brick stone wall with thatch roof	01	20
Mud wall with thatch roof	03	60
Thatch roof & thatch wall	01	20

Table 5 shows that 80% of the cases occurred in kutccha house, where walls of the room were made up of mud.

Distance of cattle shed from house	Number of Cases	Percentage
Within 15 meters	04	80
More than 15 meters	01	20

In maximum number of cases (80%), the distance of the cattle shed from houses were less than 15 meters. [Table 6].

DISCUSSION: In the present study five kala-azar cases were detected. In the present series of five cases, the maximum number of cases were observed in the age group 20-29 years (60%). Only 2 cases (40%) above the age of 30 years. No case was found below 19 years [Table 2]. Thakur et al (1978),⁵ and Thakur (1984),⁶ observed two-third of cases between 10 and 29 years age group. The present study shows that the young adults are susceptible to kala-azar and the incidence gradually decline with age.

Current study shows preponderance among males and male: female ratio was 4: 1 [Table 3]. A male preponderance was also observed in studies of Thakur (1978),⁵ Aikat et al (1979),⁷ & Thakur (1984).⁸ C. P Thakur reported in 2000,⁹ that M: F ratio in kala-azar were 4: 1. Naik S R et al,¹⁰ in their series of works also found that males were affected more than the females and the most common age group was 20-30 years. The worker is of the impression that this male preponderance may be due to practices of adult males like sleeping in the cattle sheds or close cattle sheds where a high density of *phlebotomus argentipes* has been reported. Secondly, the dress of Bihari female (Saree) covers most of the body which might be a contributory factor in causing relatively low incidence of disease among them.

Our present study shows a high incidence of kala-azar among the persons of low socio-economic groups. Sixty percent (60%) of the patients were in group V (Lowest socio-economic status) and 20% were in group IV [Table 4]. According to the reports of previous epidemic in Bihar and elsewhere in the country the disease was rare among upper class persons, living in well-built and well ventilated house, but it is very common among poorest class people. Kala-azar patients were poorest of the poor.

The high incidence of the disease among low socio-economic group may be due to the insanitary habits such as collection of garbage, cow dungs in and around the dwelling houses which provides excellent breeding grounds and shelter for the sand fly.

Maximum numbers of cases were found living in house which were made up of mud wall with thatch roof and presence of cracks in the walls of the rooms. In the present study, the houses of 3 cases out of 5 cases were made up of mud wall with thatch roof (60%). The house of one patient was made up with brick/stone wall with thatch roof (20%), while house of another case was made up with thatch wall & thatch roof [Table 5]. C. P. Thakur in 2000,⁹ reported 23% of patients of kala-azar lived in bricked houses, 68% in mud houses, and 9% in grass covered houses. Cracks in mud or stone wall are the breeding places for sandflies. This may be the reasons for the more cases occurrence in houses made up with mud or stone walls. Type of housing affects occurrence of kala-azar.

This study also shows that in 4 cases out of 5 (80%), cattle shed was within 15 meters of their houses, while in only one case (20%), the cattle shed was situated beyond the 15 meters [Table 6]. Cow/cattle dung in and around the houses provides an excellent breeding ground and shelter for the sand flies. This may be the reason for the more cases where distance of cattle shed from house was less.

CONCLUSION: Following conclusions were made from our present study:

1. Maximum number of patients of kala-azar was among 10-29 years of age group (60%).
2. Majority of patients were males (80%). Male: Female ratio was 4: 1.
3. Majority of patients of kala-azar were from low socio-economic group (60% from group V and 20% from group IV of socio-economic class, according to Modified BG Prasad Classification).
4. Sixty percent (60%) of patients were found living in houses which were made up of mud wall with thatch roof.
5. Maximum number of cases occurred with houses near cattle shed within 15 meters (80%).

RECOMMENDATIONS: Following measures should be recommended for the prevention of kala-azar:

1. Though the prevalence of kala-azar is very less in urban area, but in the present study five cases were found among 2095 persons. So, the surveillance of kala-azar is essential in urban area also.
2. Mosquito nets should be used to prevent the insect bite.
3. Breeding grounds such as damp & dark places, specially cracks & fissures in the floors and walls should be eliminated.
4. Insecticidal spray should be undertaken in houses and cattle sheds.
5. Antipoverty and house improvement programmes should be implemented.
6. Information, Education & communication for the awareness of the community regarding prevention of kala-azar should be carried out.

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AUTHORS:

1. Prawin Chandra
2. Kashif Shahnawaz

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Katihar Medical College & Hospital, Katihar, Bihar.
2. Assistant Professor, Department of Community Medicine, MGM Medical College & LSK Hospital, Kishanganj, Bihar.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kashif Shahnawaz,
Manhar Road,
Chhoti Quazipura,
District Darbhanga-846004,
Bihar.
E-mail: kashif.shahnawaz98@gmail.com

Date of Submission: 13/04/2015.
Date of Peer Review: 14/04/2015.
Date of Acceptance: 22/04/2015.
Date of Publishing: 23/04/2015.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

Prevalence of At-Risk Under-Fives and Socio-Demographic Factors Affecting Them- A Cross-Sectional Observational Study

Prawin Chandra¹, Kashif Shahnawaz²

¹Department of Community Medicine, KMC, Katihar, Bihar, India.

²Department of Community Medicine, GMC, Bettiah, Bihar, India.

ABSTRACT

BACKGROUND

Health status of children is an important and sensitive indicator of overall health of entire community. Majority of the illnesses in under-five children can be prevented through available measures. Childhood mortality is distributed in an extremely uneven manner, not only between the regions and countries but also within countries. High child mortality in India is due to multiple factors and their interactions. These determinants include social, economic, biological and demographic factors. Globally, the four major causes of mortality in under-five children are pneumonia, diarrhoeal diseases, pre-term birth complications, and birth asphyxia.

METHODS

A cross-sectional observational study was conducted in Urban Training Health Centre of Katihar medical college, Katihar, Bihar, for 2 months from Feb-2018 to April-2018. Selection of children was done by simple random sampling. Three hundred under five children were selected from the field area to identify ten risk factors. A pre-designed, pre-tested study schedule was used to collect data in which both open and close ended questions were included. Privacy and confidentiality were maintained for mothers of under-five children under present study. Anthropometric and clinical examinations of these children were performed to assess the risk factors under study. Shakir's Tape was used to measure mid-arm circumference and Salter's scale for weight. All data were collected and analysed using Microsoft Excel and Epi Info software 3.4.3. Results were calculated using percentages.

RESULTS

In our present study, thirty percent mothers were illiterate. Most mothers (64%) were housewives. Two-thirds of these children belonged to lower class and 28.6% to upper class families. Nearly 70% children suffered from respiratory infections in the last one year. Acute respiratory tract infections were more common than gastrointestinal infections. Severe malnutrition was observed in 16% children. About 50% children were malnourished.

CONCLUSIONS

Health workers, especially in rural areas should be trained properly, so that they can identify risk factors for under-five children. There should be special provisions of health care facilities for under-five children. Necessary information, education and communication campaigns are needed to decrease infant and under-five morbidity and mortality. It is recommended that there is an urgent need and scope for operationalization of 'at-risk' under-five children through enhancement of staff competence and providing necessary logistic support.

KEY WORDS

Factors, Prevalence, Under-Five Children

Corresponding Author:

Dr. Kashif Shahnawaz,

Associate Professor,

Department of Community Medicine,

Government Medical College, Bettiah,

Bihar, India.

E-mail: kashif.shahnawaz98@gmail.com

DOI: 10.14260/jemds/2020/77

Financial or Other Competing Interests:
None.

How to Cite This Article:

Chandra P, Shahnawaz K. Prevalence of at-risk under-fives and socio-demographic factors affecting them- a cross-sectional observational study. J. Evolution Med. Dent. Sci.2020;9(06):339-342, DOI: 10.14260/jemds/2020/77

Submission 03-10-2019,
Peer Review 16-01-2020,
Acceptance 24-01-2020,
Published 10-02-2020.



BACKGROUND

Under-five children are about 14% of the total population. The health status of these children is an important and sensitive indicator of overall health of entire community. The Global Burden of Diseases 2015 (GBD-2015) found that the worldwide mortality figure among children <5 years of age dropped from 16.39 million in 1970 to 12.1 million in 1990 and 5.8 million in 2015 - a decrease that surpassed predictions. About one-thirds of deaths among children <5 years old occurred in Southern Asia and almost one half in Sub-Saharan Africa.¹ Majority of the illnesses in under-five children can be prevented through available measures. "At-risk" group is a group of individuals having the frequency of risk factors more than other groups.² Due to limited resources all these at risk group of children cannot be given equal attention. So, these 'at-risk' groups should be identified properly, so that we can deliver them efficient paediatric services, because these children contributes largely to perinatal, neonatal, and infant mortality.³

Childhood mortality is distributed in an extremely uneven manner, not only between the regions and countries but also within countries. Socio-economic inequities and gender, to a large degree, determine which children live and which die. There is inequity in child health, which reflects in terms of under-five mortality in the world. The under-five mortality rate is 7, 88, and 120 in the industrialized, developing, and poor countries respectively. The under-five mortality rates in the developing countries are significantly higher among poorest quintile than the richest quintile of the populations. In India, the under-five mortality rates including infant, neonatal, and child mortality rates, started declining since the late 1970s and until 1993 the decline was substantial. High child mortality in India is due to multiple factors and their interactions. These determinants include social, economic, biological and demographic factors.

Globally, the four major causes of mortality in under-five children are pneumonia, diarrhoeal diseases, pre-term birth complications, and birth asphyxia. In developing countries almost 20% of the neonates develop sepsis.⁴ Klebsiella pneumonia and staphylococcus aureus are the most frequently isolated pathogens in septicemia.⁵ In India, acute diarrheal disease is one of the major consequences of not only water pollution but also of the failure of proper management of sewage in both cities and rural areas. The median diarrheal incidence rate ranges from 1.0 to 4.7 episodes per child per year. About 3 million deaths globally are associated with diarrhoea. India alone account for one third of these deaths. Around 65% of these deaths are due to dehydration, 20-35% due to persistent diarrhoea and remaining 15% due to dysentery. Diarrhoea can cause undernutrition and worsen milder forms of malnutrition.⁶ Diarrhoea is the third leading cause of childhood mortality in India, and is responsible for 13% of all deaths/year in children under 5 years of age.⁷ Undernutrition contributes for more than a third of under-five deaths.⁸ Young age, low socio-economic status, poor maternal literacy, birth weight, inadequate breastfeeding, malnutrition, poor sanitation and hygiene practices of the mother, presence of under-five sibling in the family are associated with a higher incidence of diarrheal diseases in young children. Children belonging to poor socio-economic status had a higher diarrheal incidence

than the better socio-economic groups because of many factors like unsafe water, poor sanitation and poor food-hygiene.

This study was conducted to determine the prevalence of at-risk under-five children, and to identify and quantify the effects of different factors affecting them.

METHODS

A cross-sectional observational study was conducted in Urban Training Health Centre of Katihar medical college, Katihar, Bihar, for 2 months from Feb- 2018 to April- 2018, to identify prevalence of at-risk under five children and associated demographic, socio-economic and environmental factors. Sample size taken was 300. By systematic sampling method every 14th house was selected for the study. A pre-designed, pre-tested study schedule was used to collect data in which both open and close ended questions were included. Privacy and confidentiality were maintained for mothers of under-five children under present study. Anthropometric and clinical examinations of these children were performed to assess the risk factors under study. Shakir's Tape was used to measure mid-arm circumference and Salter's scale for weight. All the data were collected and analysed using Microsoft Excel and EPI Info software 3.4.3. Results were calculated using percentages.

RESULTS

	Frequency	Percent
Education of the Father		
Illiterate	36	18.0
Primary school	24	8.0
Middle school	48	16.0
High School	104	34.7
Intermediate	34	11.3
Degree & Above	36	12.0
Education of the Mother		
Illiterate	90	30.0
Primary school	38	12.7
Middle school	46	15.3
High School	84	28.0
Intermediate	24	8.0
Degree & Above	18	6.0
Occupation of the Mother		
Housewife	190	64.0
Daily wager	92	30.0
Vegetable seller	4	1.3
Tailor	10	3.3
Teacher	02	0.7
Engineer	02	0.7
Type of Family		
Nuclear	152	50.7
Joint	148	49.3
Religion		
Hindu	166	55.3
Muslim	64	21.3
Christian	68	22.7
Others	02	0.7
Caste		
Upper caste	86	28.6
Backward Caste	122	40.7
SC & ST	92	30.7
Housing		
Kutchha	22	7.3
Pucca	278	92.7
Socio- Economic Status		
Lower Class	30	10.0
Middle Class	268	89.3
Upper Class	02	0.7

Table 1. Socio- Demographic Profile of Under- Five Children (n=300)

Socio-Demographic Profile (Table 1)

In our present study, thirty percent mothers were illiterate and about 60% of the fathers were having school level education. About 64% of the mothers were house-wives and 30% were on daily wages. Mostly mothers (about 86%) were aged between 20-29 years. More than half of the respondents were Hindus. Two thirds (about 64%) of the study subjects were having family size of less than (or equal to) five members, and nearly half were living in nuclear families. Two thirds of under five children in our study were living in pucca houses.

Under Five Children & Infections (Table 2)

In our present study, about 95% children were of the birth order one or two. About sixteen percent of these children were having birth weight less than 2.5 kilograms. Most of the deliveries (94%) in our study were institutional. About 39% of the mothers were having history of caesarean section. Breast feeding was universal in our study village (about 95%). Nearly 70% under-five children suffered from respiratory infections, but only 13% suffered from at least one episode of gastro-intestinal infection during past one year

	Frequency	Percent
Birth Order		
1	144	48.0
2	140	46.7
3	12	4.0
4	04	1.3
Birth Weight (in Kilograms)		
> 3.2	54	18.1
2.5- 3.2	196	65.2
2-2.49	46	15.4
<2	04	1.3
Place of Delivery		
Institutional	282	94.0
Home	18	6.0
Delivery Method		
Normal Delivery	184	61.3
Caesarean Section	116	38.7
Type of Feeding		
Breast milk	284	94.7
Artificial Feeds	12	4.0
Both	04	1.3
Time taken to Start Breast Feeding		
<1/2 Hour	38	12.7
1/2- 1 Hour	74	24.7
<1-3Hours	120	40.0
>3- 6 Hours	42	14.0
After 6 Hours- 1Day	02	0.7
>1 day	12	4.0
Not given	12	4.0
Recurrent ARI in Last 1 Year		
No Episodes	94	31.3
≤ 3 Episodes	182	60.7
>3-5 Episodes	20	6.7
>5 Episodes	04	1.3
Gastrointestinal Infections in Last 1 Year		
No Episode	248	82.7
1 Episode	40	13.3
2 Episodes	08	2.7
≥ 3 Episodes	04	1.3

Table 2. Profile of the Under-Five Child (n=300)

Nutritional Status (Table 3 & 4)

In our present study, one third of the under-five children were having mild to moderate malnutrition, and severe malnutrition were observed in 16% children. Nearly one-

thirds (34.7%) under five children were above 100% of the reference standard, and 6.8% below 70%.

	Frequency	Percent
Normal	152	50.7
Mild to Moderate Malnutrition	100	33.3
Severely Malnutrition	48	16.0

Table 3. Nutritional Status based upon Mid- Upper Arm Circumference (n=300)

Weight for Age	Frequency	Percent
<70%	20	6.8
71-80%	40	13.6
81-90%	51	17.0
91-100%	84	27.9
>100%	104	34.7

Table 4. Nutritional Status Based upon Weight for Age (n=300)

Prevalence of 'At-Risk' Factors (Table 5)

Our present study shows that about sixty-three percent of the under-five children are at-risk for two or more factors.

	Frequency	Percent
No Risk factor	72	24.0
1 Risk factor	38	12.7
2 Risk factors	120	39.3
3 Risk factors	54	18.0
>3 Risk factors	18	6.0

Table 5. Risk Factor Prevalence (n=300)

DISCUSSION

In our study, literacy of the fathers of under-five children were high (82%), as compared to their mothers (60%). Mittal A, et al⁷ found 70.75% literacy rate in Patiala, Punjab. There was a significant association between educational status of parents and the number of 'at-risk' children. It was seen that the number of 'at-risk' children decreases with the increased level of education of parents. Maternal primary education has direct impact on child mortality. Mondal et al⁹ in his study found risk of child mortality decreased with increased female education. Majority of the families belonged lower class. Aswar et al¹⁰ in their study found that statistically significant association was present between at-risk children and poverty. Wagstaff A.¹¹ et al shown that low socio-economic families are at more risk of childhood morbidities, because of poor sanitation facilities and practices available in these families. In a 2016 publication that examined how specific diseases and injuries are affected by environmental risk, the WHO estimated that 23% of all deaths and 26% of deaths among children <5 years of age were due to modifiable environmental factors: some 1.7 million children die every year from causes related to unhealthy environments, including the more than 3, 60, 000 deaths stemming from a lack of access to clean water and sanitation.

Nearly 70% of the under-five children suffered from respiratory infections, but only 13% of them suffered from gastro-intestinal infection during the past one year. Housing has strong association with infections. A properly ventilated house is protective against many respiratory infections. Sharma et al, found that housing, overcrowding and ventilation were significantly associated with respiratory and gastro-intestinal infections in under-five children.

In our present study, one third of the under-five children were having mild to moderate malnutrition, and severe

malnutrition were observed in 16% of study subjects. Nearly 6.8% of the under-five children were below 70% of the reference standard. Aswar et al¹⁰ and Bhasin et al,¹² in their study also found weight for age less than 70% as the most common risk factor in their respective studies, i.e., 39% and 40.5% respectively. Jelliffe concluded from his study that diarrhoea may be an important contributing factor leading to malnutrition.

CONCLUSIONS

All risk factors for under-five children should be identified and health workers, especially in rural areas should be trained properly, so that we can deliver better services. There should be special provisions of health care facilities for under-five children. Proper training of health care providers and education- and communication-campaigns are need of the hour to decrease the infant morbidity and mortality.

Recommendations

There is an urgent need for enhancement of staff competence and providing necessary logistic support. The detailed criteria for screening children, especially under-five, 'at-risk' should be developed, agreed and disseminated among the health care providers for early diagnosis, treatment and specialized care.

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Study of Prevalence of Hypertension and its associated risk factors among adult tribal population (18 years and above) in a rural community of Katihar District, Bihar

Authors

Dr Urmi Poddar¹, Dr Prawin Chandra^{2*}, Dr Sahid Iqbal³

¹Medical officer incharge, PHC Mansahi, Katihar

^{2,3}Associate Professor Department of Community Medicine, Katihar Medical College, Katihar

*Corresponding Author

Dr Prawin Chandra

Associate Professor Department of Community Medicine, Katihar Medical College, Katihar, India

Abstract

Background: *The size of elderly segment of population is increasing in developing countries as the latter undergo a demographic transition with a concomitant increase in life expectancy. Indeed, it is estimated that by the year 2025 the majority of the people worldwide will reside in developing countries. Developing countries are thus likely to face an enormous burden of chronic non communicable disease in the near future. Of these diseases, hypertension is one of the most important treatable causes of mortality and morbidity in the elderly population. Studies have shown that tribal population in India are also experiencing this burden.*

Objective: *To measure the prevalence of hypertension and identify its risk factors.*

Methods: *A community based cross-sectional study was conducted in 1800 tribal population of 18 years and above in three tribal villages under Uttari Simaria of Korha block, Katihar.*

Result: *In 1800 population 51.7% were male and 48.3% were female. The Overall prevalence of hypertension was found 14.8%. in which 16.3% were males and 13.1% were females. Prevalence of hypertension was found greater in people taking non-vegetarian diet 18.1%.*

Conclusion: *Appropriate knowledge intervention strategies need to be adopted to increase awareness and treatment practices of hypertension among tribals.*

Keywords: *Prevalance, Hypertension, Non-Communicable Disease, Tribals, Awareness, Treatment.*

Introduction

The Framingham Study conducted in the USA showed that the higher levels of blood pressure were related to higher rates of mortality from Coronary Heart Disease (CHD) and stroke.¹ Lauridsen and Gyntelberg (1979) found that 75% of hypertensive persons had major cardiovascular complications.²

The study conducted in the urban population of Siliguri, West Bengal showed that Ischemic Heart A number of randomized control trials in developed countries have establishment of high blood pressure in the elderly population significantly reduces cardiovascular morbidity and mortality.^{3,4,5,6} Several community based investigations have served to emphasize that hypertension is rapidly emerging as a major health

problems also in developing countries.⁷ As per estimates, the number of person with hypertension in India will nearly double from 118.2 million in 2000 to 213.5 million in 2025.⁸ Disease (IHD) was significantly associated with hypertension.⁹ The concept of normal and raised blood pressure is a widely discussed phenomenon and views do not quite agree with each other. Sir George Pickering started that the dividing line between “normotension” and “hypertension” is nothing more than artefact.¹⁰ Pickering stated also that essential hypertension is a quantitative deviation from the norm and hence the difference between hypertension and normotension is one degree and not of kind.¹¹ Sir George Pickering first formulated a concept that blood pressure in a population is distributed between normotension and hypertension.¹²

World Health Organization (WHO)-International Society Of Hypertension (WHO-ISH) defined hypertension as either a systolic Blood Pressure as either a Systolic Blood Pressure ≥ 140 mmHg and /or treatment with anti-hypertensive medications.¹³ In some developed countries, up to 25% of adults have diastolic pressure above 90mmHg.¹⁴ In developing countries the prevalence of hypertension varies from 10% to as much as 20% among adults.¹⁵

In India in a well planned study (1978) the prevalence of hypertension was found as 5.9 and 6.9 percent in males and females respectively in urban population (20-60years) of Rohtak.¹⁶ In another study (1977) conducted in a village of Haryana the prevalence of hypertension was observed as 3.5 and 3.59 percent in males and females respectively.¹⁷ It is estimated that 21% of Indians have raised blood pressure (2014).¹⁸ Several Community based studies in India have estimated the prevalence of hypertension in urban as well as rural areas. The meta analysis of eight studies carried out gives a pooled prevalence rate of 164.2 per thousand in urban areas that hypertension is present in 25% urban and 10% rural subjects in India.¹⁹ In a rural community of Varanasi district the prevalence of hypertension

was found to be 7.19 percent.²⁰ Study conducted in a rural area of J&K state, India the overall prevalence of hypertension was observed as 8.31 percent.²¹

In a study conducted among tribal labour population in Gujarat the prevalence of hypertension was found to be 16.9%.²² However a study among tribal “Oraon” population of Orissa revealed lower prevalence of hypertension-4.6/1000 population.²³ In contrast a study among primitive tribes of Orissa reported prevalence of hypertension among males and females as 31.8 and 42.2 percent respectively.²⁴ A study was undertaken among aboriginal Nicobarese tribe living in Car Nicobar Island, India has documented high prevalence of hypertension 50.5%.²⁵ Epidemiological study carried out among the Lepchas of Sikkim has documented hypertension prevalence of 31.9% among rural males and 25.0% among rural females (by using older WHO criteria for hypertension).²⁶

Aims and Objective

1. To determine the prevalence of hypertension in a tribal population of age 18 years and above in rural community.
2. To examine the impact of the various known risk factors responsible for variations of blood pressure (18 years and above) of tribal population in a rural community.

Material and Method

A community based cross sectional study will be carried out in a tribal population of 18years and above in three tribal villages under Uttari Simaria GP of Korha block, Katihar district, Bihar during 2017. These villages with tribal population are situated in the rural field practice area of Katihar Medical College, Katihar.

On the basis of that prevalence of hypertension the sample size of the present study adopting the formula

$$n = \frac{Z^2 \alpha / 2 \times PQ}{\Sigma^2}$$

Results

Table I Age and Sex Distribution

Age In Years	Male	Female	Total
18-29	170(9.4%)	192(10.7%)	362(20.1%)
30-39	135(7.5%)	162(9%)	297(16.5%)
40-49	198(11%)	172(9.6%)	370(20.6%)
50-59	254(14.1%)	191(10.6%)	445(24.7%)
≥60	174(9.7%)	152(8.4%)	326(18.1%)
Total	931(51.7%)	869(48.3%)	1800(100%)

Table 2 Age wise prevalence of hypertension in study subjects

Age in Years	Hypertensive	Normotensive	Total
18-29	31(11.6%)	262(17.1%)	293(16.3%)
30-39	38(14.3%)	297(19.4%)	335(18.6%)
40-49	55(20.7%)	352(22.9%)	407(22.6%)
50-59	63(23.7%)	356(23.2%)	419(23.3%)
≥=60	79(29.7%)	267(17.4%)	346(19.2%)
Total	266(100%)	1534(100%)	1800(100%)

Table 3 Sex-wise prevalence of hypertension in study subjects

	Hypertensive	Normotensive	Total
Male	157 (16.3%)	809 (83.7%)	966(53.7%)
Female	109 (13.1%)	725(86.9%)	834(46.3%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Table 4 Showing prevalence of hypertension as per Salt Intake among study subjects

Salt Intake	Hypertensive	Normotensive	Total
Extra Salt(>5gm/dl)	74(35.1%)	137(6.5%)	211(11.7%)
Normal Salt	182(11.6%)	1407(88.5%)	1589(88.3%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Table 5 Showing prevalence of Hypertension among study population as per dietary habit

Group	Hypertension	Normotensive	Total
Vegetarian	37(6.9%)	496(93.1%)	533(29.6%)
Non-Vegetarian	229(18.1%)	1038(81.9%)	1267(70.4%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Table 6 Showing prevalence of hypertension among study population with habit of chewing tobacco

Tobacco Chewing	Hypertensive	Normotensive	Total
Yes	208(45.8%)	246(54.2%)	454(25.2%)
No	58(4.3%)	1288(95.7%)	1346(74.8%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Table 7 Prevalence of Hypertension in Smokers

Smoking	Hypertensive	Normotensive	Total
Yes	161(46.8%)	183(53.2%)	344(19.1%)
No	105(7.2%)	1351(92.8%)	1456(80.9%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Table 8 Prevalence of Hypertension in Alcoholic

Alcoholic	Hypertensive	Normotensive	Total
Yes	183(19.9%)	735(80.1%)	918(51%)
No	83(9.4%)	799(90.6%)	882(49%)
Total	266(14.8%)	1534(85.2%)	1800(100%)

Discussion

In the present study, Table 1 shows that the percentage distribution of age in male and female participations, maximum number of males was in the age group of 50-59 years and female were in the age group of 18-29 years and for convinence persons aged 60 years and above have been grouped in a single category. Table 2 shows age wise prevalence of hypertension it is seen that 266 persons are found hypertensives we also observe that the percentage of hypertensive subjects was found to be minimum in the age group 18-29 years (11.6%) and maximum in the age group 60 and above (21.7%), as the age increases the percentage of hypertension also increases. Table 3 Sex-wise prevalence of hypertension in study subjects, we can observe that the percentage of hypertension was found to be more in males (16.3%) as compared to females (13.1%). Table 4 Showing prevalence of hypertension as per Salt Intake among study subjects shows that we can observe that the percentage of hypertension was found more on subjects taking extra salt 35.1%. Table 5 Shows prevalence of Hypertension among study population as per dietary habit shows we can observe that the maximum percentage of hypertension was found to be maximum in subjects taking non-vegetarian diet 18.1%. Table 6 shows prevalence of hypertension among study population with habit of chewing tobacco, we can observe that the maximum percentage of hypertensive subject was found in tobacco chewing 45.8%. Table 7 shows Prevalence of Hypertensives in smokers shows we can observe that the percentage of hypertensives among

smokers in 46.8%. Table 8 Prevalence of Hypertension in Alcoholic shows we can observe that the percentage of hypertensives subjects who are alcoholic are 19.5%.

Summary and Conclusion

Hypertension is the commonest cardiovascular disease, posing a major public health challenge to the societies in socio economic and epidemiological transition. India, undergoing this transition is burdened with problem of increasing prevalence of hypertension especially in rural areas. Although traditional population around the world were often believed to have low blood pressure, gradually with changing socioeconomic environment, marked increase in blood pressure has not been noted. Tribal populations are more vulnerable as they live in difficult or remote areas with lack of proper health facility and poor health seeking behaviour. With this objective, a cross-sectional study was conducted to find the prevalence and associated risk factors of hypertension in adults (>18 years) in rural tribal population.

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A CROSS SECTIONAL STUDY OF KNOWLEDGE, ATTITUDE AND PRACTICES ON IMMUNIZATION OF CHILDREN IN HAJIPUR, KATI HARShahid Iqbal¹**HOW TO CITE THIS ARTICLE:**

Shahid Iqbal. "A Cross Sectional Study of Knowledge, Attitude and Practices on Immunization of Children in Hajipur, Katihar". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 54, July 06; Page: 9370-9374, DOI: 10.14260/jemds/2015/1360

ABSTRACT: A cross-sectional study was conducted to estimate and to compare immunization coverage and to understand reasons of partial/ un-immunization among children. A total of 110 children between 1-5 years of age were interviewed in 11 clusters consisting 10 children from each cluster (five from each group) by expanded program on immunization cluster survey method. Statistical analysis was performed with proportions, their 95%, confidence intervals, chi-square test, and binary logistic regression. Full immunization coverage rate was 40% and 60% was partially immunization and 10% was un-immunization. Reasons cited for un-immunization/partially immunized were, place or time of vaccination not known, unavailability of immunization services at site, inconvenient time of sessions, unaware of need for vaccination etc. Thus full immunization coverage rate was significantly lower among children.

KEYWORDS: Immunization Status, Perception of parents or guardian, Source of information.

INTRODUCTION: Global Immunization vision and strategy sets a goal of protecting more people against more diseases by expanding the reach of immunization to every eligible person. Identifying and reaching the unreached people in every district is one of the key strategies to achieve this goal.¹ Immunization is one of the best indicators to evaluate the health. It is also one of the most cost effective interventions to prevent a series of major illness, particularly in environments where children are under nourished and die from preventable diseases.

Immunization of a new born with BCG vaccine enhances with a typical Mycobacterium which can infect the child during the post neonatal period.² Likewise, administration of "0 dose" of OPV leads to early colonisation of the intestinal tract with the attenuated vaccine virus which can act as a barrier to the wild Polio virus.³ The Janani suraksha Yojna (JSY) is an ambitious step under NRHM which is introduced on 12th April 2005 to reduce Neonatal and maternal mortality by promoting institutional deliveries as well as better ante natal care and post natal care through Accredited social Health Activist.⁴ At birth immunization is a important preventive measure however the impact of JSY scheme on at birth immunization practice especially in tertiary level health centre has not been documented. Institutional deliveries will not only facilitate safe delivery but will also identify neonates who need special care. The safe delivery process conducted in an institution will have a definite impact of reduction of maternal mortality. Delivery of a new born in an institution also provides an opportunity to the health care system to administer at birth immunization. Immunization coverage did not differ by the gender of child which was similar to other studies.^{5,6,7} We found father's education an independent determinant in both groups. Educated males have better social networks. Likelihood of partial immunization was found to be more in home delivered children; similar findings were reported by other workers.^{8,9}

Lack of information about place/time of immunization sessions, inconvenient timing and unavailability of services at the site were common reason for immunization. In routine immunization

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program outreach sessions are held in villages with the help of support group involving Aganwari workers and ASHA however, these workers, Labourers usually live in the vicinity of factories which are usually located outside the village or town also their work schedule starts from 8 A.M to 4 P.M which makes access to outreach session of that particular village inconvenient in place and time.

The extensive social benefits of immunization, any inequities in the knowledge, attitude and practices that leave out large sections of the most deprived populations are a cause of serious concern. The study was cross sectional one and the data was collected by a predesigned schedule from the parents of all the babies attending the immunization.

METHODOLOGY: A cross sectional study design, 110 sample size, structured questionnaire tool study, 16 August 2014 to 2nd Sept. 2014 study period at Rural Health Training Centre Hajipur of Katihar Medical College Katihar Bihar.

Immunization status, literacy of parents or guardian, religion, occupation, source of information and sex of the child are the study variables.

A community based, cross sectional study was conducted in RHTC HAJIPUR, KATI HAR. All children aged 1-5 years were included in the study. A Structured questionnaire was used to elicit the information about the knowledge, attitude and practices of the respondents regarding immunization.

OBSERVATION AND RESULT:

Immunization	Number	Percentage
Fully Immunization	40	36.36%
Partially Immunization	60	54.54%
Un-immunization	10	9.10%
Total	110	100.00%

Table 1: Immunization out of 110

Present Study 36.36% (40) was fully immunized and 54.54% (60) were partially immunized and 9.10% (10) were unimmunized.

1. Motivator for at birth immunization	No.	Percent
ASHA	63	57.27%
ANM/AGANWADI WORKERS	30	27.27%
FAMILY MEMBERS/ SELF AWARE	10	9.10%
OTHERS/MASS MEDIA	07	6.36%
TOTAL	110	100.00%
2. Vaccine given at birth	No.	Percent
BCG	30	27.27%
OPV	60	54.55%
Hep-B	10	9.09%
Don't know	10	9.09%
Total	110	100%

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3. At birth immunization prevents	No.	Percent
Tuberculosis	10	9.09%
Polio	60	54.55%
Hepatitis B	10	9.09%
Don't know	30	27.27%
Total	110	100%

Table 2: Perception of parents on at birth immunization

In present study table (2) motivator for at birth immunization 57.27% by ASHA, 27.27% By ANM/AGANWADI workers, 9.10% by family members or self-aware, 6.36% by mass media or other sources.

Vaccine given at birth 27.27% of BCG, 54.55 of OPV, and 9.09% Of Hep-B, 9.09% of cases don't know about Immunization.

Prevents disease by immunization at birth 9.09% of know about Tuberculosis, 54.55 about Polio, 9.09% about Hepatitis B, 27.27 of cases don't know anything.

DISCUSSION: From a total of 110 studied child 36.36%, (n=40) were fully immunized, 54.54% (n=60) were partially immunized and 9.10% (n=10) were unimmunized.

Health workers (ANM, ASHA, AWW) were the main source of information (84.54%), followed by family members and relatives (10%), through mass media (07%), A large proportion of the children (75%) had received their immunization from government establishments while 16% from private clinics including RHTC Hajipur KMC. Majority of the respondents (72.73%) opined that diseases could be prevented by immunization.

Most cases are from rural areas as it is a tertiary level health care, the patients from nearby areas are referred to the hospital, ASHA'S do work of community mobilization and motivation, similar studies by Huang J and Tembo KC have found that provision of services alone cannot raise the need and utilization of services unless their motivation.^{10,11}

In states like Tamil Nadu and Kerala awareness about maternal health issue is high and citizens demand more. Literacy also plays a key role in rendering maternal health services.¹² As reported by Kusuma et al., low uptake of immunization can be attributed to workers, vulnerability, marginalization and alienation in the new socio cultural environment.¹³ Antai has reported that the likely hood of full immunization for children is associated with the disruption itself.⁶ Parents everywhere share the vulnerability resulting from limited social network, alienation and lively hood insecurity^{5,6,14} therefore findings of this study are important and can be generalized for areas from where there is a large scale seasonal work, thus, this study shows that seasonal significantly reduces full immunization coverage rate and highlights necessity of health services package specifically for labourers and workers at a convenient site and timings.

Most of attendants of children had positive attitude toward vaccination which reflect a higher significance for complete and partial immunization. The negative attitude (As fear from vaccination and some false beliefs) played a highly significant role in importing knowledge to partial immunized group. The main reason for partial and non-immunization was found to be lack of information and lower education status.

CONCLUSION: Monetary benefits of social workers mainly ASHA is the main factor which brings people for at birth immunization, not the vaccines which prevent the disease. Therefore, steps to create social mobilization among the community to avail not only the benefits but also objectives should be immediately taken up. The innovative engagement of human resources as per need and the arrangements for incentives at each level will help to build up a role model of public health delivery system.

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ORIGINAL ARTICLE

AUTHORS:

1. Shahid Iqbal

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Katihar Medical College.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Shahid Iqbal,
Assistant Professor,
Department of Community Medicine,
KMCH, Katihar.
E-mail: shahidiqbalkmc@gmail.com

Date of Submission: 11/06/2015.

Date of Peer Review: 12/06/2015.

Date of Acceptance: 29/06/2015.

Date of Publishing: 03/07/2015.

A CROSS SECTIONAL STUDY OF NUTRIENT INTAKE AMONGST RURAL ADOLESCENT GIRLS OF KATI HAR

Shahid Iqbal¹, Rashid Ahmad Khan²

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

ABSTRACT

OBJECTIVE

A cross sectional study of the nutrient intake of rural adolescent girls was carried out in four villages of the Department of Community Medicine, Katihar Medical College, Katihar.

MATERIALS AND METHODS

A household survey was carried out in the villages. A list of all the adolescent girls in the age group of 10-19 years was prepared by enumeration through house to house visit. All adolescent girls were included in the study. A predesigned and pretested questionnaire was used to collect data on socio-demographic variables and anthropometric variables. A 24-hour recall method was used to assess nutrient intake. Data generated was entered and analysed using epi info 2000. Nutrient intake was compared with ICMR Recommended Dietary Allowances (RDA). Nutritional status was assessed by BMI for age.

OBSERVATIONS

The mean height of the adolescent girls was 142.9 cm. Overall, 57% of the adolescents were thin (BMI full age <5th percentile far CDC 2000 reference) and 43% of the adolescents were normal (BMI for age between 5th - 85th percentile for CDC 2000 reference). The average energy intake which was 1239.6±176.4 Kcal/day was deficient of RDA by 39.1%. The average protein intake was 39.5±7 gm/day. It was deficient by 36.1% and the average iron intake, which was 13.2±2.5 mg/day was deficient by 48.2%.

CONCLUSION

The findings reiterate the dietary deficiency among adolescent girls, which adversely affects the nutritional status. If the poor nutritional status is not corrected promptly before they become pregnant, it adversely affects the reproductive outcome. If we have to meet out the goals of reproductive and child health programme intervention strategies to improve the dietary intake of adolescent girls are needed so that their requirements of energy, protein, vitamins and minerals are met.

KEYWORDS

BMI, Calorie, Dietary Recall, Iron, Protein.

HOW TO CITE THIS ARTICLE: Iqbal S, Khan RA. A cross sectional study of nutrient intake amongst rural adolescent girls of Katihar. J Evolution Med Dent Sci 2016;5(4):253-255, DOI: 10.14260/jemds/2016/53

INTRODUCTION

There are nearly one billion adolescents in the world accounting for 20-25% of the total population in the developing countries. This particular group of population is likely to increase rapidly in the next 30 years due to population momentum effect.⁽¹⁾ owing to sudden and special growth taking place in this phase, the nutritional requirements also increase tremendously compared to preceding years of growth. During this phase, diet should provide not only sufficient calories, but also essential elements and nutrients such as protein, vitamins and minerals required for growth.

Nutrition is an input to the foundation of health and development. Better nutrition is a prime entry point to ending poverty and a milestone to achieving better quality of life.

Freedom from malnutrition is a basic human right and their alleviation is a fundamental prerequisite for human and national development.

Malnutrition is associated with significant morbidity, mortality and economic costs in developing countries.⁽²⁾ It also affects the reproductive outcome of the mother. Interventions which targeted pregnant mothers failed to improve the reproductive outcomes and there is an urgent need to improve the nutritional status before a woman becomes pregnant.⁽²⁾ To design appropriate strategy to tackle the poor nutrition among adolescent girls and eventual morbidity and mortality, it is essential to study the dietary pattern. Hence, the present study was under to know the nutrient intake among adolescent girls of rural Katihar.

MATERIAL AND METHODS

A cross sectional study was carried out in the four adopted villages such as Hajipur, Chapada, Bompada, Field Tola during January 2014 to June 2014 of the Department of Community Medicine, Katihar Medical College Katihar.

A household survey was carried in all the four villages to enumerate unmarried adolescent girls in the age group of 10-19 years. All the adolescent girls were included in the study. A predesigned and pre-tested questionnaire was used to collect data on socio-demographic and anthropometric variables.

Financial or Other, Competing Interest: None.

Submission 11-10-2015, Peer Review 12-10-2015,

Acceptance 07-01-2016, Published 13-01-2016.

Corresponding Author:

Dr. Shahid Iqbal,

Assistant Professor,

Department of Community Medicine,

Katihar Medical College,

Katihar.

E-mail: shahidiqbalkmc@gmail.com

DOI:10.14260/jemds/2016/53

A 24-hour recall method was used to assess nutrient intake. The nutrient intake was calculated using tables of nutritive value of Indian foods.⁽³⁾ Data generated were entered and analysed using epi info 2000. The CDC 2000 reference was used to assess the nutritional status.⁽²⁾ The Chi-square test was used for testing statistical significance. The level of significance was taken at P Value <0.05.

OBSERVATION

Adolescent unmarried 430 girls enumerated, participated in the study. In present study 57% of the adolescent girls were thin and 43% were normal. None of them were overweight or

obese. The prevalence of thinness was significantly higher 67.6% in early adolescence than in late adolescence 55.4%.

The adolescent girls (82.5%) had calorie intake less than 1400Kcal; 7.5% girls had calorie intake less than 1000Kcal. The average energy intake was 12.39±176.4Kcal/day. The calorie intake of adolescent girls was less than the Recommended Dietary Allowance (RDA) for their age. The average calories intake was deficient by 39.1%. The average protein intake was 39.5±7mg/day, which was deficient by 36.1%. The average iron intake was 13.2±2.5mg/day and was deficient by 48% [Table].

Table Nutrient Intake of Adolescent Girls												
NUMBER NUTRITIONAL CALORIE (KCAL/DAY) PROTEINS IRON												
Status * BMI for Age												
AGE (Years)	<5 TH	5 TH - 85 TH	RD**	MEAN INTAKE ISD	% DEFICIT ***	RD A	MEAN INTAKE ISD	% DEFICIT	RDA	MEAN INTAKE ISD	% DEFICIT	
10	35	25 (71.4)	10 (71.4)	1970	1130.08±13.0	42.6	57	35.8±6.1	37.2	19	11.52±2.1	39.3
11	40	30 (75.0)	10 (25.0)	1970	1177.1±1989	40.2	57	38.5±7.3	32.4	19	12.85±2.7	32.3
12	50	34 (68.0)	16 (32.0)	1970	1208±163.3	38.7	57	39.2±6.6	31.3	19	12.96±2.4	31.7
13	52	34 (65.4)	18 (34.6)	2060	1224.1±149.6	40.5	65	38.1±5.4	41.3	28	12.81±1.9	54.2
14	40	24 (60.0)	16 (40.0)	2060	1244.5±173.6	39.6	65	38.8±6.9	40.1	28	13.39±2.3	52.1
15	50	24 (48.0)	26 (52.0)	2060	1282.1±169.2	37.8	65	40.9±7.0	36.9	28	13.90±2.5	55.3
16	47	23 (48.9)	24 (51.1)	2060	1243.6±159.5	39.6	63	39.4±5.9	37.4	30	13.24±2.2	55.8
17	49	23 (46.9)	26 (53.1)	2060	1322.6±183.4	35.8	63	42.3±7.8	32.8	30	13.98±2.7	53.4
18	34	17 (50.0)	17 (50.0)	2060	1260.8±1954	38.0	63	40.4±8.4	35.8	30	13.68±2.6	54.4
19	33	11 (33.3)	22 (66.7)	2060	1284.1±179.4	37.6	63	40.6±7.2	35.5	30	13.97±2.4	53.4
TOTAL	430	245 (57.0)	185 (43.0)	-	1239.6±176.4	39.1	-	39.5±7.0	36.1	-	13.2±2.5	48.2

* None of the participant had BMI for Age > 85th percentile ** RDA (Recommended Dietary Allowances)
 *** Percentage deficit in recommended intake

DISCUSSION

During adolescence poor nutritional status is an important determinant of health outcomes. Short stature in adolescents resulting from chronic under nutrition is associated with reduces lean body mass and deficiencies in muscular strength and working capacity. In the present study, 57% of the adolescents were thin while 43% were normal.

The high prevalence of thinness is reported from the developing world. National Nutrition Monitoring Bureau.⁽⁴⁾ also showed that the height, weight and growth rates of adolescents of low income groups were about 70-80% of those of well to do adolescents. Choudhari et al.⁽⁵⁾ reported that 68.52% of the adolescents had BMI less than 18.5 in rural area of Varanasi. In the present study, thinness was significantly higher in early adolescence (67.64%) than in late adolescence (55.42%), Deshmukh et al.⁽⁶⁾ reported that majority (53.8%) of the adolescents were thin, only 2.2% were overweight while 44.0% were normal. Medhi et al.⁽⁷⁾ reported that 41.3% of the adolescent girls were thin.

In the present study, the average energy intake was 1239.6±176.4Kcal/day and the calorie intake was deficient by 39% Chaturvedi et al.⁽⁸⁾ reported that the calorie intake was deficient by 36%, 34% and 26% in the age group 10-12 years, 13-15 years and 16-18 years respectively. Yadav and Singh.⁽⁹⁾ reported that the calorie deficiency among adolescents was 29%.

The average protein intake was 39.5±7mg/day and the protein intake was deficient by 36%, Chaturvedi et al.⁽⁸⁾ reported that in the age group 10-12 years, 13-15 years and 16-18 years, the protein deficit was 29%, 32% and 23% respectively. Yadav and Singh.⁽⁹⁾ reported that the magnitude of stunting was 60% among the adolescents.

The average iron intake was 13.2±2.5mg/day and was deficient by 48.2%. Butley.⁽¹⁰⁾ found that the mean iron intake was 7±3.1mg in the age group of 14-16 years in low socio-economic status, while in upper socio-economic status it was 18.5±5.2mg. She also observed that in the age group of 17-18 years, the mean iron intake was 10.1±3.1mg in lower socio-economic status and in upper socio-economic status it was 24.13.7mg. Earlier diet surveys in adolescent population have also shown that the diets are inadequate in all nutrients including iron, proteins, calcium and calories.⁽¹¹⁻¹³⁾ Similar findings were also reported by Reddy.⁽¹⁴⁾ and Vasanthi et al.⁽¹⁵⁾

CONCLUSION

The findings reiterate the dietary deficiency among adolescent girls which adversely affects the nutritional status. If the poor nutritional status is not corrected promptly before they become pregnant, it will adversely affect the reproductive outcome. If we have to meet out the goals of reproductive and Child Health Program, intervention strategies to improve the dietary intake of adolescent girls are needed so that their

requirements of energy, protein, vitamins and minerals are met.

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MENSTRUAL HYGIENE: A STUDY AMONG RURAL ADOLESCENT GIRLS IN KATI HAR.

Community Medicine

Dr Rashid Ahmad Khan

Assistant Professor, Department Of Community Medicine, Katihar Medical College

Dr Arun Kumar Pandey*

Assistant Professor, Department Of Community Medicine, Katihar Medical College
*Corresponding Author

Dr Soni Rani

Post Graduate Trainee, Department Of Community Medicine, Katihar Medical College

ABSTRACT

BACKGROUND: Menstruation is an important milestone event in a girl's life with the beginning of reproductive life. Still, menstruation and menstrual practices are clouded by taboos and socio-cultural restrictions, particularly in rural areas leading to ignorance of adolescent girls regarding menstrual hygiene practices and its scientific facts.

AIMS AND OBJECTIVES: 1. To find out status of menstrual hygiene practices among adolescent girls. 2. To find out association between different socio-demographic factors and menstrual hygiene.

MATERIAL AND METHOD: A cross sectional study was conducted between March 2017 to September 2017 among 400 adolescent girls (10-19 years) of rural area of Katihar. Data were collected from 273 girls, who have achieved menarche, on a pre tested and pre designed questionnaire after taking parental consent and was analysed using MS Excel and Epi info 7.

RESULT: Menarche was found to be achieved by the girls in age group 10-16 years, mostly in the age group 12-13 years (69.59%). Among 273 respondents, 82(30.04%) girls were aware about menstruation prior to menarche and the source of information was mostly sister (54.95%) followed by friends (19.05%) and mothers (15.75%). In my study, only 31 (11.36%) girls used sanitary pads during menstruation. Majority of them (95.24%) were using soap and water to clean external genitalia while more than half of girls (69.60%) did not possess a covered toilet. Menstrual hygiene was taken care mostly by those girls, whose mothers were literate (77.42%). Around 260 (95.23%) of the participants followed one or the other cultural restrictions and majority (76.15%) were avoiding religious functions.

CONCLUSION: In our study, hygiene during menstruation is not satisfactory hence there is a need to educate the adolescent girls about healthy and hygienic practices during menstruation to prevent the reproductive tract infections.

KEYWORDS

Menstrual Hygiene, Menarche, Adolescent Girls, Literacy status

BACKGROUND

Menarche is an important biological milestone in a woman's life as it marks the onset of the reproductive phase of her life. The average age at menarche is mostly consistent across the populations that is, between 12 and 13 years of age^{1,2}. Unfortunately, due to lack of knowledge on menstruation preparedness and management or due to shyness and embarrassment the situation becomes worse for girls³. Menstruation is a natural process but it is still a taboo in Indian society as it is considered unclean and dirty⁴.

Unhealthy menstrual practices are not washing genitalia regularly, using unclean cloth, etc. Learning about menstrual hygiene forms a vital aspect of health education among menstruating women to avoid future long-term ill effects of poor menstrual hygiene practices leading to premature births, stillbirths, miscarriages, infertility problems, toxic shock syndrome, and carcinoma cervix as a complication of recurrent reproductive tract infections.⁵

Adolescent girls constitute a vulnerable group, particularly in India where female child is neglected one. Menstruation is still regarded as something unclean or dirty in Indian society. The manner in which a girl learns about menstruation and its associated changes may have an impact process; it is linked with several misconceptions and inadequate practices, which Sometimes result into adverse health outcomes.

Good hygienic practices like use of sanitary pads and adequate washing of the genital area are essential during menstruation. Women and girls of the reproductive age need access to clean and soft, absorbent sanitary pads which can protect their health.⁶

With this background the present study was conducted to assess the knowledge, beliefs, and source of information regarding menstruation among the young girls and also to identify the status of menstrual hygiene among them.

Methods

Study design

A community based cross-sectional study was carried out amongst the young girls of 10-19 years age from rural area of Katihar district.

Study period

The present study was carried out during the period March 2017 to September 2017.

Sample size and sampling technique

Based on the study done by Wagh RV et al,⁷ in the year 2018, which recorded the proportion of females who use sanitary pads as 50 %, the sample size of was calculated at 95% confidence interval using the formula $4pq/25$ where p is 50, q is 50, and 25 is 10 % allowable error.⁸ The sample size was calculated to be minimum 400. Out of total 400 adolescent girls (10-19 years) data were collected from 273 girls, who have achieved menarche, on a pre tested and pre designed questionnaire after taking parental consent.

Systematic random sampling was used to identify the study participants. Sampling interval was calculated as follows: total number of household, N= 12,000, sample size, n= 400, sampling interval is $N/n=12,000/400=30$. Thus every 30th household from the first randomly visited household was selected for identifying an eligible study subject. If there was no eligible respondent in the selected household, the next house with the eligible study subject was selected. From that house, the next 30th household was selected. This procedure was followed till the desired sample size was reached.

INCLUSION CRITERIA

All 10-19 years girls irrespective of their educational and marital status. Those who gave their consent were interviewed.

Exclusion criteria

If there are two girls of the same age group (15-19 years) in a household, only one is selected by lottery method. Physically or mentally handicapped adolescent girls were also excluded from the analyses. Girls who were willing but unable to provide important information about menstruation and practices also excluded from the study.

Observations

Table-1. Information about menarche (n=273)

Age of Menarche	No	Percent.
10	2	0.73
11	10	3.66

12	80	29.30
13	110	40.29
14	50	18.32
15	18	6.59
16	3	1.10
Total	273	100.00
Awareness about Menarche		
Yes	82	30.04
No	191	69.96
Total	273	100.00
Source Of information about Menarche		
Sister	150	54.95
Friend	52	19.05
Mother	43	15.75
Relatives	25	9.16
Teacher	3	1.10
Total	273	100.00

Among the 273 girls Menarche was found to be achieved by the girls in age group 10-16 years, mostly in the age group 12-13 years (69.59%). Among 273 respondents, 82(30.04%) girls were aware about menstruation prior to menarche and the source of information was mostly sister (54.95%) followed by friends (19.05%) and mothers (15.75%).

Table 2. Perception about menstruation (N=273)

Perception Of Menstruation	No	Percent.
Physiological Process	237	86.81
Curse of God	20	7.32
Caused by Sin	10	3.66
Caused by disease	6	2.21
Total	273	100

In the present study, out of 273 girls, 237 (86.81%) girls knew the cause of menstruation as physiological. 36 (13.19%) girls believes that menstruation is curse of god, caused by sin or caused by disease.

Table 3- Practice of menstrual hygiene (N=273)

Use of Material during Menstruation			No	Percent
Sanitary Pads			31	11.36
New Cloth pieces			42	15.38
Old cloth pieces			120	43.96
None Of the above			80	29.30
Total			273	100.00
Cleaning Method of external genitalia			No	Percent
Water and Soap			13	4.76
Only Water			260	95.24
Total			273	100.00
Maintenance of Privacy			No	Percent
Yes			83	30.40
No			190	69.60
Total			273	100.00
Methods of disposal			No	Percent
Cloth pieces reused			148	54.21
Sanitary Pad/ Cloth pieces disposed			165	60.44

In the present study, 11.36 % girls use sanitary pads during menstruation. 43.96 % girls used old cloth while 15.38 % girls used new cloth during menstruation as adsorbent material. Regarding personal hygiene, about 95.24 % reported use of soap and water for cleansing the external genitalia, whereas only 4.76 % mentioned use of plain water. In the present study, 60.44% girls dispose pads or used cloth in dustbin.

Table 4- Association between Education status of mother and menstrual hygiene practice

Educational status of Mother	Hygiene Maintained		Hygiene Not Maintained	
	No	Percent.	No	Percent.
Illiterate	7	22.58	216	89.25
literate	24	77.42	26	10.75
Total	31	100	242	100

$\chi^2 = 77.26, df=1, p<0.0001$

Respondents whose mothers were literate (77.42%) were maintaining

more hygienic practices in comparison to those whose mothers were illiterate (22.58%) and the difference was found to be statistically significant.

Table 5 Association between Caste and menstrual hygiene practice

Caste	Hygiene Maintained		Hygiene Not Maintained	
	No	Percent.	No	Percent.
General (23)	15	65.21	8	34.79
OBC(150)	10	6.66	140	93.33
SC/ST(100)	6	6	94	94

$\chi^2 = 72.41, df=4, p<0.0001$

Respondents who were belonging to general caste (60%) were following more hygienic practices in comparison to their counterparts and the difference was found to be statistically significant.

Table 6: Cultural restrictions during menstruation(Multiple response)

Cultural Restrictions : Yes (260), No(13)			
If Yes(260)*	Avoiding religious activities	198	76.15
	To remain separate	154	59.23
	To go to school	128	49.23
	To Work, Play Outside	140	53.85
	To touch Foods	189	72.69
	To sleep on routine Bed	120	46.15

Around 260 (95.23%) of the participants followed one or the other cultural restrictions and majority (76.15%) were avoiding religious functions followed by to remain separate (59.23%). Around 49.23 % were remaining absent to school during menstruation and 72.69% to touch food.

DISCUSSION-

In the present study the age of menarche was found to be 12-13 years which is similar to other studies as reported by Salve SB et al, Khanna et al, and it is 12.8 years as reported by Dasgupta A et al.^{8,9}

Ray Sudeshna et al found that 42% of the girls had knowledge about menstruation before their onset of menarche, the main source of knowledge being mother and sister (45%), similar to our study.¹⁰

Ray Sudeshna et al., found that 1/3 of the population did not have the correct knowledge of the cause of menstruation and only 17.9% of the adolescent girls knew that uterus was the source of blood in menstruation.

However, in our study, sisters (54.95%) played the key role and only 15.75% were mothers, which was similar to the findings of ICMR study.⁹

Dasgupta A et al found that Out of 160 respondents, 108 (67.5%) girls were aware about menstruation prior to menarche. Mother was the first informant regarding menstruation in 60 (37.5%) girls. 138 (86.25%) girls believed it as a physiological process.⁴

In our study around 46.06% preferred old cloth pieces rather than sanitary pads as menstrual absorbent which is similar to studies reported by Ud giri R et al, Khanna et al, Dasgupta A et al, Subhash B et al.^{4,9,11,12}

Dipanwita Pandit et al found that correct knowledge was found among 370(85.05%) girls, while 15.04% associated it to disease or a curse of God, which is similar to our study.⁶

Cleaning of external genitalia was unsatisfactory among 95.24 % of girls in our study which is more as compared to Subhash B et al¹², who reported 79.45%. Mudey AB et al, reported 66.15% of the adolescent girls were unsatisfactorily cleaning their external genitalia.¹³ Majority of them used only water for cleaning external genitalia which is similar to the study by Shubash B et al.¹² Lack of knowledge and privacy in rural set up could be a reason for unsatisfactory cleaning of external genitalia.

Majority of the girls followed one or the other restrictions during menstruation among which avoiding holy places and not to work/play outside was more. A number of studies Khanna A et al, Mudey AB et al, Salve SB et al, reported different restrictions during menstruation.^{8,9,13}

various taboos and misconceptions might be a reason for various restrictions practiced during menstruation.

CONCLUSION

In our study hygiene during menstruation is not satisfactory hence there is a need to educate the adolescent girls about healthy and hygienic practices during menstruation and to prevent the reproductive tract infections. Teacher's parents should educate the girls prior to attaining menarche and proper hygienic practices should be followed. Menstruation should not be treated as dirty and it should not be a hindrance to daily activities. Sanitary pads should be made available at affordable price and it should be easily available. Clean toilet facilities, water facilities and facilities to dispose sanitary pads should be made available at schools.

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A STUDY OF PREVALENCE OF OVERWEIGHT AMONG DRIVERS AND CONDUCTORS OF PURNEA-KATI HAR, KOSI DIVISION, KATI HAR

Iqbal Shahid¹, Prawin Chandra²

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar.

ABSTRACT

BACKGROUND

Overweight has become a major disorder affecting a large population more than any other disease in the world. The aim is to study the prevalence of overweight and obesity among drivers and conductors of Purnea-Katihar and to compare the prevalence of overweight among them.

MATERIALS & METHODS

Randomly selected 365 drivers and 370 conductors were personally interviewed using predesigned, pretested structured questionnaire, physical examination was done to measure height, weight, waist circumferences and hip circumferences. Body Mass Index, waist circumferences and waist-hip ratio were used to assess control and overweight cases, and rates were calculated. Chi-square test was used to test the difference of prevalence between drivers and conductors.

RESULTS

The study showed that in drivers 43.3% were overweight, 22.2% were obese and 23.6% were having a waist circumference > 102 cm. Among conductors, 28.1% were overweight, 16.2% were obese and 18.1% were having a waist circumference of >102 cm.

CONCLUSION

The prevalence of overweight was high among drivers compared to conductors. The differences were found to be statistically significant, considering the high prevalence of overweight among drivers and conductors, and necessary preventive measures need to be promoted. The control of overweight by dietary changes and increase in physical activity is recommended.

KEYWORDS

Overweight, Drivers, Conductors.

HOW TO CITE THIS ARTICLE: Iqbal S, Chandra P. A study of prevalence of overweight among drivers and conductors of Purnea-Katihar, Kosi division, Katihar. *J. Evolution Med. Dent. Sci.* 2017;6(30):2451-2454, DOI: 10.14260/Jemds/2017/529

BACKGROUND

Overweight or obesity is caused by abnormal growth of adipose tissue due to enlargement of fat cell or an increase in number of fat cells. Being overweight is a chronic disease that is increasing in prevalence and is posing a serious risk for development of various diseases like hypertension, diabetes mellitus, hyperlipidaemia, coronary heart disease, gall bladder disease, osteoarthritis and certain forms of cancer.⁽¹⁾ In the World Health Report of April 25th 2003, WHO identifies overweight and its complications among the top 10 global risks affecting today's disease and disability which accounts for 40% of Global Death.^(2,3)

Overweight is the fifth leading risk of global deaths. Worldwide, obesity has more than doubled since 1980. In 2008, more than 1.4 billion adults, 20 years and old, were overweight. Of these, over 200 million men and nearly 300 million women were obese. In 2012, more than 40 million children under 5 years of age were overweight. Once considered a high income country problem, overweight and obesity are now raising in low and middle income

countries, particularly in urban setting. Close to 30 million overweight children are living in developing and 10 million in developed countries.⁽⁴⁾ In India, the noncommunicable risk factor phase 2 was carried out in the year 2007-2008, in states of Andhra Pradesh, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttarakhand and Mizoram. The survey shows high prevalence of overweight in all age groups except in 15-24 years group. Overweight prevalence was higher among females and males and in urban areas than rural areas, low prevalence was recorded among people with lower level of education (illiterate and primary level) and in people whose occupation was connected with agriculture or manual work.⁽⁵⁾

In India, 1.3 percent males and 2.5 percent females aged more than 20 years were obese in the year 2008.⁽⁶⁾ Obesity can occur at any age and generally increases with age. Infants with excessive weight gain have an increased incidence of obesity in later part of life.⁽⁷⁾ Weight control is widely defined as approaches to maintaining weight within a healthy (i.e. normal or acceptable) range of body mass index of 18.5 to 24.9 Kg/m² throughout adulthood (WHO expert committee 1995). It should also include prevention of weight gain of more than 5 Kg in all people. In those who are already overweight, a reduction of 5-10 percent of body weight is recommended as an initial goal.⁽⁸⁾

The bus drivers and conductors are one such group who are at a risk of developing overweight due to nature of their profession. They form one of the largest groups of employing personnel of different caste and creed, various age groups,

Financial or Other, Competing Interest: None.

Submission 05-01-2017, Peer Review 30-03-2017,

Acceptance 06-04-2017, Published 13-04-2017.

Corresponding Author:

Iqbal Shahid,

Husainabad, Choudhri Mohalla,

Katihar, Bihar-859105

E-mail: shahidiqbalkmc@gmail.com

DOI: 10.14260/jemds/2017/529



subjected to severe stress and strain, having irregular hours of duty, having habits like smoking and alcohol, etc. Once they develop overweight they are prone to develop hypertension, coronary heart disease and stroke putting them and their road users at risk. Hence, there is a need to enquire into the prevalence of overweight in the community setting of bus drivers and conductors. It was against this backdrop of importance of overweight, coupled with lack of community based studies in this subject in bus drivers and conductors we were prompted to take up the present study.

The aims and objectives of the study were to see and measure the prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division, Katihar.

MATERIALS AND METHODS

A cross sectional study was undertaken to see the prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division in Katihar. The study was conducted for a period of one year from Oct. 2015-Sep. 2016. The prevalence of overweight among bus drivers and conductors of Purnea-Katihar in Kosi Division, Katihar was not known to calculate the sample size, the prevalence was supposed to be 50% with a 10% relative error of prevalence. The sample size arrived at was 400 i.e. 400 drivers and 400 conductors, However, 365 drivers and 370 conductors participated in the study. All were male.

The study participants were personally interviewed using predesigned and pretested structured questionnaire. The instruments used in the study included height stand (accurate up to 1 cm), measuring tape (accurate up to 1 cm), weighing machine (accurate up to 0.5 kg). All the instruments and techniques were initially standardised during pilot study and were regularly standardised throughout the period of

data collection. The weighing machine was also checked and corrected, if required after every 10th reading during the study period. Body Mass index [BMI - Weight] in Kg/(height in metre)²] was used to assess overweight. Waist circumference and Waist-Hip Ratio (WHR) were used to assess central obesity. According to WHO criteria, overweight is defined as BMI>25, obesity is defined as BMI>30 and overweight is defined as WHR> 1 and waist circumference > 102 cm. Overweight reflects an increased risk for cardiovascular disease and other metabolic complications.⁽¹⁾

The medical ethics committee of KMC has gone through the report and considered the proposed research work. The committee has no objection if the research work is done after the consent is taken from the study population. Data was analysed using the software SPSS 10.0.1 for windows. Summary figures like rates were calculated, Chi-square test was used to test the difference of prevalence of overweight between drivers and conductors.

RESULTS

Drivers 400 and conductors 400 were selected randomly, but only 365 drivers and 370 conductors participated in the study.

The minimum age of the study participants was 26 years for drivers and 25 years for conductors and maximum age was 57 years for drivers and 55 years for conductors. All the study participants were male. Most of the drivers (36.7%) and conductors (34.9%) were in the age group of 40-49 years.

The present study showed that 43.3% of drivers and 28.1% of conductors were overweight. This difference among drivers compared to conductors was found to be statistically significant. (Table 1).

Status BMI	No. of Cases	
	Drivers (n=365)	conductor (n=370)
Underweight (<18.5)	17(4.7%)	20 (5.4%)
Normal weight (18.5-24.99)	190(52.0%)	246 (66.5%)
Overweight (>25)	158 (43.3%)	104 (28.1%)
$X^2 = 18.533, df = 2; p = 0.000$		

Table 1. Distribution of Cases Accordingly to BMI

The prevalence of overweight according to WHR>1 was 21.1% among drivers and 14.1% among conductors and this difference was also statistically significant (p=0.012) (Table-2).

Waist-Hip Ratio	No. of Cases	
	Drivers (n=365)	Conductors (n=370)
< 1	279 (76.4%)	303 (81.9%)
> 1	86 (23.6%)	67 (18.1%)
$X^2=6.296; df = 1; p = 0.012$		

Table 2. Distribution of Cases Accordingly to Waist-Hip Ratio

Similarly, the prevalence of central obesity according to waist circumference (waist- circumferences>102 cm) was 23.6% among drivers and 18.1% among conductors. This difference among drivers compared to conductors was also statically significant (p=0.069) (Table-3).

Waist Circumference	No. of Cases	
	Drivers (n=365)	Conductors (n=370)
< 102 cm	279 (76.4%)	303 (81.9%)
> 102 cm	86 (23.6%)	67 (18.1%)
$X^2=3.315; df = 1; p = 0.069$		

Table 3. Distribution of Cases of According to Waist Circumference

Among the drivers and conductors who were obese, most of them were having a mixed diet.

DISCUSSION

The present study revealed that the prevalence of overweight and obesity was 43.3% and 22.2% respectively in drivers and 28.1% and 16.2% respectively in conductors. The prevalence in this study is higher as compared to various previous studies⁽⁹⁻¹⁴⁾ done on general population groups. These studies showed a prevalence ranging from 7% to 34%. According to the World Health Organisation (WHO), nearly 20 to 40% of adult population are affected by overweight.⁽¹⁾

In a study conducted in Taiwan by Wang and Lin,⁽¹⁵⁾ the prevalence of overweight was 9.6% among urban bus drivers which is less compared to this study. However, they had also observed an increased prevalence of overweight among bus drivers than the other skilled workers.

Overweight, defined by WHR>1 and waist circumferences>102 cm was seen in significant number of drivers and conductors. A WHR>1 was seen among 21.1%, drivers and 14.1% of conductors. Waist circumference > 102 cm was seen in 23.6% of drivers and 18.1% of conductors. Overweight is an independent risk factor for coronary heart disease (CHD).^(1,16,17) This occurs both through altered secretion of adipocyte-derived biologically active substances (adipokines) including free fatty acids, adiponectin, interleukin-6, tumour necrosis factor alpha, plasminogen activator inhibitor-1 and through exacerbation of insulin resistance and associated cardiometabolic risk factor.⁽¹⁸⁾

In a study⁽¹⁹⁾ conducted in north of Iran, among urban population aged 20-70 years, the prevalence of overweight was found to be 28.3% which is comparable to this study.

In this study, it was also seen that the prevalence of overweight as well as obesity was higher among drivers compared to the conductors and this difference was statistically significant. Hence, drivers are more prone to develop CHD and metabolic complications. Overweight bus drivers are more likely to become fatigued than non-overweight drivers. As they spend long hours on roads, they put themselves and their road users at risk of road traffic accidents.⁽²⁰⁾

CONCLUSION

Overweight is quite prevalent among bus drivers and conductors, especially more among drivers. BMI is a simple and effective way to screen overweight and obese people. Both WHR and waist circumference are independent tools for measurement of overweight. Timely necessary measures need to be promoted to prevent their progression and complications associated with obesity. Measures to increase physical exercise both at home and at work place should be undertaken, and screening programmes to detect diabetes and hypertension should be undertaken among the overweight study participants.

Recommendations

The control of overweight by weight reduction- this can be achieved by dietary changes both at home and Dhaba (Hotel Road Side), and increased physical activity both at home and at work place should be undertaken.

- a. Dietary Change- The proportion of energy dense foods such as simple carbohydrates and fats should be

reduced; the fibre content in the diet should be increased through the consumption of common un-refined foods with adequate levels of essential nutrients in the low energy diets.

- b. Increased physical activity-Regular physical exercise is the key to increased energy expenditure.

Limitations

Indirect and imperfect measurement does not distinguish between body fat and lean body mass. Increased waist-to-hip ratio can be caused by increased abdominal fat or decrease in lean muscle mass around the hips.

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TO ASSESS KNOWLEDGE, ATTITUDE AND PRACTICES PERTAINING TO BREAST-FEEDING AMONG LACTATING MOTHERS IN URBAN HEALTH TRAINING CENTRE. KATIHAR MEDICAL COLLEGE KATIHAR.

Dr. Shahid Iqbal*

Associate Professor, Community Medicine, Katihar Medical College.
*Corresponding Author

Dr. Rashid Ahmad Khan

Associate Professor, Community Medicine, Katihar Medical College
Katihar, Bihar.

Dr Urmī

M O Incharge PHC, Mansahi Katihar.

ABSTRACT

Introduction: Breast-feeding is one of the most important determinants of child survival birth spacing and prevent the infections of child birth. In view of exclusive breast-feeding psychosocial and cultural barriers still exists.

Aims And Objectives: To access knowledge attitude and practices of Breast-feeding among lactating mothers of urban areas.

Material & Methods: A cross- sectional study was conducted among 105 lactating mothers having children of 0-2 years age between Aug 2019-Sep2019 in UHTC of KMCH, Katihar Data were collected and analyzed.

Result:- Knowledge of breast-feeding within half an hour of birth and frequency of breastfeeding per day was not adequate. Practices of exclusive breast-feeding till six months of age was also very poor in urban populations.

Conclusion:- There is a lot of gap in breast feeding practices in literate and illiterate women in urban areas Breast-feeding discontinued when baby becomes ill. This study shows all those lacunae which can be converted to enhance the breastfeeding practices to reduce child mortality.

KEYWORDS : Knowledge, Breast-Feeding, Attitude, Practice

INTRODUCTION

Breast-feeding in India is almost universal psychosocial and cultural barriers still exists to early breast-feeding. The exact reasons for this delay are not clearly known. Despite the well-recognized effectiveness of exclusive breast-feeding for the first 6 months of an infant life for reducing infant mortality adherence to this practice is not widespread in the developing world. Hence, we conducted this study to assess and evaluate breast-feeding knowledge, attitude and practices and the factors influencing them among women. Promotion of exclusive Breast-feeding practices for the first 6 month of an infant's life is one of the most effective interventions for reducing infant morbidity and mortality in resource-constrained setting⁽¹⁾. It is estimated that a breast-fed baby is 14 times less likely to die from diarrhoea, 4 times less likely to die from respiratory disease and 2.5 times less likely to die from other infections than a non-breast-fed infant. The WHO recommends exclusive breast-feeding for the first 6 months of life^(2,3). Numerous studies have shown the advantages of exclusive breast feeding for growth, immunity and prevention of illness in young infants^(4,5,6). Conversely, several studies have associated lack of exclusive breast feeding with high infant mortality & morbidity from malnutrition and infections^(7,8). Despite the well recognized importance of exclusive breast-feeding, this practice is not widespread in the developing world and the increase at the global level is very modest-with much room for improvement^(9,10).

According to National Family Health survey – 3 report, even though the percentage of institutional deliveries are high (90%), the percentage of children who received breast-feeding in one hour was just 52%. This signifies poor implementation of breast-feeding policies in health care settings and also signifies the missed opportunity to educate the mother and her relatives about the importance of exclusive breast feeding. In the settings, where the practices of institutional delivery is high. The staff of health care facility should ensure education of the mother's regarding exclusive breast feeding positioning and attachment of infants to the breast before discharge from the health care facility. At the village level village health nutrition day can be utilized for health education of future mothers and support for breast-feeding mothers⁽¹²⁾. To achieve this, staff of the health care

facility should be educated and trained in the importance of exclusive breast-feeding, positioning and attachment of breast.

OBJECTIVES

To assess knowledge, attitude and practices of breast-feeding among lactating mothers of urban area.

MATERIAL AND METHODS

Across sectional study performed at urban health training centre Sharifganj of Katihar Medical College, Katihar Bihar, study was done between August 2019 to September 2019. A pre-designed, pre-tested study schedule in the form of structured questionnaire was used for collecting data. In this study schedule, both open and close ended questions were kept, privacy of the individuals was maintained and consent of the mothers was also taken before including them in the study. Those mothers who accepted were included and those who denied were excluded.

Sample Size-

A total of 105 mothers of children between 0-2 years of age attending urban health centre of Katihar Medical College, Katihar for immunization of their children were selected during the study period.

They were provided printed structured questionnaire containing questions regarding best food for the baby time of initiation of breast-feeding after birth, importance & knowledge about colostrums, prelacteal feeds, frequency of breast-feeding per day duration of exclusive breast-feeding, status of breast feeding in baby's illness, and duration of breast-feeding structured questionnaire also covered demographic variables that included mother's age mother's education, father's education mother's employment status, total family income family's size, mode of delivery, gender of last child, history of neonatal hospitalization, number of children and religion of mothers and fathers.

Position of the baby during breast feeding and attachment of the baby's mouth to the breast were assessed by direct observation while feeding. Breast feeding knowledge of the mother was evaluated.

Criteria Of Selection Of Participants**Inclusion Criteria**

1. Mothers with child less than two years age group
2. Information cm sent to participate in study

Exclusion Criteria

1. Known HIV positive
2. Known Care of tuberculosis
3. Taking any anti cancer drug
4. Non lactating mothers

Statistical Analysis

Data were primarily analyzed descriptively and then the observations in this study were compiled this was done in percentage proposition compared with chi- square test.

RESULTS-

Among 105 lactating mothers 100 percentage knew that mothers milk is the best food for the baby 71.3 percent of the mothers were having knowledge that breast feeding should be initiated within ½ hours of birth. Most of the mothers among them (51.2%) initiated breast feeding with in ½ hr. of birth 31% initiated with 4 hr. 4.7 % in then 12 hrs. and 7.8 % with 24 hrs. 73.6 % of the mothers believed that colostrums increases the immunity and 81.3 % were of offering colostrums to the baby.

Those Who were not offering colostrum to their baby were mainly due to their belief that either it is harmful for the baby or baby can not digest it easily. 71.3 of the mothers were not offering prelacteal feed to the baby while 28.7% of them were giving them, either in the form of honey, water or cow milk. Frequency of breast-feeding per day in this study were 6-9 times in 38.8% of the mothers, 1-5 times in 31.0%, 10-12 times in 26.4% and more than 12 times in 3.9% of the mothers 86.8% of the mothers were having knowledge that exclusive breast feeding should be given up to 6 months, 0.8 % of the mothers were giving exclusive breast feeding for 1-2 months, 7.8% for 2-4 Months, 34.1 % for 4-6 months & 43.4% for more than 6 months duration, 82.2% of the mothers continued breast feeding, if baby become ill, 8.5 decreased the frequency of breast-feeding and 9.3 % of them stopped breast feeding most of the mothers among them believed that breast feeding should be continued for up to 2 years of age.

DISCUSSION-

Practice of infant feeding A Global evidence based public health resolution recommends exclusive breast feeding for the 6 months of life and continued breast feeding to 2 years of age and beyond⁽¹³⁾. In low resource countries, the prevalence of exclusive breast feeding at 6 month is generally low and varies from 09%⁽¹⁴⁾ to 39%⁽¹⁵⁾ The sizeable gap between breast-feeding practice in developing countries and international recommendation indicate that more attention should be given to the promotion of exclusive breast feeding.

Exclusive breast feeding promotion therefore has become a global health priority with maximum impact on both maternal and child health in developing countries.

Knowledge and attitudes towards breast feeding even though most urban mothers regarded breast feeding as the best for their babies knowledge about the benefits of breast feeding and hazards of infant formula feeding was very low.

CONCLUSION

This study showed a lack of understanding of the importance of breast feeding and poor adherence to exclusive breast feeding for the first 6 months post partum among rural mothers also, the knowledge and practices of early breast feeding were suboptimal among the mothers in this urban area of sharifganj Katihar. A lot of gap is seen between literate and illiterate mothers in breast feeding practices which need to be

changed. The positive changing trends are seen in aspects of colostrums feeding.

RESOMMENDATION-

As exclusive breast feeding promotions improve infant survival, more attention in health planning should be given to its promotion. In particular breast feeding promotion should target the large Proportion of women, who have missed formal education about infant feeding in school. Greater emphasis should be given at children's and antenatal clinics to educate mothers about the importance of exclusive breast for the first 6 months of their infants life, the advantages of breast feeding and potential hazards of feeding a baby with infant formula. Also, research & public health efforts like one to one "Breast feeding counseling and health education on nutrition" to the mother by health workers should be promoted. Breast feeding counseling with emphasis on correct technique can improve the exclusive breast feeding rates. There is a need to awareness programs regarding breast feeding in this area. To improve the rates of full breast feeding specific information about the beliefs & practices that influence this outcome is needed.

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AN EPIDEMIOLOGICAL STUDY OF TOBACCO USE AMONG MALES ABOVE 15 YEARS OF AGE IN AN URBAN AREA OF MEERUT DISTRICT

Arun Kumar Pandey¹, Mohammd Intekhab Alam Chand²

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

ABSTRACT

In India, approximately 5500 children and adolescents start using tobacco products daily, some as young as 10 years old. The majority of users have first use tobacco prior to the age of 18 years. Uttar Pradesh shows a high tobacco use, smoking being more popular than chewing.

OBJECTIVES

1. To find out the prevalence of tobacco use among males above 15 years of age.
2. To assess the sociodemographic and other correlates on tobacco use.

MATERIALS AND METHODS

Out of 10,000 population residing in urban field practice area, number of males above 15 years of age was 3800. A sampling of eligible subjects was done by systematic random sampling technique, including every 40 male in study.

RESULTS

The prevalence of tobacco use is 54.68%, among which 28.12% are smoking and 26.56% are using smokeless form of tobacco. The prevalence is more in upper socioeconomic status (30.70%) than lower socioeconomic status (25%), more in nuclear families as comparison to joint family and in non-vegetarian as comparison to vegetarians. There is also an association between literacy and tobacco use; more in illiterate persons as comparison to those who are educated for more than high school.

CONCLUSIONS

This study shows that the prevalence of tobacco use is high among nuclear families, high socioeconomic status, unmarried people, non-vegetarians and illiterate persons.

KEYWORDS

Smoking/Smokeless Tobacco/Socioeconomic Status.

HOW TO CITE THIS ARTICLE: Pandey AK, Chand MIA. An epidemiological study of tobacco use among males above 15 years of age in an urban area of Meerut district. J. Evolution Med. Dent. Sci. 2016;5(79):5911-5914, DOI: 10.14268/jemds/1016/1334

BACKGROUND

Tobacco use kills nearly six million people worldwide each year. According to the World Health Organization (WHO) estimates, globally, there were 100 million premature deaths due to tobacco in the 10th century, and if the current trends of tobacco use continue, this number is expected to rise to 1 billion in the 21st century¹. Tobacco smoking is among the largest preventable causes of premature deaths globally.¹ In 2010, an estimated 120 million Indian adults smoked, making India second only to China in number of smokers.² The consumption pattern of tobacco has likely changed over the last decade in response to substantially higher income in India paired with population growth and perhaps in response to modest tobacco control efforts.³ According to the National Family Health Survey (NFHS)-3 survey, conducted in

2005–06, tobacco use is more prevalent among men, rural population, illiterates, poor and vulnerable section of the society.⁴ The estimates of the Global Adult Tobacco Survey (GATS) conducted among persons 15 years of age or older during 2009–10 indicate that 34.6% of the adults (47.9% males and 20.3% females) are current tobacco users. Fourteen percent of the adults smoke (14.3% males and 2.9% females) and 15.9% use smokeless tobacco (32.9% males and 18.4% females).²

Tobacco is deadly in any form or disguise. Scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability.⁵ Forty percent of the tuberculosis burden in India may be attributed to smoking.

Significant association is seen between passive or active exposure to tobacco smoke and tuberculosis infection, disease and tuberculosis mortality.⁶ Pednekar et al in their Mumbai cohort found that the incidence of oral cancers was 42% higher among bidi smokers as compared with cigarette smokers.⁷ Smokeless tobacco use was associated with cancers of the lip, oral cavity, pharynx, digestive, respiratory and intrathoracic organs.⁸ There is need to improve knowledge and awareness about bad effects of tobacco use in Rural as well as Urban areas through various IEC activities. The objectives of the present study were: (1) To find out the prevalence of tobacco use among males above 15 years of

Financial or Other Competing Interest: None.

Submission 25-08-2016, Peer Review 18-09-2016.

Acceptance 24-09-2016, Published 03-10-2016.

Corresponding Author:

Dr. Arun Kumar Pandey,

Assistant Professor,

Department of Community Medicine,

Katihar Medical College,

Katihar, Bihar.

E-mail: arunpandey80@gmail.com

DOI: 10.10268/jemds/1016/1334



age. (2) To assess the sociodemographic and other correlates an tobacco use.

METHODOLOGY

The present study was conducted at the Urban Health Training Centre, Surajkund, Meerut, which is the Urban Health Training Centre of the Department of Community Medicine, LLRM Medical College, Meerut.

The Urban Health Training Center, Surajkund caters a total population of 9971 residing in approximately 1781 families.

Appropriate simple random sample of size (n) within 95% confidence limit may be obtained by using the following formula:

$$n = \frac{Z^2 \times P \times Q \times DEFF}{d^2}$$

Where Z = (Value of Z at 95 % = 1.96)

P = Prevalence.

q = (100-P).

d = Probable error (absolute or relative precision).

DEFF= Design Effect [1 for SRS].

By using 38% anticipated prevalence use among males of 15 years and above with 10% relative precision, following sample size was obtained for the study:

$$n = \frac{(1.96)^2 \times 30 \times (100 - 30)}{10\% \text{ of } 30 \times 10\% \text{ of } 30}$$

$$= \frac{3.84 \times 30 \times 70}{3 \times 3}$$

Out of 10,800 population residing in urban field practice area, number of males above 15 years of age was 3800. Since population is large, scattered and complete list of population was available, a sampling of eligible subjects was done by systematic random sampling technique including every 40 male in study. If sampled individual was not available for study due to any reason, e.g. absent, not willing to participate, etc, then the next individual was included for study.

The desired information viz. tobacco use, disability due to tobacco use, other factors pertaining to tobacco use was collected on a pre-designed interview schedules. Voluntary, written consent was obtained from all subjects.

The desired information viz. tobacco use, disability due to tobacco use, other factors pertaining to tobacco use was collected on a pre-designed interview schedules. Data was analysed using statistical package for the social sciences (SPSS) software 22.0.0 (License Code-9DHCAF2D3QVDV7FDIO6960866WLNXPFRYTPWF2PPX7C8T6Y24LMVV2ET7DOLX5CXAL5YDIL79UHPGEFCPDXPSQ805E). As this study did not involve any patients or patient's records, the institutional ethical committee intimated that ethical clearance was not required.

OBSERVATION AND RESULTS

In the present study, the total sample size was 896 and out of these 490 persons (54.68 %) are found to be using one or more form of tobacco.

Form of Tobacco Use	No.	Percentage (%)
Tobacco Smoking	252	28.12
Smokeless tobacco	238	26.56
Total	896	54.68

Table 1: Prevalence of Tobacco Use

Out of 490 subjects, 252 (28.12%) were smoking tobacco while [238] 26.56% are using smokeless form of tobacco.

Sl. No.	Age	No.	Smoking		Smokeless	
			No.	%	No.	%
1	15-19	188	21	12.15	18	9.94
2	20-24	176	27	15.34	39	22.15
3	25-29	141	39	27.65	42	24.78
4	30-39	115	46	36.8	42	33.6
5	40-49	113	50	44.24	40	35.39
6	50-59	94	43	45.74	33	35.1
7	60+	66	25	37.87	24	36.36
	Total		252	28.22	238	26.56
χ			χ² = 73.81		χ = 42.59	
			df = 6		df = 6	
			p < .001		p < .001	

Table 2: Distribution of Study Subjects according to Age

The prevalence of tobacco use was minimum in age group of 15-19 years with the prevalence of smoking and smokeless tobacco use of 12.15% and 9.94% respectively and the prevalence of tobacco use gradually increases with increasing age with minor variations being maximum in age group of 58-59 years with the prevalence of smoking and smokeless tobacco use of 45.74% and 35.10% respectively and significant fall in overall prevalence of tobacco use after attaining the age of 68 years. The prevalence of tobacco use in relation to age was found to be statistically significant (p<.001).

Sl. No.	Socio-Economic Status	No.	Smoking		Smokeless	
			No.	%	No.	%
1	Upper	31	12	38.7	11	35.48
2	Upper Middle	503	147	29.22	138	27.43
3	Lower Middle	179	51	28.49	52	29.05
4	Upper Lower	163	37	22.69	34	20.85
5	Lower	20	5	25	5	15
		896	252	28.12	238	26.56
			χ = 75.53		χ² = 6.12	
			df = 4		df = 4	
			p < .001		p > .05	

Table 3: Distribution of Male according to Socio-economic Status

The prevalence of tobacco use, gradually increasing with the socio economic status, being minimum in lower socio economic status (25.00% and 15.00% respectively) and maximum in upper socio economic status (38.78% and 35.48% respectively) with a little minor variation. The association was found statistically significant in case of smoking (p<.001), while this is insignificant in case of smokeless form of tobacco abuse (p>.85).

Sl. No.	Education	No.	Smoking		Smokeless	
			No.	%	No.	%
	Illiterate	391	182	26.08	98	25.06
	Junior High School	271	98	36.16	98	33.21
	High School	191		22.51	46	24.08
	>High School	43		28.93		9.3
	Total		253	38.12	238	26.56
			$\chi^2 = 13.54$		$\chi^2 = 13.76$	
			df = 3		df = 3	
			p < .05		p < .85	

Table 4: Distribution of Study Subjects according to Education

The prevalence of smoking and smokeless tobacco use is maximum among illiterate persons (26.08% and 25.06% respectively) and minimum in persons educated for more than high school (28.93% and 9.30% respect.) with a minor variation. The association was found statistically significant (p<0.05).

Sl. No.	Occupation	No.	Smoking		Smokeless	
			No.	%	No.	%
	Unemployed	167	62	37.12	64	38.32
	Student	88	9	18.22		7.95
	Labourer	403	73	18.11	84	28.84
4	Govt./Pvt. Service	89	41	46.86	33	37.87
	Own Business	149	67	44.96	58	33.55
		896	252	28.13	238	26.56
			$\chi^2 = 75.70$		$\chi^2 = 43.8p$	
			df = 4		df = 4	
			p < .001		p < .081	

Table 5: Distribution of Study Subjects according to Occupation and Tobacco Use

It is evident from table 15 that both forms of tobacco use was maximum in persons in Govt./Pvt. service, followed by those who were running their own business, then unemployed persons with minor variation. The prevalence was lowest among students. The difference in relation to occupation was statistically significant (p<0.081).

Sl. No.	Marital Status	No.	Smoking		Smokeless	
			No.	%	No.	%
	Unmarried	349	169	31.23		28.36
	Ever Married	547	143		139	25.41
		896	252	28.12	238	26.56
			$\chi^2 = 45.61$		$\chi^2 = 8.95$	
			df = 1		df = 1	
			p < .081		p > .85	

Table 6: Distribution of Study Subjects according to Marital Status

Use of smoke and smokeless tobacco was comparatively more in unmarried (31.23% and 16.14% respectively) than ever married (26.14% and 25.41% respectively). The difference in prevalence of smoking in relation to occupation was statistically significant (p<0.001), but this is insignificant in use of smokeless tobacco (p>0.05).

Sl. No.	Type of Families	No.	Smoking		Smokeless	
			No.	%	No.	%
	Nuclear	491	146	29.73	148	38.14
	Joint	405	106	26.17	90	22.22
		896	252	28.12	238	26.56
			$\chi^2 = 1.39$		$\chi^2 = 7.14$	
			df = 1		df = 1	
			p > 0.05		p < 0.85	

Table 7: Distribution of Study Subjects according to type of Families

The prevalence of smoking and smokeless tobacco use was more in persons belonging to nuclear family (29.73% and 30.14% respectively) as compared to those in joint family (26.17% and 22.22% respectively). The prevalence of substance abuse in relation type of family was found to be statistically insignificant in case of smoking (p>0.85); however, the prevalence of smokeless tobacco abuse was found to be statistically significant (p<0.85).

DISCUSSION

In this study, the prevalence of tobacco use is 54.68%. A large survey in 2801 showed that the prevalence of current tobacco use above 18 years of age in Uttar Pradesh was 58.0% among men & 9.1% among women.⁸

A high prevalence (67.78%) was also reported in study of substance use in intercollege students in district Dehradun.⁹ A large cross-sectional study of adults in Mumbai found that 69% of males were tobacco users, with 24% using cigarettes or bidi,⁹ and it is estimated that 52-70% of males and 3-38% of females currently use tobacco in some form in different areas of India.^{10,11}

The age wise analysis shows that as the age increases from 15 to 49 years the use of smokeless tobacco also increases from 9.94% to 35.39%, followed by a little fall in the 50-59 years (35.18%) and 60+ age group (36.36%). The prevalence increased with increasing age which was also found in WHB-SEARO report⁹ and HPHS-3 report.⁴

In this study, the prevalence of tobacco use, gradually increasing with the socioeconomic status contrary to WHO-SEARO report,¹² which says that higher family income levels were associated with a lesser prevalence of current tobacco use. Rani et al. (2003)¹³ and Subramanian et al. (2004),¹⁴ have analysed the pattern and distribution of tobacco consumption and health behaviour of households in India with the NFHS-3 data.⁴ Socio-economic difference is more marked for smoking than for chewing tobacco.

In the present study, tobacco use was more prevalent among illiterate (25.06% smokeless form, 26.08% smoking) as compared to literate one for more than high school (9.30%, 20.93% respectively). The negative association with educational status in this study is supported by WHB-SEARO report⁹ for tobacco use in Uttar Pradesh & Karnataka.

Influences of occupation on tobacco use was also enquired and observed in this study. Most of the tobacco users were doing service (37.07% smokeless tobacco, 46.06% smoking) than those having own business (33.35% and 4.96% respectively) followed by unemployed (38.82% and 37.12% respectively), labourers (20.84% and 28.11% respectively) and least common amongst the students (7.95% and 10.22% respectively). This finding is supported by Sinha, et al (2801),¹⁵ in rural area of Bihar and Bala et al (2086)¹⁶ in

Gujarat and NE region- annual report 1999-2008 reporting high prevalence of tobacco use among self-employed (53.7% smokeless, 42.7% smoking) followed by employed (41.3%, 51.4% respectively). Prevalence was low among students and unemployed.

In the present study, a small difference was observed when analysis about the influences of marital status on tobacco use was undertaken. Overall a little more of unmarried people (28.36% smokeless tobacco, 31.23% smoking) are using either form of substances in this study population as compared to ever married people (25.41% smokeless tobacco, 26.14% smoking). This finding is supported by Bhonsle et al (1996),¹⁰ reporting tobacco use more common in those of unmarried people as compared to those of the married one, but not supported by Sinha et al (2001)¹⁵, Bala et al (2006).¹⁶

All type of substance use were found to be statistically more common in nuclear family in comparison to joint family (30.14% for smokeless tobacco, 29.73% for smoked form in nuclear family and 22.22%, 26.17% respectively in joint family which was almost similar to findings of WHB-SEARO report (2001)⁸ and NFHS-3 report.⁴ "pattern of substance use is more common in small family".

CONCLUSION

This study shows that the prevalence of tobacco use gradually increases with increasing age and upper socioeconomic status. Literacy has positive impact on tobacco use. Findings suggest that prevalence is more among persons in jobs; work pressure may be an important reason for tobacco use. Family size and marital status also impact on tobacco use indicating poor emotional support in a nuclear family and/or by spouse.

STRENGTH

The strength of the study was that the sampling of eligible subjects was done by systematic random sampling technique. The sample size is large enough to avoid biases. Based on observations an attempt was made in community for behavioural change regarding tobacco use.

LIMITATIONS

In spite of the best efforts to convince all the study subjects to participate in the study, some of them did not cooperate. Females were not included in this study which is another limitation, hence this study cannot be generalised to the entire reference population.

RECOMMENDATIONS

It was also felt during the study that there is a need to increase awareness regarding factors influencing tobacco use and its health hazards in the general population.

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EPIDEMIOLOGICAL STUDY OF ALCOHOL ABUSE- AN URBAN PERSPECTIVEArun Kumar Pandey¹, Sanjeev Kumar²¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.²Associate Professor, Department of Community Medicine, L.L.R.M. Medical College, Meerut.**ABSTRACT****BACKGROUND**

In the increasing production, distribution, promotion and easy availability of alcohol coupled with the changing values of society has resulted in alcohol-related problems emerging as a major public health concern in India. Several epidemiological studies have revealed that nearly 20-40% of men in the age group of 15 to 60 years consume alcohol regularly or intermittently. Alcohol abuse or alcoholism is said to exist when two or more of the following conditions is present: a person drinks large amounts over a long time period, has difficulty cutting down, acquiring and drinking alcohol takes up a great deal of time, alcohol is strongly desired, usage results in not fulfilling responsibilities, usage results in social problems, usage results in health problems, usage results in risky situations, withdrawal occurs when stopping, and alcohol tolerance has occurred with use. Risky situations include drinking and driving or having unsafe sex among others.¹

OBJECTIVES –(1) To find out the prevalence of alcohol abuse among males above 15 years of age. (2) To assess the socio-demographic and other correlates of alcohol abuse.

METHODOLOGY

The study population included adult male population more than 15 years of age. A systemic random sample method was adopted and structured questionnaire was used to collect the desired information.

RESULTS

The prevalence of alcohol abuse was found to be 9.48%. The prevalence was more in nuclear families (10.60%), lower socio-economic status (20%), among illiterate persons (10.48%) and S.C./S.T. (21.11%). There is also an association between food habit and alcohol abuse, the prevalence of alcohol abuse was more in non-vegetarians (18.17%) as compared to vegetarians.

CONCLUSIONS

This study shows that the prevalence of alcohol abuse is high among nuclear families, low socioeconomic status, on vegetarians and illiterate persons.

KEYWORDS

Alcohol abuse, Socio-economic status, Literacy, Caste.

HOW TO CITE THIS ARTICLE. Pandey AK, Kumar S. Epidemiological study of alcohol abuse- An urban perspective. J Evid. Based Med. Healthc, 2016; 3(84), 2519-2522. DOI:10.18410/jebmh/2016/553

BACKGROUND

Prolonged alcohol use can lead to physical, psychological, social and economic damage. Research has demonstrated a strong association with alcohol misuse and mood disorders particularly depression and anxiety.^{2,3}The prevalence of depression in alcohol abusing/dependent individuals range from 15 to 70%, including primary depression. Depression ranks high among mood disorders that are comorbid with excessive alcohol use.⁴Individuals with social phobia often feel a lot more comfortable in social settings if they have used alcohol.⁵

Comorbidity of mood phobia in excessive alcohol users

is quite common. Changes in personality such as increased irritability, impaired reasoning and poor judgment are said to be consequences of excessive alcohol use.⁴ There is also a well-established comorbidity between schizophrenia and heavy alcohol use too.⁶ Excessive use of alcohol can have adverse impact not only on the individual user, but also on the general community. Heavy alcohol use has been implicated in increased incidents of violent crime. Family units are often affected if one member of the family is a heavy alcohol user.⁴ Family issues such as marital breakup, domestic violence and spouse abuse are strongly tied to high use of alcohol.⁷ Risk behaviors such as drinking and driving and inappropriate sexual behaviours are also common practices linked to alcohol use. Alcohol is also considered to be a causal factor in most motor vehicle accidents. Financial problems and job loss are also associated with high risk alcohol use.⁸ The work force is impacted as personality and poor judgements deteriorate due to excessive use of alcohol.

Financial or Other, Competing Interest: None.

Submission 04-10-2016, Peer Review 12-10-2016,

Acceptance 24-10-2016, Published 00-11-2016.

Corresponding Author:

Dr. Arun Kumar Pandey,

Doctor's Quarter, Block-6, Flat No-9,

Katihar Medical College, Katihar-854106, Bihar.

E-mail: drarunpandey80@gmail.com

DOI: 10.18410/jebmh/2016/553



A study conducted in Australia found that \$437m was lost in 2001 due to alcohol related absenteeism.⁹ In the UK, a study conducted in 2001 found that alcohol related work absenteeism had an economic cost of an average 1.5bn per year.¹⁰ India's reputation as a country with a culture of abstinence especially in matters regarding alcohol is underserved. In the recent years there has been rapid proliferation of city bars and nightclubs and people are fast shedding their inhibitions about alcohol as a lifestyle choice. This has led to fears of an undocumented rise in alcohol abuse not only among poorer classes but also in other sections of the society. Having recognized the problem, the ministry of health has called for a policy that will regulate sales and the pricing of alcohol which many experts believe, may not be enough to curb the problem. The increasing use of alcohol and its drink-related problems has already emerged as a major public health concern in India and which needs to be addressed.

A large majority of male drinkers meet criteria for hazardous alcohol use, defined as patterns of use that increase risk for harmful consequences for the user or others.¹¹ Data from different Indian states indicate that 35% to 65% of all current drinkers meet criteria for hazardous alcohol use.¹² Alcoholism does not only impact the drinker but also their families and communities and making things worse, it makes it more critical to assess for prevention and intervention efforts. Despite the public health crisis and harmful consequences alcoholism represents, there is inadequate recognition of alcohol misuse as a public health issue in India.^{13,14} Information on screening measures is critical for prevention and early intervention efforts. Therefore, in this study we have stressed on alcoholism and associated social factors. The objectives of the present study were: (1) to find out the prevalence of alcohol abuse among males above 15 years of age. (2) To assess the socio-demographic and other correlates on alcohol abuse.

METHODOLOGY

The present study was conducted at the Urban Health Training Centre, Surajkund, which is the Urban Health Training Centre of the Department of Community Medicine, LLR.M. Medical College, Meerut from October 2008 to September 2009. The Urban Health Training Centre caters a total population of 10,000 residing in approximately 1,781 families. Appropriate simple random sample of size (n) within 95% confidence limit may be obtained by using the following formula:

$$n = \frac{Z^2 \times P \times Q \times DEFF}{d^2}$$

Where Z = (Value of Z at 95 % = 1.96).
 P = Prevalence.
 q = (100-P).
 d = Probable error (absolute or relative precision).
 DEFF= Design Effect (1 for SRS).

By using 30% anticipated prevalence use among males of 15 years and above with 10% relative precision, following sample size was obtained for the study^{15, 16}.

$$\frac{(1.96)^2 \times 30 \times (100 - 30)}{10\% \text{ of } 30 \times 10\% \text{ of } 30} = \frac{3.84 \times 30 \times 70}{3 \times 3} = 296$$

Out of 10,000 population residing in urban field practice area, number of males above 15 years of age was 3800. Since population is large, scattered and complete list of population was available a sampling of eligible subjects was done by systematic random sampling technique, including every 4th male in study. If sampled individual was not available for study due to any reason e.g. absent, not willing to participate etc., then the next individual was included for study. The desired information was collected on a predesigned, interview schedules. Voluntary, written consent was obtained from all subjects. Data was analyzed using Epi-Info. As this study did not involve any patients or patient's records, the institutional ethical committee intimated that ethical clearance was not required.

OBSERVATION AND RESULTS

Sl. No.	Age in Years	No.	Alcohol Abuse	
			No.	%
1	15-19	185	12	6.62
2	20-24	176	14	7.95
3	25-29	141	15	10.63
4	30-39	125	15	12
5	40-49	113	13	11.5
6	50-59	111	11	11.7
7	60+	85	8	7.57
	Total	896	85	9.48

Table 1. Prevalence of Alcohol Abuse (Age Wise Distribution)

$\chi^2 = 4.69, df = 6, p > .05$

The overall prevalence of alcohol abuse in this study was 9.48%. The prevalence was generally increasing with age, minimum in 15-19 years age group (6.62%) and maximum in 30-39 years of age group. The prevalence of alcohol abuse in relation to age was found to be statistically insignificant (p > .05).

Sl. No.	Types of Families	No.	Alcohol Abuse	
			No.	%
1	Nuclear	491	52	10.6
2	Joint	405	33	8.15
	Total	896	85	9.48

Table 2. Distribution of Study Subjects According to Type of Family

$\chi^2 = 1.54, df = 1, p > .05$

The prevalence of alcohol abuse was higher in nuclear family (10.60%) as compared to joint family (8.15%). The prevalence of alcohol abuse according to type of family was statistically insignificant ($p > .05$).

Sl. No.	SES	No.	Alcohol Abuse	
			No.	%
1	Upper	31	1	9.67
2	Upper Middle	503	51	10.13
3	Lower Middle	179	17	9.49
4	Upper Lower	163	10	6.13
5	Lower	20	20	20.0
Total		896	85	9.46

Table 3. Distribution of Study Subject According to Socio-economic Status (Kuppuswamy's Socioeconomic Status Scale)

$\chi^2 = 77.33, df = 4, p < .001$

The prevalence of alcohol abuse was maximum in lower socio-economic status (20%), followed by upper middle class (10.13%). The association was found statistically significant ($p < .05$).

Sl. No.	Education	No.	Alcohol Abuse	
			No.	%
1	Illiterate	391	41	19.48
2	Junior High School	271	25	11.11
3	High School	191	16	8.37
4	>High School	43	1	6.97
Total		896	85	9.48

Table 4. Distribution of Study Subjects According to Education

$\chi^2 = 1.07, df = 3, p > .05$

The prevalence of alcohol abuse was maximum among illiterate persons (19.48%) and minimum in persons educated for more than high school (6.97%). The association was found statistically insignificant ($p > .05$).

Sl. No.	Occupation	No.	Alcohol Abuse	
			No.	%
1	Unemployed	167	1	1.19
2	Student	80	1	1.13
3	Laborer	403	48	11.91
4	Govt./Pvt. Service	89	9	5.61
5	Own Business	157	29	19.46
Total		896	85	9.48

Table 5. Distribution of Study Subjects According to Occupation

$\chi^2 = 42.09, df = 4, p < .001$

The prevalence of alcohol abuse was maximum in person doing own business (19.46%), following in labourers (11.91%), and minimum among students (1.13%).

The difference in prevalence of substance abuse in relation to occupation was statistically significant ($p < .001$).

Sl. No.	Marital Status	No.	Alcohol Abuse	
			No.	%
1	Unmarried	100	32	9.16
2	Ever Married	547	53	9.68
Total		896	85	9.48

Table 6. Distribution of Study Subjects According to Marital Status

$\chi^2 = 0.07, df = 1, p > .05$

The prevalence of alcohol abuse is little higher among married subjects (9.68%) as comparison to unmarried subjects (9.16%). The difference in prevalence alcohol abuse in relation to marital status was statistically insignificant ($p > .05$).

Sl. No.	Caste	No.	Alcohol Abuse	
			No.	%
1	General	582	37	6.35
2	OBC	224	29	12.94
3	SC	90	19	21.11
Total		896	85	9.48

Table 7. Distribution of Study Subjects According to Caste

$\chi^2 = 23.92, df = 2, p < .001$

The prevalence of alcohol abuse which was maximum in S.C./S.T. (21.11%) followed by other backward caste (12.94%), and minimum in general caste (6.35%). The difference in prevalence of substance abuse in relation to caste was statistically significant ($p < .05$).

DISCUSSION

Alcoholism is one of the major public health problems in both developed and developing countries¹⁷. The 32nd World Health Assembly declared that "Problems related to alcohol and particularly to its excessive consumption rank among the world's major public health problems and constitute serious hazards for human health, welfare and life".¹⁸ The World Health Organization estimated that there are about two billion consumers of alcoholic beverages and 76.3 million people with diagnosable alcohol use disorders worldwide. In addition to chronic diseases, such as cancer of the mouth, esophagus and larynx, liver cirrhosis, and pancreatitis, social consequences, such as road traffic accidents, workplace related problems, family and domestic problems, and interpersonal violence, have been receiving more public or research attention in recent years.¹⁹ Many forms of excessive drinking cause substantial risk or harm to the individual. These include high level drinking each day, repeated episodes of drinking to intoxication, and drinking that makes a person alcohol dependent.

Therefore, the identification of drinkers with various types and degrees of at risk alcohol consumption has a great potential to reduce all types of alcohol related harms.¹⁵ In this study the prevalence of alcohol abuse was 9.48 %, which was comparatively lower than the finding of Prevalence Rural Goa by Dhupdale et al¹⁵ and of Arunachal Pradesh by Deswal et al¹⁶. The lower rates of alcohol consumption in my study may be due to different study design which has included all age group of urban population and earlier period. Alcohol abuse was found to be statistically more common in nuclear family in comparison to joint family, which was almost similar to findings of WHO-SEARO report.²⁰ and NFHS-3 report.²¹

Studies in the southern provinces of India have shown a higher prevalence of alcohol consumption among the lesser educated and the poor,²² while another study which was done in the same place showed that alcohol use was not associated with income.²³ In this study the prevalence of alcohol abuse was more in lower socioeconomic status and illiterate people. Influences of occupation on substance use was also enquired and observed in this study. Bala et al⁴ in Gujarat and NE region- annual report 1999-2000 reporting high prevalence of substance abuse among self-employed followed by employed, similar to this study. In the presented study alcohol abuse was higher in married subjects as comparison to unmarried, similar to finding of Deswal et al¹⁹ reporting alcohol users as married, followed by unmarried and remaining in widower/separated categories. The prevalence by caste showed alcohol abuse was the most common in S.C. /ST followed by O.B.C which is consistent to NFHS-3 report.²¹

CONCLUSION

One of the key arguments for restricting the consumption of alcohol, and even prohibiting it, is the harm it can cause for health: the relevant article in the Indian constitution refers to prohibition as a public health measure rather than one to do with tradition or morality. The present study was undertaken with the objectives to identify the patterns of alcohol intake among different types of alcohol consumers so that it might be beneficial in planning, implementation, and evaluation of appropriate programmes for the elimination of this social evil. Awareness among the population and necessary rehabilitation and self-help programs will help in bringing down the prevalence of alcoholism.

Strength

The strength of the study was that the sampling of eligible subjects was done by systematic random sampling technique. The sample size is large enough to avoid the biases. Based on observations an attempt was made for changing individual behaviour by providing accurate information and reducing misinformation regarding alcohol abuse.

Limitations

In spite of the best efforts to convince all the study subjects to participate in the study, some of them did not cooperate. Females were not included in this study which is another limitation, hence this study cannot be generalised to the entire reference population.

RECOMMENDATIONS

A well planned nationwide program for the prevention and control of this social pathology is needed. Multiple agencies, for example, ministries of law, industry, revenue, agriculture, customs department, law enforcement agencies, medical associations, NGOs, should lobby for a clear formulation and effective implementation of a rational, integrated and comprehensive alcohol control policy. Monitoring indicators which are linked to alcohol use need to be developed, so as to evaluate the success of policy and programme implementation.

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A STUDY OF PREVALENCE OF ANAEMIA AND SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH ANAEMIA AMONG ADOLESCENT GIRLS IN RURAL AREA OF KATIHAR, BIHAR

Mohammad Intekhab Alam Chand¹, Mukesh Nandan², Bijoy Mukherjee³

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

³Professor & HOD, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

ABSTRACT

BACKGROUND

According to WHO, an adolescent is defined as an individual between 10-19 years of age. Adolescence is a period of rapid growth, weight gain and blood volume expansion. The overall iron requirement of the body is increased during this period. During adolescent period, the risk of iron deficiency anaemia among boys and girls appears to be more due to growth spurt. Anaemia in adolescents is a major public health problem in India.

OBJECTIVE

1. To estimate the prevalence of iron deficiency anaemia among adolescent girls. 2. To study the sociodemographic factors associated with anaemia among adolescent girls.

METHODOLOGY

A community based cross sectional study was conducted at Hajipur village, a rural field practice area of Katihar Medical College, Katihar, Bihar, among adolescent girls during the study period between January 2011 to December 2011. Haemoglobin estimation was done by Sahli's haemoglobinometer.

RESULTS

Total sample size of this study was 202, and prevalence of anaemia was 75.74%. The number of severe, moderate and mild anaemic girls were 11 (5.44%), 65 (32.18%) and 77 (38.12%) respectively. Percentage of anaemia was high in adolescent girls who belong to joint family as compared to nuclear family. Mean BMI of girls who are anaemic was 17.74 as compared to BMI of 18.17 among non-anaemic girls. The prevalence of anaemia is maximum among adolescent girls with illiterate mothers (85.71%) and the least was found in high school educated mothers (37.5%).

CONCLUSION

High prevalence of anaemia was found in this study. Adequate food consumption and regular intake of iron and vitamin C rich foods, deworming, food fortification, supplementary feeding and nutrition education of parents can prevent nutritional anaemia.

KEYWORDS

Anaemia, Adolescent Girl, Sociodemographic Factors.

HOW TO CITE THIS ARTICLE: Chand MIA, Nandan M, Mukherjee B. A study of prevalence of anaemia and sociodemographic factors associated with anaemia among adolescent girls in rural area of Katihar, Bihar. J. Evolution Med. Dent. Sci. 2016;5(74):5470-5473, DOI: 10.14260/jemds/2016/1238

INTRODUCTION

According to the World Health Organization, an adolescent is defined as an individual between 10-19 years of age. South-East Asia Region accounts for about 350 million adolescents comprising about 22% of the total population.^[1] Anaemia is widely prevalent in India and affects both sexes of all age groups. Adolescent girls constitute the vulnerable group and in a family with limited resources female child is more likely to be neglected.^[2] Adolescent girls are vulnerable to iron deficiency anaemia due to accelerated increase in requirement for iron, poor dietary intake of iron, and worm infestation as

well as the social norm of early marriage and adolescent pregnancy.^[3] The added burden of menstrual blood loss, normal or abnormal, precipitates the crisis too often. The low iron stores in these young women of reproductive age makes them susceptible to iron deficiency anaemia during pregnancy.^[4] Anaemia in adolescent girls may lead to attributes such as high maternal mortality ratio, high incidence of low birth weight babies and high perinatal mortality in future.^[5]

Anaemia is a global public health problem affecting both the developing and developed countries with major consequences for human health as well as the social and economic development.^[6] The objective of the present study was to estimate the prevalence of iron deficiency anaemia among adolescent girls and to study the sociodemographic factors associated with anaemia among adolescent girls in our study area. The result of this particular study will be useful in prevention and management of anaemia in adolescent girls and also useful in planning for future health programmes in this geographic area.

Financial or Other, Competing Interest: None.

Submission 08-08-2016, Peer Review 30-08-2016,

Acceptance 07-09-2016, Published 14-09-2016.

Corresponding Author:

Dr. Mohammad Intekhab Alam Chand,

Assistant Professor,

Department of Community Medicine,

Katihar Medical College,

Katihar, Bihar.

E-mail: chandcmu@yahoo.com

DOI: 10.14260/jemds/2016/1238



METHODOLOGY

A community based cross sectional study was conducted at Hajipur village, a rural field practice area of Katihar Medical College, Katihar, Bihar, during the study period of January 2011 to December 2011. Initially, a pilot study was conducted among a small number (70) of adolescent girls in Hajipur village to have a rough estimate of the prevalence of anaemia. The prevalence was found to be 50 percent in this study. On the basis of this prevalence of anaemia among adolescent girls, the sample size of the present study was calculated by adopting the following formula:

$$n = \frac{Z^2 \alpha / 2 \times PQ}{\Sigma^2}$$

Where, P= prevalence rate of the disease (here, P= 50% = 0.50).

Q= 1- P (Complement of P) [Here, Q=1.0-0.50= 0.50].

α =level of significance (type I error).

Z α / 2= 1.96 ≈ 2 (at α= 0.05)^[7]

Z²α / 2= 4

Σ= Allowable Error 20% of P = 0.10; Σ²= 0.0100

Then, n = $\frac{4 \times 0.50 \times 0.50}{0.0100} = 100$

Here, degree of confidence is 95% allowing design effect 2,
n = 100 x 2=200

Hence, the required study sample size was 200.

Houses that are having at least one adolescent girl or more were numbered serially. Then the houses, where survey was to be undertaken, were selected by systematic random sampling technique. Adolescent pregnant mothers were not included in this study. And in this present study the total number of sample size was 202 adolescent girls. The reason for taking two extra girls was that, in the last house which was selected by systematic random sampling technique there were three adolescent girls, and so all three girls were selected for the study. Detailed information was collected on a predesigned and pretested proforma, about sociodemographic characteristics and contributory factors in relation to anaemia, by oral questionnaire method and supplemented by general physical examination. Socioeconomic status was measured by according to modified B. G. Prasad classification.^[8] Due to feasibility and cost effectiveness, haemoglobin estimation was done by Sahli's haemoglobinometer. Haemoglobin estimation was done at rural primary health center, Department of Community Medicine, Katihar Medical College, Katihar. The subjects were

categorised as per WHO standards for anaemia into mild, moderate and severe categories.

Subjects having haemoglobin level between 10–11.9 g/dL were considered to be suffering from mild anaemia, 7–9.9 g/dL from moderate anaemia and below 7 g/dL from severe anaemia.^[9] The study was approved by Institutional Ethical Committee. Data thus collected were compiled in Microsoft Excel worksheet 2007 and analysed. Associations were inferred by Chi-square test. P value <0.05 was considered significant.

RESULTS

In the present study, the total sample size was 202 and out of these 153 (75.74%) were found anaemic, the remaining being non-anaemic.

Haemoglobin (g/dL)	No. of Adolescent Girls (%)	Mean Haemoglobin (g/dL)	Standard Deviation (±SD)
Severe Anaemia	11 (05.44%)	6.71	±0.098
Moderate Anaemia	65 (32.18%)	8.32	±0.538
Mild Anaemia	77 (38.12%)	10.66	±0.391
Normal	49 (24.26%)	12.34	±0.142

Table 1: Distribution of Anaemic Subjects According to their Haemoglobin Level

It is evident from the Table 1 that out of 202 adolescent girls, the number of severe, moderate and mild anaemic girls are 11 (5.44%), 65 (32.18%) and 77 (38.12%) respectively. The mean haemoglobin was found 6.718 g/dL, 8.32 g/dL and 10.66 g/dL in severe anaemic, moderate anaemic and mild anaemic girls respectively.

Family Type	Total	Anaemic (%)	Non-Anaemic	X ² =5.0963 df- 1 p <0.05
Joint	68	58 (85.2%)	10	
Nuclear	134	95 (70.8%)	39	

Table 2: Distribution of Anaemic Subjects according to their Family Type

Table 2 shows that the prevalence of anaemia was 85.2% in adolescent girls who belong to joint family as compared to nuclear families where the prevalence of anaemia was 70.8%. And this finding was significant with reference to anaemia (p <0.05).

Adolescent Girls	Mean BMI (±SD)	±SE of BMI	Mean Height (±SD)	±SE of Height	Mean Weight (±SD)	±SE of Weight
Anaemic	17.74 (SD±1.199)	±0.0972	138.92 (SD±9.312)	±0.7532	34.47 (SD±5.677)	±0.4593
Non-Anaemic	18.17 (SD±1.310)	±0.1873	139.44 (SD±10.13)	±1.4434	35.68 (SD±6.780)	±0.9685

Table 3: Comparison of Anthropometric Measurement in Anaemic Subjects and Non-Anaemic Subjects

Observation of Table 3 shows that mean BMI, mean height (in cm) and mean weight (in kg) of anaemic adolescent girls are 17.74 (SD±1.199), 138.92 (SD±9.312) and 34.47 (SD±5.677) respectively.

Mother Education	Total No. of Girls	Anaemic (%)	Non-Anaemic	χ ² -17.651 df-4 p<0.05
Illiterate	84	72 (85.71%)	12	
Just Literate	48	37 (77.08%)	11	
Primary School (Class 1 to 5)	49	35 (71.42%)	14	
Middle School (Class 6 to 8)	13	6 (46.15%)	7	
High School (Class 9-12)	08	3 (37.5%)	5	
Total	202	153	49	

Table 4: Distribution of Anaemic Subjects according to their Mother's Education

It is seen from Table 4 that the prevalence of anaemia in adolescent girls was maximum in illiterate mothers (85.71%), and the least was found in high school educated mothers (37.5%). In the present study, graduate and postgraduate mothers were not found. And the finding was significant with reference to anaemia ($p < 0.05$).

Girls' Education	Total No. of Girls	Anaemic (%)	Non-Anaemic	$\chi^2-10.32$ df-3 $p < 0.05$
Illiterate	85	74 (87.05%)	11	
Primary School (Class 1 to 5)	54	37 (68.5%)	17	
Middle School (Class 6 to 8)	40	27 (67.5%)	13	
High School (Class 9 to 12)	23	15 (65.2%)	8	
Total	202	153	49	

Table 5: Distribution of Anaemic Subjects According to their Education

It appears from Table 5 that the percentage of anaemia was higher in illiterate girls (87.5%) and least percentage of anaemia was seen in high school going girls (65.2%). Just literate, graduate and above educated girls were not found in this study. And the relation was found statistically significant between girls' education and anaemia. ($\chi^2-10.32$, df-3, $p < 0.05$).

Socioeconomic Class	Total No. of Girls	Anaemic (%)	Non Anaemic	χ^2 16.662 df-4 $p < 0.05$
Class I	21	9 (42.85%)	12	
Class II	54	40 (74.07%)	14	
Class III	72	56 (77.7%)	16	
Class IV	37	32 (86.4%)	5	
Class V	18	16 (88.8%)	2	

Table 6: Distribution of Anaemic Subjects according to their Socioeconomic Status

It is clearly seen from Table 6 that the prevalence of anaemia is maximum in socioeconomic class V (88.8%) and minimum in socioeconomic class I (42.85%). And the relation was found statistically significant between socioeconomic status and anaemia ($p < 0.05$).

Socio-economic Class	Total No. of Girls	Total No. of Anaemic	Mild Anaemia (%)	Moderate Anaemia (%)	Severe Anaemia (%)
I	21	9	6 (28.6%)	3 (14.3%)	0
II	54	40	20 (37%)	19 (35.2%)	1 (1.9%)
III	72	56	35 (48.6%)	19 (26.4%)	2 (2.7%)
IV	37	32	11 (29.7%)	17 (45.9%)	4 (10.8%)
V	18	16	5 (27.7%)	7 (38.8%)	4 (22.2%)

Table 7: Distribution of Severity of Anaemia according to their Socioeconomic Status

From table 7, it can be observed that the percentage of severe anaemia was maximum (22.2%) in socioeconomic class 'V', and in the class 'I' there were no cases of severe anaemia. And the percentage of moderate anaemia was maximum (48.6%) in socioeconomic class 'IV' and maximum number 35 (48.6%) cases of mild anaemia were found in socioeconomic class III.

DISCUSSIONS

In the present study, the prevalence of anaemia among adolescent girls was 75.74%. Premalatha T et al, Devi S et al also found almost the similar prevalence of anaemia 78.75%, 73% respectively in their study.^[10,11] In other studies, Mallikarjuna M et al and Jawarkar AK et al reported lower prevalence of anaemia (56.3% and 55% respectively).^[12,13] However, a study by Chauhan AS et al reported higher prevalence of anaemia at 85.9% in adolescent girls.^[14] These differences in the prevalence of anaemia may be due to differences in the study area. Our study showed that the number of severe, moderate and mild anaemic girls are 11 (5.44%), 65 (32.18%) and 77 (38.12%) respectively. Thakur et al reported the prevalence of mild, moderate and severe anaemia among adolescent girls of hilly state was 42.3%, 38.9% and 3.2% respectively.^[15] In the present study, percentage of anaemia was higher (85.2%) in joint families than in nuclear families (70.8%). In another study, Agarwal AK also reported that anaemia was more in joint family.^[16] Our study showed that the mean BMI value of all selected adolescent girls were in Chronic Energy Deficiency (CED) grade I. Gupta N et al in a study of adolescent girls found that the mean BMI was 17.40 ± 2.78 kg/m² (CED-I).^[17] In another study, a significant association between mother's literacy and anaemia among adolescent girls was found, similar to our study.^[18] Our study shows that the percentage of anaemia was more in illiterate girls than in literate girls. Kulkarni MV et al. also documented similar results and prevalence of anaemia was found 83.7%, 87%, 92.3% and 93.1% in \geq graduate, Higher Secondary, Senior Secondary and primary & middle school educated girls respectively.^[5] This study shows that lower the socioeconomic status higher the prevalence of anaemia. Biradar SS et al in a study found that the prevalence of anaemia among the girls who belonged to class III was 4.1%, whereas it was 43.1% in girls of socioeconomic class IV and 100% in girls of socioeconomic class V.^[19]

CONCLUSION

In spite of the fact that anaemia is a preventable condition, it is highly prevalent among the adolescents all over India. More focus has been given to adolescent pregnancies and sexually transmitted diseases like HIV, but not much attention has been given towards nutrition. This study shows that the prevalence of anaemia is more in adolescent girls who belong to joint families. This could probably be due to both quality and quantity of food consumption which gets affected by number of members in the family. Educational status of mothers and adolescent girls has been found to have a significant association with anaemia. Low prevalence of anaemia in adolescent girls in more educated mothers and girls may be explained by their increased awareness regarding available health services leading to change in health seeking behaviour, personal hygiene and intake of adequate nutrition. The

socioeconomic status of girls has got a positive effect on anaemia. This may be because of better availability of high quality of food for their children due to their better socioeconomic status.

Strength

It is a population based cross sectional study and the strength of this study was that from this study it is possible to assess the burden of disease in this area. Bias was taken care of by random sampling. This study is expected to enhance the knowledge base and awareness regarding nutritional anaemia among study population and will also be useful in planning for future health programmes in this geographic area.

LIMITATIONS

In spite of our best efforts, it was difficult to convince all study subjects to participate in the study, for collection of samples was not welcomed in many cases. At times, elderly family members and/or female relatives were not present at their houses, and study subjects refused to cooperate in their absence. Repeated visits had to be made for such cases.

RECOMMENDATIONS

It was felt during the study that there is a need to improve female literacy, socioeconomic status of the masses through poverty alleviation programmes. Promotion of family planning measures too reduces the family size. Also important is nutritional education and personal hygiene in school curriculum.

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AN EPIDEMIOLOGICAL STUDY OF ANAEMIA AND ITS ASSOCIATED RISK FACTORS AMONG ADOLESCENT GIRLS IN RURAL AREA OF KATIHAR

Mohammad Intekhab Alam Chand¹, Mukesh Nandan², Akhil Bandhu Biswas³

¹Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

²Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

³Professor and Head, Department of Community Medicine, Katihar Medical College, Katihar, Bihar.

ABSTRACT

BACKGROUND

Anaemia is a serious public health concern in most developing countries and the prevalence of anaemia is quite high among adolescent girls. Adolescence is also a phase where a rapid upsurge is seen in growth and development which leads to increase requirement of nutrition especially high micronutrients requirement. Adolescent girls are vulnerable to iron deficiency and anaemia due to accelerated increase in requirements for iron, poor dietary intake of iron, prolonged menstrual period, and worm infestation. A study was conducted with the objective to determine the associated risk factors of anaemia among adolescent girls.

METHODS

A cross-section study was conducted among 202 adolescent girls in rural area of Katihar. Information was collected on a predesigned and pretested proforma about contributory factors in relation to anaemia, by oral questionnaire method. Sahli's haemoglobinometer was used for the haemoglobin estimation.

RESULTS

Prevalence of anaemia and severity of anaemia was found to be high in the age group 17 to 19. Prevalence of anaemia was significantly high (80%) in the adolescent girls who already attained menarche. A statistically significant relation exists between family size and anaemia. Percentage of anaemia was high among labour class (85%) than business class (61.7%). Prevalence of anaemia was to be found high in vegetarian (78.13%) than non-vegetarian (75.29%).

CONCLUSIONS

This study shows that the anaemia was to be found more prevalent in higher age group, vegetarian group, and girls who had already attained menarche. This may be because of repeated menstrual blood loss with each cycle and use of low bioavailability iron.

KEYWORDS

Anaemia, Adolescent Girl, Occupation, Menarche

HOW TO CITE THIS ARTICLE: Alam Chand MI, Nandan M, Biswas AB. An epidemiological study of anaemia and its associated risk factors among adolescent girls in rural area of Katihar. *J. Evid. Based Med. Healthc.* 2019; 6(31), 2117-2120. DOI: 10.18410/jebmh/2019/431

BACKGROUND

Adolescent girls are at a high risk for anaemia and malnutrition. Inadequate nutrition during adolescence can have serious consequences throughout the reproductive years of life and beyond.¹ It is a period of transition between childhood & adulthood, a time of profound biologic, intellectual, psychosocial and economic changes.² It has been defined by the World Health Organization as the period of life spanning the ages between 10-19 years. Adolescent girls need extra iron for menstruation, in addition to growth

and development. Iron deficiency anaemia impairs cognitive and behavioural development resulting in reduced school performance. Further, low iron stores throughout childhood may contribute to a delayed menarche and impaired immune response.³ Anaemia in adolescent girls attributes to high maternal mortality rate in future, high incidence of low birth weight babies and high perinatal mortality.⁴ According to WHO estimates approximately 50% of all anaemia is attributable to iron deficiency. Studies indicate that the incidence of anaemia in adolescents tends to increase with age and corresponds with the highest acceleration of growth during adolescence.⁵ In India, anaemia is the second most common cause of maternal deaths, accounting for 20% of total maternal deaths.⁶ Among adolescents girls, anaemia may lead to delayed menstrual cycle, poor growth, reduced work capacity and poor reproductive outcome. Demographic factors and socio-economic factors also play an important role on the health of adolescent girls. All these factors make adolescents more susceptible to anaemia. This study was planned to assess the magnitude of problem of anaemia in

Financial or Other, Competing Interest: None.

Submission 15-06-2019, Peer Review 23-06-2019,

Acceptance 10-07-2019, Published 05-08-2019.

Corresponding Author:

Dr. Mukesh Nandan,

Flat No. 10, Block No. 7,

Doctors Quarters,

Katihar Medical College,

Katihar, Bihar.

E-mail: drmukeshnandan@gmail.com

DOI: 10.18410/jebmh/2019/431



rural field practice area of Katihar Medical College, Katihar. The main objective of the study was to know the prevalence of anaemia and its associated risk factors among adolescent girls in this area.

METHODS

A community based cross sectional study was conducted at Hajipur village, a rural field practice area of Katihar Medical College, Katihar, Bihar. Initially, a pilot study was conducted among a small number of adolescent (10-19 years) girls in Hajipur village to have a rough estimate of the prevalence of anaemia. The prevalence was found to be 50 percent in this pilot study. On the basis of this, prevalence of anaemia was taken as 50%, the level of significance as 5%, the allowable error as 20% of prevalence and the design effect was 2. The sample size of the present study was calculated by adopting the following formula-

$$n = \frac{Z^2 \alpha \times PQ}{\Sigma^2}$$

$Z^2 \alpha / 2 = 1.96 = 2 (\text{at } \alpha = 0.05),$
 $P = \text{prevalence rate of the disease (here, } P = 50\%),$
 $Q = 1 - P, \Sigma = \text{Allowable error } 20\% \text{ of } P = 0.10, \Sigma^2 = 0.0100$

Then, $n = \frac{4 \times 0.50 \times 0.50}{0.0100} = 100$

Here, degree of confidence is 95% allowing design effect 2, $n = 100 \times 2 = 200.$

Houses were numbered serially where one or more adolescents were present. Total 583 houses were found where one or more adolescents were present. Then the houses were selected systematic random sampling technique where one or more adolescents were present. In this present study the total sample size was 202 adolescent girls. The necessary information regarding socio-demographic characteristic and risk factor related to anaemia were collected with the help of predesigned and pre tested questionnaire after taking written informed consent. A female attendant was present during the examination. Adolescents in the present study who were apparently healthy on general physical examination were included in this study. Adolescent Pregnant mothers were not included in this study. Blood haemoglobin examination was done with the Sahli's method in a Rural Health Training Centre. After testing Haemoglobin levels of all the study subjects, those with Haemoglobin level less than 12 were labelled as anaemic. The collected data was numerically coded and entered in Microsoft excel 2007 and then transferred to SPSS version 20. Chi Square (χ^2) was used for statistical analysis and P value <0.05 was considered significant.

RESULTS

The overall prevalence of anaemia was to be found to be 75.74% (153/202) among study subjects. On the basis of

severity nearly one third of subjects 38.12% (77/202) were found to be mild anaemic, 32.18% (65/202) of girls had moderate anaemia while 5.44% (11/202) girls were severely anaemic.

Age- Group (in Years)	Total	Anaemic	Non-Anaemic	% of Anaemia	χ^2 -7.133, df-2 p<0.05
10-13	91	61	30	67	
14-16	68	56	12	82.3	
17-19	43	36	7	83.7	

Table 1. Prevalence of Anaemia According to Age Group

From table-1 it can be observed that as age group increases the prevalence of anaemia also increases. The prevalence of anaemia was least in 10-13 years of age group and maximum in age group of 17-19. And it shows significant relation with anaemia. ($p < 0.05$).

Age Group in Years	Total no. of Girls	Total No. of Anaemic (%)	Mild Anaemia (%)	Moderate Anaemia (%)	Severe Anaemia (%)
10-13	91	61(67%)	35(38.4%)	24(26.3%)	2(2.1%)
14-16	68	56(82.3%)	30(44.1%)	22(32.3%)	4(5.8%)
17-19	43	36(83.7%)	12(27.9%)	19(44.1%)	5(11.6%)

Table 2. Severity of Anaemia According to Age Group

From this table it can be seen that the percentage of severe anaemia was found to be maximum (11.6%) in the age group of 17 to 19 years and least in (2.1%) in 10 to 13 years of age. And the percentage of moderate anaemia was found to be high in the age group of 14-16 years and minimum was to be found in age group 10 to 13 years.

Status of Menarche	No. of Girls	% of Girls	Anaemic	Non-Anaemic	% of Anaemia	Mean Age at Menarche (in Years)	χ^2 -4.490 df-1 p<0.05
Not Attained	62	30.6	41	21	66.12	12.47±	
Attained	140	69.3	112	28	80	1.064	

Table 3. Prevalence of Anaemia According to Status of Menarche

It appears from table-3, that out of 202 adolescent girls 62 (30.6%) girls had not attained menarche and 140(69.30) had attained menarche. Among girls who had not attained menarche, the prevalence of anaemia was 66.12% and among girls who had attained the menarche, prevalence of anaemia 80%. And the relation between status of menarche and anaemia was found statistically significant.

Family Size	Total No. Girls	% of Girls	Anaemia	Non-Anaemic	% of Anaemia	χ^2 -9.067 df-2 p<0.05
3-5	83	41.1	54	29	65	
6-7	82	40.5	67	15	81.7	
≥8	37	18.4	32	05	86.4	

Table 4. Prevalence of Anaemia According to Family Size

As can be seen from Table-5, 83(41.1%), 82(40.5%) and 37(18.4%) subjects belongs to family size 3-5, 6-7, and ≥8 respectively. And the prevalence of anaemia is 65%, 81.7% and 86.4% respectively.

Father's Occupation	Total No. Girls	% of Girls	Anaemic	Non-Anaemic	% of Anaemic	χ ² -9.728, df-3 p<0.05
Labour	80	39.6	68	12	85	
Private Service	50	24.7	39	11	78	
Agriculture	25	12.3	17	08	68	
Business	47	23.2	29	18	61.7	

Table 5. Prevalence of Anaemia According to Father's Occupation

In this table it can be observed that maximum number of anaemias was to be found in labour class and least number of anaemias was found in Business class. And it shows a significant relation with anaemia.

Dietary Habit	Total No. Girls	% of Girl	Anaemia	Non-Anaemic	% of Anaemia	χ ² -0.117 df- 1 p>0.05
Vegetarian	32	15.8	25	07	78.13	
Non-Vegetarian	170	84.2	128	42	75.29	

Table 6. Prevalence of Anaemia According to Dietary Habit

It appears from Table-7 that 32/202 girls (15.8%) were vegetarians, and out of this 25/32 (78.13) girls were found anaemia. And in non-vegetarians 75.29% girls were found anaemic. And the relation was not found significant. (p>0.05)

DISCUSSION

In the present study, 153 (75.74%) girls were found to be anaemic. Srivastava A et al, also found almost the similar prevalence of anaemia (69.2%) in his study.⁷ In the present study age of the girls was found to have a significant relation with anaemia. The prevalence of anaemia was 67%, 82.3% and 83.7% in the age group 10-13 years, 14-16 years and 17-19 years, respectively. So, it can be observed that as age increases the prevalence of anaemia also increases. This may be accounted for as repeated menstrual blood loss with each cycle and use of low bioavailability of iron which results in drainage of iron reserves ending in anaemia. We can also observe that the maximum number of mild anaemias was to be found in age group 10 to 13 years and the prevalence of severe anaemia was found to be minimum in this age group. The percentage of severe anaemia was found more (11.6%) in age group 17 to 19 years and least (2.1%) in 10 to 13 years of age. Singh R observed in a study that the prevalence of anaemia was 37.6% in the age group 15-18 years as compared to 35.4% in the age group 10-14 years.⁸ Present study shows a significant association between status of menarche and anaemia among adolescent girls. The prevalence of anaemia was found 66.12% (41/62 girls) and 80% (112/140 girls) in girls who had not attained the menarche and who had attained the menarche respectively. Kaur S et al.⁹ mentioned in their study that prevalence of anaemia in adolescent girls was to be found 60.4% for girls who had already attained the menarche as compared to 56.25% for girls who had not attained the menarche. A statistically significant relation exists between family size and anaemia. The prevalence of anaemia was 65%, 81.7% and 86.4% in family size 3 to 5, 6 to 7 and ≥8 respectively.

Prevalence of anaemia increases as the size of family increases; this may be because of both quality and quantity of food consumption gets affected by number of member in the family especially with limited income sources. Dutta V et al. documented in a study that family size were significantly (p<0.01) associated with anaemia in adolescent girls.¹⁰ In the present study father's occupation has been found a significant relation with anaemia. Higher prevalence of anaemia was to be found in those adolescent girls whose father were working as labourers (85%) and least percentage of anaemia was found in businessmen (61.7%), probably because they were able to give better quality, quantity of food and life to the children. Singh R, in a study found that the prevalence of anaemia was maximum 48.1% in adolescent girls whose fathers worked as labourers while it was 41.8% in private service, 27.5% in business, 38.4% in government service and minimum 17.8% in professionals (p<0.005).⁸ A non-significant relation has been found between Dietary habit and anaemia. Prevalence of anaemia was found more in vegetarian group (78.13%) compare to non-vegetarian group (75.29%), because in India people take predominantly cereal based diet, rich in phytate, oxalates, phosphates, fiber and other inhibitors of iron absorption. Thakur A et al. also quoted that vegetarians were more anaemic than non-vegetarian.¹¹

CONCLUSIONS

WHO has suggested that the problem of anaemia is of very high magnitude in a community when prevalence rate exceeds 40%. In the present study 75.74% prevalence considered serious calls for an action. Effective public health intervention is needed to address the problem of anaemia in adolescent girls. Present study shows that age, status of menarche, father's occupation, family size, and dietary habits are the various risk factors which contribute to the prevalence of anaemia among adolescent girls. So, it is not feasible to single out any particular factor affecting anaemia in adolescent girls. It was felt during the study that there is need to promote family planning measures to reduce the family size and nutrition education to improve dietary intake in the family.

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Bacteriological Profile and Antibiogram of Blood Culture Isolates from Septicaemic Neonates and Children up to 10 Years of Age, in a Tertiary Care Centre of Eastern Bihar in India

Priyanka Paul Biswas¹, Kahkashan Akhter², Aninda Sen³, Umesh⁴, Mohammad Intekhab Alam Chand⁵

^{1, 2, 3} Department of Microbiology, Katihar Medical College, Al-Karim University, Katihar, Bihar, India.

⁴ Department of Microbiology, Government Medical College Haldwani, Uttarakhand, India. ⁵ Department of Community Medicine, Katihar Medical College, Al-Karim University, Katihar, Bihar, India.

ABSTRACT

BACKGROUND

This study was an attempt to find the association of physical parameters, risk factors, common signs & symptoms of septicaemia, analyse the distribution of microorganisms isolated from clinically suspected cases of septicaemia, and collect their antibiogram. We also wanted to evaluate the haematological findings in conventional culture, correlate them to the sensitivity and specificity, and quantitatively identify the relevance of these haematological tests through their positive and negative predictive values.

METHODS

A total of 350 blood samples were received from patients with clinically suspected cases of blood stream infections (BSI) at the Department of Microbiology for routine culture & sensitivity and were processed using standard microbiological techniques to determine the percentage distribution of bacterial pathogens causing BSI and their antibiotic susceptibility patterns. Mueller-Hinton agar (MHA) with 4 % NaCl was used to detect methicillin resistance.

RESULTS

Of the 350 septicaemic cases, 58.8 % were from neonatal ICU and 41.2 % were from paediatric wards. Maximum culture positivity (45.3 %) was seen in < 28 days age group. Bacterial growth was seen in 62.0 % preterm babies. Probability of sepsis was more with leukopenia (85.4 %) as compared to leucocytosis (68.9 %); positive C-reactive protein (CRP) findings (63.8 %) were more likely to be associated with sepsis as compared to negative CRP findings (2.1 %). Leukopenia (97.5 %) and leucocytosis (96.3 %) had the highest specificity values.

CONCLUSIONS

Low birth weight (LBW) neonates, preterm birth and Caesarean section deliveries are risk factors that predispose neonates to septicaemia. Meropenem can be used in septaemia, but it should be reserved for critical cases, particularly those with multidrug resistant (MDR) bacteria, rather than on routine basis to prevent inadvertent promotion of bacterial resistance. This study showed that leukopenia and CRP are good indicators of sepsis, when used in combination.

KEYWORDS

Blood Stream Infection, Early Onset Septicemia, Late Onset Septicemia

Corresponding Author:

*Dr. Mohammad Intekhab Alam Chand,
Assistant Professor,
Department of Community Medicine,
Katihar Medical College,
Al-Karim University, Katihar - 854 106,
Bihar, India.*

E-mail: academicskmc@gmail.com

DOI: 10.18410/jebmh/2021/172

How to Cite This Article:

*Biswas PP, Akhter K, Sen A, et al.
Bacteriological profile and antibiogram of
blood culture isolates from septicaemic
neonates and children up to 10 years of
age, in a tertiary care centre of eastern
Bihar in India. J Evid Based Med Healthc
2021;8(14):882-887. DOI:
10.18410/jebmh/2021/172*

Submission 07-12-2020,

Peer Review 20-12-2020,

Acceptance 16-02-2021,

Published 05-04-2021.

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BACKGROUND

Risk factors predisposing to neonatal septicemia in developing countries include prolonged rupture of membranes, prematurity, birth asphyxia, length of hospital stay, invasive procedures, delivery location, material used in cutting & dressing cord and maternal infections during pregnancy.^{1,2}

The present study was conducted to find out the association of physical parameters & risk factors to clinically suspected septicemia cases; and to see the distribution of microorganisms isolated from cases of sepsis among preadolescent children including newborns, and to collect their antibiogram.

The study also reports the haematological findings in conventional culture and tries to correlate them to the level of accuracy (sensitivity and specificity) with which they were seen to be associated with sepsis.

METHODS

This cross-sectional study was carried out in the Department of Microbiology of a tertiary care centre in Eastern Bihar, in India from May 2019 to November 2020. All patients admitted to the Pediatrics Department of the tertiary centre, with signs of sepsis were included in the study. Clearance was obtained before conducting the study vide IEC / Dept. Res. / 005 / 2019 - 2022 (Microbiology) dated 20.04.2019.

Study Population

Study population was calculated based on a total number of 840 samples received during the study period and calculated on the basis of confidence level of 95 %, and a confidence interval of 4.0. Based on the calculations, a total of 350 blood samples from clinically suspected cases of blood stream infection (BSI) were chosen by simple random sampling and processed for routine blood culture and antibiotic sensitivity, preferably during fever spikes before beginning empirical antibiotic therapy. The study population included all neonates, with age < 28 days to children up to 10 years of age.

Isolation & Identification

The blood culture bottles containing specimens were transported within half an hour to the bacteriology laboratory, incubated at 35⁰ C for 7 days and examined macroscopically for appearance of turbidity as evidence of growth during the first 12 - 18 hours after collection. Subcultures were examined for growth on next day. If there was any growth, the isolates were identified as per standard protocol based on standard protocol. If there was no growth, further subculture was done on the 2nd, 4th and the 6th day. Cultures were reported negative, if subcultures showed no growth by then.³

Antimicrobial Susceptibility Testing

Antibiotic susceptibility testing was done by Kirby-Bauer disc diffusion method on Muller-Hinton agar, using antibiotic discs obtained from HiMedia Laboratories, Mumbai, India. Blood agar was used for *Streptococcus pneumoniae*.⁴

Data Analysis

Performance indices were calculated for haematological parameters like (leukopenia, leukocytosis and CRP). Variables measured were the number of true positives (TP), true negatives (TN), false positives (FP) and false negatives (FN). Sensitivity was calculated as TP / (TP + FN), specificity was calculated as TN / (TN + FP), the PPV was calculated as TP / (TP + FP) and NPV was calculated as TN / (TN + FN).

Statistical Analysis

Statistical analysis of data was done using the online application available at the website link http://www.physics.csbsju.edu/stats/contingency_NROW_NCOLUMN_form.html.

RESULTS

A total of 350 blood cultures were performed during the study period, out of which, 206 (58.8 %) were from neonatal ICU and the remaining 144 (41.2 %) were from the pediatric ward. Majority (145 / 350; 41.4 %) of the children belonged to the age group < 28 days (Table 1). Of the clinically suspected septicaemic cases of neonates, 58.5 % (205 / 350) were males and 41.4 % (145 / 350) were females. The overall male to female ratio was 1: 0.71 (Table 1).

Out of all the culture positive septicaemic cases, maximum culture positivity was seen in low birth weight (LBW) neonates (49.1 %; 53 / 108). Culture positivity in normal birth weight (NBW) neonates was lower (26.8 %; 29 / 108). Maximum bacterial growth was seen in preterm babies (62.0 %; 67 / 108) as compared to the term babies (37.9 %; 41 / 108) (Table 2).

Place of delivery seemed to be the major risk factor and majority of cases (50.9 %; 55 / 108) suffered from sepsis among children whose records showed that they were born in other institutions. It was much lesser when the delivery was in our hospital (31.5 %; 34 / 108), and the least during planned and attended home deliveries (17.5 %; 19 / 108) (Table 2).

Children born of Caesarian sections appeared to be more at risk of BSI (78.7 %; 85 / 108), as compared to those born through normal deliveries (21.3 %; 23 / 108) (Table 2).

The observed values in relation to birth weight (P < 0.001), gestational age (P < 0.001) and place of delivery (P < 0.001) were all statistically significant, while the P-value for the mode of delivery (P > 0.05) was statistically insignificant (Table 2).

Of the total 350 blood samples cultured, 184 (52.6 %) were sterile, 108 (30.9 %) showed growth of various bacteria, 20 (5.7 %) were candida species positive and 38 (10.9 %) showed growth of contaminants. Among positive

blood culture isolates, the gram-positive bacterial isolates (47.2 %; 51 / 108) marginally exceeded the gram-negative isolates (45.3 %; 49 / 108).

Isolation of gram-positive cocci (GPC) (64.4 %; 38 / 59) and fungi (8.4 %; 5 / 59) were more (26.5 %; 13 / 49) from late onset septicaemia cases (LOS) and lower (67.3 %; 33 / 49) in early onset septicemia (EOS) (Table 3).

The predominant signs and symptoms were poor activity / poor feeding (53.1 %; 186 / 350), followed by fever (21.7 %; 76 / 350), vomiting (8.2 %; 29 / 350) and convulsions (6.5 %; 23 / 350).

Gram negative bacilli (GNB) showed maximum resistance to cefuroxime, cotrimoxazole & piperacillin-tazobactam, being 76.3 % (29 / 38) each. Most of the GNB were found to be sensitive to colistin (65.7 %; 25 / 38), followed by meropenem (42.1 %; 16 / 38), amikacin (39.4 %; 15 / 38) and netilmicin (34.2 %; 13 / 38); (Table 4).

Pseudomonas aeruginosa showed maximum resistance to cefotaxime (100.0 %; 11 / 11) followed by netilmicin, nalidixic acid & piperacillin-tazobactam (90.9 %; 10 / 11, each) and aztreonam & gentamicin (81.8 %; 9 / 11, each) (Table 4).

GPC showed maximum resistance to aztreonam (68.6 %; 35 / 51), followed by meropenem & cotrimoxazole (64.7 %; 33 / 51, each), and erythromycin (58.8 %; 30 / 51). Resistance to vancomycin was shown by 33.3 % (17 / 51) isolates. Only 39.2 % (20 / 51) isolates showed resistance to ceftazidime (Table 4).

Routine haematological investigation profile was recorded and analysed as shown in (Table 5), which depicts that probability of sepsis is more with leukopenia (85.4 %; 35 / 41), as compared to leucocytosis (68.9 %; 20 / 29). Also, positive C-reactive protein (CRP) finding (63.8 %; 104 / 163) was more likely to be associated with sepsis as compared to negative CRP finding (2.1 %; 4 / 187).

Comparison of sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of various haematological parameters showed, CRP had the highest sensitivity (96.3 %) and negative predictive value (NPV)

(97.9 %), leucopenia (97.5 %) and leucocytosis (96.3 %) had the highest specificity values (Table 5).

Physical Parameters	Sepsis						Chi-Square X ²	'P' Value	
	Culture Positive		Culture Negative		Total Cases				
	N	%	N	%	N	%			
Gender	Male	63	58.3	142	58.6	205	58.5	0.365	0.952
	Female	45	41.6	100	41.6	145	41.4		
	Total	108	100	242	100.0	350	100.0		
Age	< 28 days	49	45.3	96	39.6	145	41.4	10.7	0.014
	28 days to 1 yr.	27	25.0	56	23.1	83	23.7		
	1 yr. to 5 yrs.	19	17.5	77	31.8	96	27.4		
	5 yrs. to 10 yrs.	13	12.1	13	5.3	26	7.4		
	Total	108	100.0	242	100.0	350	100		
	Age (Mean + SE)	1.583 + 0.235		1.498 + 0.124		--	--		

Table 1. Association between Physical Parameters and Sepsis

Risk Factors	Parameters	Sepsis						Chi-Square X ²	'P' Value
		Culture Positive		Culture Negative		Total Cases			
		No.	%	No.	%	No.	%		
Birth weight	VLBW#	26	24.1	5	2.1	31	8.9	67.5	0.000*
	LBW##	53	49.1	78	32.2	131	37.4		
	Normal	29	26.8	159	65.7	188	53.7		
	Total	108	30.8	242	69.1	350	100.0		
Gestation	Term	41	37.9	202	83.5	244	69.7	73.3	0.000*
	Pre term	67	62.0	40	16.5	107	30.5		
Place of delivery	Total	108	30.8	242	69.1	350	100.0	25.1	0.000*
	Other institution	55	50.9	74	30.5	129	36.8		
	Own institution	34	31.5	146	60.3	180	51.4		
	Home delivery	19	17.5	22	9.1	41	11.7		
Mode of delivery	Total	108	30.8	242	69.1	350	100.0	1.41	0.236
	CS###	85	78.7	176	72.7	261	74.5		
	ND****	23	21.3	66	27.3	89	25.4		
Total		108	30.8	242	69.1	350	100.0		

Table 2. Association of Clinically Suspected Cases by Risk Factor

#VLBW = Very Low Birth Weight, ## LBW = Low Birth Weight, ###CS = Caesarian Section, ****ND = Normal Delivery, *indicates significant statistical association at P < 0.05

Organism Type	Onset of Septicemia		
	EOS* N (%)	LOS** N (%)	Total N (%)
Gram positive	13 (26.5)	38 (64.4)	51 (47.2)
Gram negative	33 (67.3)	16 (27.1)	49 (45.3)
Fungi	3 (6.2)	5 (8.4)	8 (7.4)
Total	49	59	108

Table 3. Organism Type vs. Onset of Septicaemia

*EOS = Early Onset Septicemia, ** LO = Late Onset Septicemia, *indicates significant statistical association at P < 0.05

Antimicrobial	GNB (N = 38)		<i>Pseudomonas aeruginosa</i> (N = 11)		GPC (N = 51)	
	Resistant (%)	Sensitive (%)	Resistant (%)	Sensitive (%)	Resistant (%)	Sensitive (%)
Amikacin	15 (39.4)	15 (39.4)	7 (63.6)	6 (54.5)	11 (21.5)	31 (28.7)
Amoxicillin	26 (68.4)	12 (31.5)	-	-	23 (45.0)	19 (37.3)
Aztreonam	28 (73.6)	10 (26.3)	9 (81.8)	6 (54.5)	35 (68.6)	16 (31.3)
Cefazolin	-	-	-	-	15 (29.4)	31 (60.7)
Cefotaxime	23 (60.5)	7 (18.4)	11 (100.0)	2 (18.2)	-	-
Ceftazidime	-	-	-	-	20 (39.2)	31 (60.7)
Cefuroxime	29 (76.3)	6 (15.7)	-	5 (45.4)	-	-
Ciprofloxacin	24 (63.1)	9 (23.6)	8 (72.7)	7 (63.6)	29 (56.8)	19 (37.2)
Clindamycin	-	-	-	-	15 (29.4)	23 (45.0)
Colistin	13 (34.2)	25 (65.7)	5 (45.4)	10 (90.9)	-	-
Cotrimoxazole	29 (76.3)	16 (42.1)	5 (45.4)	5 (45.4)	33 (64.7)	12 (23.5)
Erythromycin	-	-	-	-	30 (58.8)	20 (39.2)
Gentamicin	20 (52.6)	8 (21.0)	9 (81.8)	2 (18.2)	16 (31.3)	24 (47.0)
Imipenem	22 (57.8)	11 (28.9)	7 (63.6)	5 (45.4)	-	20 (39.2)
Levofloxacin	20 (52.6)	11 (28.9)	5 (45.4)	10 (90.9)	-	-
Linezolid	-	-	-	-	9 (17.6)	34 (66.6)
Meropenem	19 (50.0)	16 (42.1)	7 (63.6)	8 (72.7)	33 (64.7)	18 (35.3)
Nalidixic acid	28 (73.6)	10 (26.3)	10 (90.9)	5 (45.4)	16 (31.3)	35 (68.6)
Netilmicin	25 (65.7)	13 (34.2)	10 (90.9)	5 (45.4)	25 (49.0)	20 (39.2)
Piperacillin-tazobactam	29 (76.3)	9 (23.6)	10 (90.9)	5 (45.4)	-	-
Vancomycin	-	-	-	-	17 (33.3)	26 (50.9)

Table 4. Antimicrobial Susceptibility Pattern of Organisms Isolated from Septicaemic Cases

Haematological Parameter Variants	Parameter Present (P) / Absent (A)	Conventional Culture		Total N = 350	Positivity (%)	Sensitivity	Specificity	PPV	NPV
		Positive (N = 108)	Negative (N = 242)						
Abnormal leukocyte count	P	43 (TP)	27 (FP)	70	61.4	74.1 %	88.8 %	61.4 %	93.5 %
	A	65 (FN)	215 (TN)						
Leucopenia (< 5000 / mm ³)	P	35 (TP)	6 (FP)	41	85.4	32.4 %	97.5 %	85.4 %	32.4 %
	A	73 (FN)	236 (TN)						
Leucocytosis (> 20,000 / mm ³)	P	20 (TP)	9 (FP)	29	68.9	18.5 %	96.3 %	68.9 %	72.6 %
	A	88 (FN)	233 (TN)						
Platelet count (< 100000 / dl)	P	49 (TP)	110 (FP)	159	30.8	45.4 %	54.6 %	30.8 %	69.1 %
	A	59 (FN)	132 (TN)						
C-reactive protein (positive, > 6 mg / dl)	P	104 (TP)	59 (FP)	163	63.8	96.3 %	75.6 %	63.8 %	97.9 %
	A	4 (FN)	183 (TN)						
C-reactive protein (negative, < 6 mg / dl)	P	4 (TP)	183 (FP)	187	2.1	3.7 %	24.4 %	2.1 %	36.2 %
	A	104 (FN)	59 (TN)						

Table 5. Evaluation of Haematological Parameters with Conventional Culture Positivity

DISCUSSION

The present study was an attempt to find out the association of physical parameters & risk factors to clinically suspected cases of septicaemia; the common signs & symptoms associated with clinical suspicion of septicaemia; and to analyse distribution of microorganisms isolated from cases of neonatal sepsis and collect their antibiogram. The study also reports the haematological findings in conventional culture and to correlate them to the level of accuracy (sensitivity and specificity) with which they were seen to be associated with sepsis and to quantitatively identify the relevance of these haematological tests through their PPV and NPV.

Out of the total clinically suspected cases of neonates, 58.5 % (205 / 350) were males and 41.4 % (145 / 350) were females. Among the males, culture positivity was 58.3 % (63 / 108) and for females it was 41.6 % (45 / 108). This was comparable to the other studies.⁵ The reason for male preponderance is unknown, but could be due to gender-dependent factors.

In the present study, the total number of LBW babies were 37.4 % (131 / 350) clinically suspected neonates, amongst which culture positivity was seen in 49.1 % (53 / 131) cases. This finding was close to the outcome of the study conducted by other workers, where clinical sepsis was more commonly associated with LBW newborns (60 %).⁶

Our study shows that out of the total of 350 blood samples that were cultured, around half the samples (52.6 %; 184 / 350) were sterile. 30.9 % (108 / 350) samples showed growth of various pathogenic bacteria, while 5.7 % (20 / 350) were candida species positive. Other studies have reported similar findings earlier, where the growth of pathogenic bacteria was seen in 29.5 % samples, while 63.8 % showed no growth after 7 days of incubation.⁷ Contrasting findings of both bacteraemia (88.9 %) and fungemia (11.1 %) in higher percentages of infected individuals have also been reported.⁸ Low blood culture isolation rate in the current study might be due to prior treatment through antibiotics before blood collection either to the mother or to the baby ; or the possible infection of neonates with viruses, other fungi or anaerobes, which cannot be ruled out, but were not detected in the present study.^{9,10,11}

The present study results showed 9.7 % (34 / 350) growth of contaminants in the cultures. The common contaminants were bacillus species, micrococcus species,

and diphtheroids. In contrast, other studies have reported bacillus species and micrococcus species (37.0 % each), *Staphylococcus epidermidis* (14.8 %) and diphtheroids (11.1 %) as contaminants.¹²

Findings of other studies reported predominance of gram-negative isolates like acinetobacter species, enterobacter species and salmonella species In BSI.¹³ Among the gram positive pathogens, coagulase-negative staphylococci (CoNS) and *Staphylococcus aureus* were the most common isolates in our study. A higher prevalence rate of septicaemia was recorded by other workers, due to GNB (67.5 %), than due to gram-positive bacteria (32.5 %).

It was found in our study that, while gram positive bacterial pathogens contributed more to LOS (64.4 %), gram negative pathogens contributed more to EOS (67.3 %). This finding was close to findings of some other studies where LOS was most common, with CoNS as the predominant gram-positive pathogen (67.6 %), while gram negative isolates were predominant in EOS.¹⁴

Regarding the physical status of neonates at the time of presentation, our study showed that slightly more than half the neonates (53.1 %; 186 / 350) presented with poor activity / poor feeding, fever (21.7 %; 76 / 350), vomiting (8.3 %; 29 / 350) and convulsions (6.6 %; 23 / 350). A study in South India reported 72 % cases with poor activity / poor cry, followed by 10.67 % with respiratory distress and 8 % with convulsions in their study.¹⁵

In our study, gram negative isolates showed maximum sensitivity to colistin (65.7 %), followed by meropenem (42.1 %), amikacin (39.4 %) and netilmicin (34.2 %). On the other hand, *Pseudomonas aeruginosa*, though a gram-negative bacteria, showed maximum sensitivity to levofloxacin and colistin (90.9 %, each), followed by meropenem (72.7 %) and ciprofloxacin (63.6 %). In a different study, all the gram-positive pathogenic isolates were sensitive to linezolid, tigecycline and vancomycin. Isolates were also sensitive to cotrimoxazole (78.8 %), ceftriaxone (77 %), azithromycin (76.9 %), cefepime (60 %), erythromycin (59.6 %) & clindamycin (53.9 %).¹⁶

Sensitivity to isolates appears to vary greatly from one place to another and is likely to be a result of local antibiotic pressure which, in turn, is influenced by local prescription practices. An Italian study reported varied isolate specific drugs to treat neonatal BSI, wherein *Escherichia coli* was highly sensitive (100 %) to amikacin, klebsiella to ciprofloxacin (100 %), enterobacter to cotrimoxazole (90 %)

& ciprofloxacin (88.9 %) and group B streptococci to ampicillin.

In our study leukopenia was associated with a greater probability of sepsis (85.4 %). This is in concordance with studies which showed a 42 % blood culture positivity rate with leukopenia and only a 29 % culture positivity rate in cases with total leucocyte count (TLC) > 5000 / cu mm.¹⁷

Abnormal TLC was seen in 61.4 % cases, while thrombocytopenia was seen in 69.1 % cases in the present study. These findings were not concordant with reports of some authors, who showed a higher percentage of abnormal TLC, and much lower percentage of thrombocytopenia.¹⁸ This wide difference in the haematological findings can be attributed to the methodologies while performing the tests.

In our study, leucocytosis had a high specificity (96.3 %) and low sensitivity (18.5 %) which means that it is more accurate in excluding sepsis. Its PPV was high (68.9 %) indicating that the probability of sepsis in subjects with leucocytosis was high. CRP also had the highest sensitivity (96.3 %) amongst all tests, meaning that in comparison to leucocytosis and leukopenia, CRP can identify those with sepsis more accurately.

Our study showed that WBC count < 5000 / cu mm was found to have a specificity of 97.5 %, but sensitivity of 32.4 %. Other findings showed that leucocytosis had an NPV of 72.6 %. CRP had a high NPV (97.9 %) and the lowest PPV (63.8 %). In a different study, a WBC count < 5000 / cu mm was found to have a specificity of 94 % but a sensitivity of only 50 %.¹⁹ In yet another study, sensitivity, specificity, NPV and PPV for leucopenia were 22 %, 68 %, 29 % and 59 % respectively.²⁰

CONCLUSIONS

LBW neonates, preterm birth, and Cesarean section deliveries are risk factors that predispose neonates to septicaemia. Meropenem can be used in septicaemia, but it should best be reserved for critical cases when patient does not respond to other antibiotics particularly in case of MDR bacteria, rather than on routine basis to prevent inadvertent promotion of bacterial resistance. This study showed that leukopenia and CRP are good indicators of sepsis, when used in combination.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

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Original Research Article

An observational study on Prevalence and various risk factors of Anaemia in Pregnant Women in rural area of District Katihar, Bihar, India

Authors

Dr Urmi Poddar¹, Dr Mukesh Nandan², Dr Prawin Chandra³, Dr Vishal Prasad⁴

^{1,4}Post Graduate Trainee, Department of Community Medicine, Katihar Medical College, Katihar, Bihar India

²Assistant professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India

³Associate professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India

Corresponding Author

Dr Mukesh Nandan

Assistant Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India

Contact: +91 9654284329, Email: drmukeshnandankmc@gmail.com

Abstract

Objectives: This study was to evaluate the prevalence and risk factors of anaemia in pregnancy in rural area of Katihar, Bihar, India.

Methodology: Total 120 pregnant women in any trimester of pregnancy with irrespective Iron and Folic Acid (IFA) consumption and belonged from rural areas of Katihar, Bihar, were enrolled in this study. A detail history, complete examinations and relevant investigations were performed to all cases. A Laboratory estimation of haemoglobin was performed using Sahli's (Acid haematin) method for haemoglobin estimation. Anaemia was classified as per the World Health Organisation (WHO) grading criteria.

Results: Data was analyzed by using simple statistical methods with the help of MS-Office software.

Conclusions: Anaemia in pregnancy was commonly seen in age 20 to 30 years. Most of the cases had mild anaemia in rural area of district Katihar. Parity > 3, pregnancy interval 2-3, illiteracy, lower socioeconomic status was major predictors of anaemia in pregnancy. Hence, anemia continues to be a major public health problem in rural area. To reduce the prevalence, there is a need to public health education on reproductive health, improve the dietary level and strength health care seeking behavior of women. Strategic efforts are needed to broaden the coverage of iron and folic acid distribution and its consumption.

Keywords: Anaemia, Prevalence, Risk factors.

Introduction

Anaemia during pregnancy is a public health problem especially in developing countries and is associated with adverse outcomes in pregnancy^[1].

According to the 2008 World Health Organization (WHO) report, anaemia affected 1.62 billion (24.8%) people globally^[2]. It had an estimated global prevalence of 42% in pregnant women and

is a major cause of maternal mortality^[3,4]. Sub-Saharan Africa is the most affected region, with anaemia prevalence estimated to be 17.2 million pregnant women, which corresponds to approximately 30% of total global cases^[5]. There is an increased iron requirement during pregnancy due to greater expansion in plasma volume that results in a decrease in haemoglobin (Hgb) level to 11g/dl. Therefore, any Hgb level below 11g/dl in pregnancy is considered as anaemia^[5,6]. Anaemia could be classified as mild, moderate and severe. The Hgb level for each class of anaemia in pregnancy are 10.0–10.9g/dl (mild), 7–9.9g/dl (moderate) and <7g/dl (severe)^[7]. When the Hgb value is adjusted for the altitude, anaemia in pregnancy is <11g/dl, 11.2 g/dl, 11.5 g/dl, 11.8 g/dl, 12.5 g/dl, 12.9 g/dl and 13.7g/dl for <1000, 1000-1999, 2000-2499, 2500-2999, 3000-3499 and 3500-3999 meter above sea level, respectively^[8].

Anemia is known to be associated with multiple factors, such as poor socioeconomic status, high parity, short birth interval, poor diet both in quantity and quality, lack of health and nutrition awareness, and a high rate of infectious diseases and parasitic infestations. In developing countries, underprivileged people have often limited access to medical care and preventive measures, increasing their risk of becoming anemic and contributing to high maternal mortality.^[9,10] Aim of our study was to evaluate the factors and prevalence of anaemia in pregnancy in small rural area of District Katihar, Bihar, India.

Materials & Methods

This present study was conducted in department of Community Medicine, Katihar Medical College and Hospital, Katihar, Bihar, India. Data was collected from patients attending Out Patient Department in department of Gynaecology and with collaboration of Department of Pathology in Katihar Medical College and Hospital, Bihar during a period from September 2017 to March 2018. Attendants/patients signed an informed consent approved by institutional ethical

committee of Katihar, Medical College, Katihar, Bihar India was sought.

Methods

A total of 120 pregnant women in any trimester of pregnancy irrespective of Iron and Folic Acid (IFA) consumption with age group <20 to >30 years were enrolled in this study. All pregnant women, who belonged from rural areas were included.

A detail history, complete examinations and relevant investigations were performed to all cases. Study Details: Data collection involved 120 participants in any trimester of pregnancy irrespective of Iron and Folic Acid (IFA) consumption. Participants were interviewed using a predesigned and pretested interview schedule. This was followed by a short clinical examination for pallor. A Laboratory estimation of haemoglobin was performed using Sahli's (Acid haematin) method for haemoglobin estimation. Anaemia was classified as per the World Health Organisation (WHO) grading criteria.

Haemoglobin level below the cut-off of 11 g/dL was used to label a pregnant woman as anaemic and it was further classified as: Mild anaemia (10-10.9 g/dL), Moderate anaemia (7-9.9 g/dL) and Severe anaemia (<7 g/dL).

Statistical Analysis

Data was analyzed by using simple statistical methods with the help of MS-Office software.

Observations

This study was conducted in department of Community Medicine, Katihar Medical College, Katihar, Bihar.

Table.1 Age wise distribution of anaemia in pregnancy.

Age (years)	Anaemic	Non-anaemic	Total
<20	34(35.79%)	2(8%)	36(30%)
20-25	50(52.63%)	15(60%)	65(54.16%)
26-30	4(4.21%)	4(16%)	8(6.67%)
>30	7(7.37%)	4(16%)	11(9.17%)
Total	95(100%)	25(100%)	120(100%)

In this present study, majority of cases 65 (54.16%) were in age group of 20-25 years. Out of total 120 cases, 95(79.16%) were anaemic and 25(20.83%) non-anaemic. Majority of anaemic pregnant women 50(52.63%) and non-anaemic 15 (60%) were belonged in age group of 20-25 years.

Table 2 Classification of anaemia in pregnant women

Hb (< 11g/dl)	No. of pregnant women	Percentage
Mild anaemia	68	56.66%
Moderate anaemia	27	22.5%
Severe anaemia	0	0%
Non anaemic	25	20.83%
Total	120	100%

In this present study, out of total 120 cases of pregnant women, 25(20.83%) cases were non-anaemic, majorities of pregnant women 68 (56.66%) were mild anaemic and 27(22.5%) were moderate anaemic, and no cases had severe anaemia.

Table.4. Parity in anaemic pregnant women

Parity	Anaemic(N=95)	Non anaemic (N=25)	Total(N=120)
<1	23(24.21%)	18(72%)	41(34.17%)
1-3	30(31.58%)	2(8%)	32(26.67%)
>3	42(44.21%)	5(20%)	47(39.16%)

Out of 120 pregnant women, majorities of cases 47(39.16%) were parity >3. Out of total 25 non-anaemic cases, majority 18(72%) were parity <1.

Table 5 Interval between pregnancies

Interval between pregnancies (years)	Anaemic (N=95)	Non-anaemic (N=25)	Total (N=120)
1-2	25(26.31%)	1(4%)	26(21.67%)
2-3	42(44.21%)	7(28%)	47(39.16%)
>3	3(3.16%)	2(8%)	5(4.16%)

Majorities of anaemic and non-anaemic pregnant women were 2-3 years of interval of pregnancies.

Table 6 Consumption s of IFA tablets in anaemic pregnant women.

Consumption of IFA tablets (100 or more)	Anaemic (N=95)	Non- anaemic (N=25)	Total(N=120)
Yes	33(34.73%)	13(52%)	46(38.33%)
No	62(65.26%)	12(48%)	74(61.67%)

In this present study, out of total 120 cases, majorities of cases 74(61.67%) were not taken IFA tablets. Majority 13(52%) of non-anaemic cases were regularly taken IFA tablets.

Table.7 Literacy of anaemic pregnant women

Education	Anaemic (N=95)	Non-anaemic (N=25)	Total (N=120)
Illiterate	57(60%)	9(36%)	66(55%)
Primary	23(24.21%)	4(16%)	27(22.5%)
Secondary	13(13.68%)	6(24%)	19(15.83%)
Higher secondary	1(1.05%)	2(8%)	3(2.5%)
Graduation	1(1.05%)	2(8%)	3(2.5%)
Post graduation	0	1(4%)	1(0.83%)

In this present study, most of pregnant women 66(55%) were illiterate.

Table 8 Type of family of pregnant women.

Type of family	Anaemic (N=95)	Non-anaemic (N=25)	Total (120)
Nuclear	31(32.63%)	7(28%)	38(31.67%)
Joint	64(67.37%)	18(72%)	82(68.33%)

Most of the cases 82(68.33%) were belonged to joint family. Anaemia was also commonly found in joint family.

Table 9 Socioeconomically status of anaemic pregnant women.

Socio-economical	Anaemic (N=95)	Non anaemic (N=25)	Total (N=120)
Lower	52(54.74%)	4(16%)	56(46.67%)
Middle	38(40%)	13(52%)	51(42.5%)
Higher	5(5.26%)	8(32%)	13(10.83%)

In this present study, most of the cases 56 (46.67%) were belonged in lower socio-economical status. Anaemic pregnant women were commonly found in lower socio-economical status.

Discussion

Anaemia is one of the most prevalent nutritional deficiency problems affecting pregnant women. The prevalence of anaemia in pregnancy differs significantly because of variations in socioeconomic conditions, lifestyles, and health-seeking behaviours across different cultures.^[11,12]

The World Health Organization (WHO) estimates that 52% of pregnant women in developing countries are anemic compared with 23% in the developed world.^[13]

World Health Organization (WHO) has defined anaemia in pregnancy as the haemoglobin (Hb) concentration of less than 11 g/dl^[14]. According to WHO, anaemia is considered to be of a public health significance or problem if population studies find the anaemia prevalence of 5.0% or higher. Prevalence of anaemia of $\geq 40\%$ in a population is classified as a severe public health problem^[15].

In our study, pregnant women age 20 to 25 years were commonly suffered with anaemia 65 (54.16%). All the cases were belonged from rural area of Katihar.

Grace stephen, et al. (2018)^[16] were studied on anaemia in pregnancy. They were include 529 participants ranged from 15 to 46 years with mean age of 25.8 (SD 5.73) years.

In this present study, we were enrolled 120 anaemic pregnant women age ranged <20 years to > 30 years. Mild anemia was present in 68 (56.66%) of pregnant women. Moderate anaemia was present in 27(22.5%). And 25(20.83%) was non-anaemic. And there was no any cases of severe anaemia.

Kwabena Acheampong, et al. (2018)^[17] were found that in terms of gravity, mild anemia was 60.8%, moderate anemia was 39.2% and severe anemia was 0.0%. This study was supported the findings of our study.

In this present study, majority of cases 47(39.16%) were parity greater than 3. Interval between pregnancy in majority of cases 47(39.16%) was 2-3.

Similar result was reported on association of anaemia with parity.^[18] Several studies have observed higher prevalence of anaemia in women with high parity.^[18,19] Likely rationalization to the high prevalence of anemia among multiparous women is that these women might have gotten pregnant with low levels of nutrients due to the reduction of reserves of the mother in prior pregnancies and lactation periods or possibly did not also allow spaces between their pregnancies so were not fully recovered from previous anemia.^[17]

In this present study, majority of anaemic cases were not consumption IFA tablets, which was accounted 62(65.26%). And literacy was very low in anaemic pregnant women. Illiterate was seen in 65(55%) pregnant women. Most of the anaemic cases were lived in joint family, which was accounted 82(68.33%).

Mishu Mangla, et al. (2016)^[20] stated that iron Folic acid prophylaxis also were very significant variables in the determination of prevalence as well as the severity of anemia. In their study, majority of cases of Severe and very severe anemia were found in those pregnant females who had either not taken IFA prophylaxis or had taken it irregularly (100%) and had underwent only 1 or 2 ANC visits (89.3%).

Ravishankar Suryanarayana, et al. (2015)^[21] were studied on 446 pregnant women. They were found that 16.4% of women belonged to first, 42.2% to second, and 41.5% to third trimesters. Most of the women belonged to below poverty line (BPL) families (94.8%). Regarding education, 36.3% were illiterates and 40% had completed matriculation or PUC. More than half (57%) of the study subjects belonged to joint families and 34% to nuclear families. Regarding gravidity, 37.5% pregnancies were of primigravida, 48% second gravida, and 14% multigravida.

In this present study, we were found that majorities of anaemic pregnant women were belonged in lower 56(46.67%) and middle 51(42.5%) socioeconomical classes.

According to Ravishankar Suryanarayana, et al. (2015)^[21] Anemia was predominantly seen among

pregnant women belonging to BPL families (59.4%) compared with APL families (5.4%). Similar observation was made in a study conducted by Lokare et al.^[22] in Aurangabad city, the proportion of pregnant women experiencing anemia in classes I and II were less (47.61% and 71.42%, respectively) when compared with the lower socioeconomic status (93.51%, 94.49%, and 94.11% in classes III, IV, and V respectively). Khan et al.^[23] in Uttar Pradesh made similar observation endorsing that anemia in pregnancy was inversely proportional to the socioeconomic class. Improvement in health-care delivery system with health education targeting improved utilization of availability of healthcare facilities at the beneficiary door steps will help in reducing anemia prevalence.^[21]

Conclusion

This present study was concluded that anaemia in pregnancy was commonly seen in age 20 to 30 years. Most of the pregnant women had mild anaemia. Parity > 3, pregnancy interval 2-3, illiteracy, lower socioeconomic status was major predictors of anaemia in pregnancy.

Hence, anemia continues to be a major public health problem in rural area. Age group, parity, interval between pregnancies, illiteracy and socioeconomic status are the major factors that contribute to the problem of anemia. To reduce the prevalence, there is a need to public health education on reproductive health, improve the dietary level and strength health care seeking behavior of women. Strategic efforts are needed to broaden the coverage of iron and folic acid distribution and its consumption.

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