ESTD 1906
An Official Journal of AIGPA

INDIAN MEDICAL JOURNAL

NIC / BID / ICMR / JR / 233 dt. 14.12.2012, INDEX MEDICUS by NIC, New Delhi, Govt. of India

The Official Monthly Scientific Journal of

All India General Practitioners' Association

(IMJ) 111th Yr. Publication

27, Dixon Lane, Kolkata 700014, Phone : +91-033-22270102

Ref. No. 2081 b)

Date 03/08/16

To,
DR. Arjun Kumar Singh, Assistant Professor, Dept. of Ophthalmology, KMCH, Katihar, Bihar.
DR. Abhinav Kumar, PG Student, Dept. of Dermatology, Lady Harding Medical College, New Delhi.

SUB: "Surgical complications during cataract operation in patients with Pseudoexfoliation syndrome."

Respected Sir/Madam,

We would like to inform you that the above mentioned article has been accepted suitable for publication in IMJ (NIC/BID/ICMR/JR/ 233 Dt. 14.12.12, INDEX MEDICUS by NIC, NEW DELHI, GOVT. OF INDIA).
Please bear with us as we have space constraint to publish the said article.
We will try to accommodate as soon as possible when space provided.
Thanking You.
Yours Sincerely,

Prof. (DR.) Niladri Sarkar
Editor in Chief
Indian Medical Journal

Surgical Complications during Cataract Operation in Patients with Pseudoexfoliation Syndrome

Arjun Kumar Singh[1], Abhinav Kumar[2]

ABSTRACT - Pseudoexfoliation is a common and clinically important systemic condition that affects elderly people, who are also likely to undergo cataract surgery. The purpose of this study was to study the frequency and types of complications of small incision cataract surgery (SICS) and phacoemulsification surgery in patients with cataract and PXE. Material and Methods – Cross sectional descriptive study was carried out on 50 eyes with cataract and PXE. Who underwent SICS or phacoemulsification surgery. Their perioperative and postoperative complications were documented and analyzed. Results – Poor pupilary dilatation in spite of use of standard mydriatic drops and nonsteroidal anti-inflammatory drugs was the most common finding. This single factor made subsequent steps of surgery very difficult due to poor peripheral visualization. Pupillotomy was done in 25% cases. Other problems encountered were accidental irido dialysis, posterior capsule rupture, vitreous loss, retained cortical matter, decentered intraocular lens and zonular dialysis. Conclusion Presence of associated PXE in cataract patients significantly increased the risk of vision threatening complications. Use of flexible iris hooks for small pupils and for capsular stability, capsular tension rings and high viscocity viscoelastics are useful modifications of surgical technique for good visual outcome.

Key words: Pseudoexfolation, Zonular Weakness, Pupillotomy, Phacoemulsification.

---

1. Dr. Arjun Kumar Singh, Assistant Professor, Department of Ophthalmology, Katihar Medical College, Katihar,
E-mail: drarjun53@gmail.com, Mob.: 918936040590.

2. Dr. Abhinav Kumar, P.G. Student, Department of Dermatology, Lady Harding Medical College, New Delhi,
E-mail: abhinavmanic@gmail.com, Mob.: 0925061872.

INTRODUCTION PXE is recognized as an accumulation of grey white fibrogranular extracellular pseudoexfoliative material produced by abnormal basement membranes of ageing epithelial cells in trabeculum, equatorial lens capsule, papillary margin of iris and ciliary body of the eye. Exfoliative fibrillopathy has been reported in the skin and visceral organs as well, thereby suggesting that it is an ocular manifestation of systemic disorder.

PXE usually presents in the elderly age group who are likely to undergo cataract surgery. The clinical changes are most readily apparent on the lens capsule. Preoperative diagnosis can be made by examining the papillary margin for deposits of grey dandruff like flakes along with a moth eaten appearance of iris sphincter on transillumination. On dilating the pupil, the characterstic double ring appearance can be seen with a central disc and peripheral band of PXE and clear area in between. It may be associated with secondary open angle glaucoma.

Cataract surgery is a challenging task due to surgical and postoperative difficulties in these cases.

MATERIAL AND METHODS The study was carried out over 50 eyes. Patients admitted one day prior to surgery and detailed history was taken. Visual acuity was measured using Snellen's chart. Intraocular pressure was measured by applanation tonometer. Gomioscopy was done and the angle was graded. Detailed slit lamp examination was done and pseudoexfoliative deposits were looked for. All patients were operated using small incision cataract surgery or phacoemulsification. All patients were put on topical antibiotic drop one day prior to surgery. Patients were dilated with mydriatic cycloplegic drops and non steroidal anti-inflammatory drops were used to maintain the dilatation. Pupillary diameter after dilation was measured and graded as poor, moderate and good.

Peribulbar block was done. Povidone iodine was instilled into conjunctival sac. Conjunctival flap was made, sclera incision given and sclerocorneal tunnel was constructed with crescents. Gentle thorough hydrodissection was performed to separate cortex from nucleus. Nucleus was delivered. Irrigation and aspiration was

done. Rigid single piece biconvex posterior chamber intraocular lens was implanted.

In patients who were operated by phacoemulsification, clear corneal incision was made and nucleus was emulsified by stop and chop technique. Post operatively patients were put on topical antibiotics and steroids tapered over 4-6 weeks depending upon the post operative inflammation. Patients were followed on day 1. 7. 14 and at weekly intervals for 3 months.

RESULTS – Fifty eyes with PXE who underwent cataract surgery by SICS or phacoemulsification technique were included in this study to evaluate the perioperative and postoperative complication.

All patients underwent cataract surgery using SICS technique or clear corneal phacoemulsification. Surgical complications are listed in table-1.

Surgical Complications during cataract surgery (n = 50)

Surgical Complications	No. of eyes (n = 50)	Percentage
Poorly dilated pupil	30	60%
Iridodialysis	01	2%
Lens dislocation	00	0%
Posterior capsule rupture	04	8%
Vitreous loss	04	8%
Retained lens matter	06	12%
Decentered IOL	03	6%
Zonular dialysis	01	2%
Postoperative hyphema	01	2%

DISCUSSION In present study fifty patients with PXE were evaluated. Most frequent problem encountered was a rigid pupil and none f the pupils dilated more than 7 mm in spite of use of standard mydriatic drops. Poorly dilating pupil. iridodialysis. lens dislocation. posterior capsule rupture. vitreous loss, retained

lens matter dencentered IOL. zonnular dialysis, postoperative hyphema was observed. This study demonstrated an increased incidence of intraoperative and postoperative complications. A thorough awareness of PXE syndrome and its effects on all ocular tissue is critical to understand the multifactorial causes of operative complication and thereby avoid or minimize them.

CONCLUSION PXE presents challenges that must be adequately addressed with proper pre-operative preparation, surgical care and post operative follow-up. Adequate pre operative assessment should aim to identify potential problems like the possibility of fragile zonules and difficult visualization due to small pupil. Appropriate post operative follow up is required to monitor and address IOP, capsular contracture and IOLs decentration issues. The main limitations of the study were the small sample size and duration of the study.

REFERENCES

1. Shastri I. Vasavada A. Phacoemulsification in Indian eyes with pseduexfoliation syndrome. J Cataract Refract Surg 2001:27:1629-37.

2. Scorolli I. Scorolli L, Campos EC, Bassein L, Meduri RA. Pseudoexfoliation syndrome: A cohort study on intraoperative complication sin cataract surgery. Ophthalmologica 1998;212:278-80.

3. Avramides S. Traianidis P, Sakkias G. Cataract surgy and lens implantation in eyes with exfoliation syndrome. J Cataract Refract Surg 1997;23-583-7.

4. Droslum L. Haaskjold E, Sandvig K. Phacoemulsification in eyes with pseudoexfoliaton. J Cataract Refract Surg 1998;24:787-92.

ESTD 1906
Official Journal of AIGPA

INDIAN MEDICAL JOURNAL

NIC / BID / ICMR / JR / 233 dt. 14.12.2012, INDEX MEDICUS by NIC, New Delhi, Govt. of India

The Official Monthly Scientific Journal of

All India General Practitioners' Association

27, Dixon Lane, Kolkata 700014, Phone : +91-033-22270102

(IMJ) 111th Yr. Publication

Reg. No. 2681(a)

Date : 03/08/16

To,
DR. Arjun Kumar Singh,
Assistant Professor, Dept. of Ophthalmology,
KMCH, Katihar, Bihar.

SUB: "Study of efficacy of small incision cataract surgery in hospital based eye camps in bihar."

Respected Sir/Madam,

We would like to inform you that the above mentioned article has been accepted suitable for publication in IMJ (NIC/BID/ICMR/JR/ 233 Dt. 14.12.12, INDEX MEDICUS by NIC, NEW DELHI, GOVT. OF INDIA).
Please bear with us as we have space constraint to publish the said article.
We will try to accommodate as soon as possible when space provided.
Thanking You.
Yours Sincerely,

Prof. (DR.) Niladri Sarkar
Editor in Chief
Indian Medical Journal

Study of Efficacy of Small Incision Cataract Surgery in Hospital based Eye Camps in Bihar

Arjun Kumar Singh

Abstract

Our study was to assess the post operative visual outcome after small incision cataract surgery in camp patients during the period of Jan 2014 to December 2015. Cataract surgery were carried out in patients after screening at community based screening camps. All senile cataract were included and complicated cataracts were excluded from the study. Patient underwent manual SICS with posterior chamber intraocular lens implant. Post operatively patients received oral antibiotics for 5 days and antibiotics and steroid drops for 6 weeks patients were followed up at regular intervals. Spectacle correction was given at the end of six weeks. Hundred patients were included in this study. At the end of 6th week best corrected visual acuity was 6/12 on snellen's chart or even better (6/9-6/6). Results showed good vision after SICS at low cost in camp patients. Average astigmatism was 2.5 D with no intraoperative complications justifying efficacy of hospitals based cataract camp surgery by SICS.

Key Words : SICS, visual outcome & astigmatism.

Introduction

Cataract stands out as the major cause of blindness with an estimated backlog of 16-20 million unoperated cases. The most effective treatment of cataract is the surgical removal of the clouded natural crystalline lens and its replacement with an artificial intraocular lens. Techniques of extra capsular cataract extraction have

Address for correspondence: Dr. Arjun Kumar Singh, Assistant Professor, Department of Ophthalmology, Katihar Medical College, Katihar.
E-mail: drarjun53@gmail.com, Mob.: 91-8936040590

improved tremendously in the past few decades. With small incision surgery now-a-days being the standard treatment. This may be carried out by cataract camps. Base hospital approach is an important alternative to peripheral eye camps which allows screening of patients in screening camps, their transfer to the base hospital and subsequently surgery in the base hospital. The present study was to report the outcome of cataract screening camps combined with base hospital surgery, in terms of visual outcome.

Material and Methods

This was an observational study considering total number of hundred patients. All senile cataract were included with visual acuity counting fingers 3 meter or less and with no other significant ocular or systemic illness. Complicated cataracts were excluded from the study. After complete ophthalmic evaluation like vision, intraocular pressure, sac patency, cataract density and fundus examination was done.

All patients underwent small incision cataract surgery with posterior chamber intraocular lens implantation under combined retrobulbar and peribulbar anesthesia under strict aseptic condition. If there was any difficulties in delivering the hard cataract the tunnel was extended. Subconjunctival dexamethasone and tobramycin injection was given. Post operatively all patients received oral antibiotics and analgesic for 5 days and topical antibiotic, steroid eye drop for six weeks in tapering dose. Subsequently all of them were followed up post operatively on day 1, day 6 and 6th week to check for best corrected visual acuity. Astigmatism was recorded on every visit using standard automated refractometer. Spectacle correction was given at the end of 6th week.

Results

All hundred patients underwent SICS with PCIOL implantation under local anesthesia. Age of patient ranged from 50 to 80 years. Among them 60 patients had senile mature cataract and 40 patients had senile immature cataract. Gender wise distribution of the patient showed 32 males and 68 females. Pre operative visual acuity in which 84 had vision counting fingers 3m or even less and 10 had hand movements and 6 had apperception of light only.

Post operatively uncorrected visual acuity was 6/12 (Snellen's Chart) or better by 6th week in 75% cases. BCUA of 6/12 and even better were achieved by 6th week in more than 85% cases and the remaining having low vision was mainly attributed to age related macular changes, myopic fundus, optic atrophy. Most common uncorrected visual acuity 6/12 or less was astigmatism in the majority of cases. Mean surgical astigmatism was 2.5 diopter (D) + 1 D.

Discussion

This study was done with the principle aim to find out the visual outcome after cataract surgery in base camps. Here patients were followed up on day 1, 1st week and BCVA 6/12 or better in our study was achieved in about 85% cases by the end of 6th week.

In our study post operative astigmatism was 2.5 D + 1 D with manual SICS with rigid polymethylmethacrylate intraocular lens (IOL) implantation and it was high compared with the average astigmatism was 0.7 D in the phaco and 0.88 D in the manual SICS. In other study where foldable IOLs were used.

Conclusion

Cataract is the principal cause of curable blindness in India. Screening camp followed by surgery in the base camp for SICS had good visual outcome in the majority of patients with the average astigmatism of 2.5 D. However in this study the sample size was small with a short term follow up.

References

1. Gogate PM. Small incision cataract surgery: Complications and mini-review. Indian J Ophthalmol 2009;57:45-9.

2. Kapoor H, Chatterjee A, Daniel R, Foster A. Evaluation of visual outcome of cataract surgery in an Indian eye camp. Br J Ophthalmol 1999;83:343-6.

3. Murthy G, Gupta SK, John N, Vashist P. Current status of cataract blindness and vision 2020: The right to sight initiative in India. Indian J Ophthalmol 2008;56:489-94.

ORIGINAL RESEARCH PAPER

Volume - 9 | Issue - 9 | September - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSOCIATION OF HBA1C LEVEL AND DIABETIC RETINOPATHY AMONG PATIENTS COMING TO OPD OF KATIHAR MEDICAL COLLEGE HOSPITAL AND ITS VISUAL OUTCOME: A RETROSPECTIVE CROSS SECTIONAL STUDY

Ophthalmology

Dr. Arjun Kumar Singh Associate Professor Department Of Ophthalmology Katihar Medical College, Katihar, Bihar.

Dr. Himanshu Kumar* Assistant Professor Department Of Ophthalmology Katihar Medical College, Katihar, Bihar. *Corresponding Author

KEYWORDS

Diabetic retinopathy (DR) is one of the major microvascular complications of diabetes.(5) It is one of the most common cause of preventable blindness in diabetic adults. A study of over 44,000 individuals from 9 countries,7 which evaluated fasting and 2-h postprandial plasma glucose and HbA1c levels found a curvilinear plot of diabetic retinopathy versus HbA1c, and suggested a threshold for the diagnosis of diabetes, based on several different statistical criteria, defined by the presence of diabetes-specific retinopathy in this large population as a function of HbA1c level. The statistical cutoff point for this diagnosis was determined to be an HbA1c threshold of >6.5%, which is the accepted international standard.

AIMS AND OBJECTIVE OF THE STUDY:

a) To find out the association between Diabetic Retinopathy (DR) and HbA1c.
b) To find out the possible stastical cut off for diagnosing diabetic retinopathy.

Background:

The associations between high glucose levels and diabetic retinopathy have been the basis for the diagnosis of diabetes. We aimed to provide updated data on the relationship between HbA1c and diabetic retinopathy, and to assess the diagnostic accuracy of the proposed HbA1c cutoff for detecting diabetic retinopathy.

MATERIAL AND METHOD:

This retrospective study was conducted in the Ophthalmology Department in Katihar Medical College & Hospital, Katihar, Bihar from 1 January 2018 to 31 December 2019. The study was conducted with the approval of the Institutional Ethics committee with proper consent taken from the patients.

Assessment of Retinopathy

Retinopathy signs were assessed by indirect ophthalmoscopy using 90 D lens and documented by takinf fundus photographs taken using a nonmydriatic digital retinal camera corresponding to Early Treatment for Diabetic Retinopathy Study (ETDRS) standard field 1 (centered on the optic disc) and ETDRS standard field 2 (centered on the fovea) obtained from each eye were graded.

Retinopathy was considered to be present if any characteristic lesion as defined by the ETDRS severity scale was present: microaneurysms, hemorrhages, cotton wool spots, intraretinal microvascular abnormalities, hard exudates, venous beading, and new vessels (9).

Measurement of HbA1c

Venous blood samples were collected by the technicins for the diabetic retinopathy diagnosedatients and were sent to laboratory for serum HbA1c assessment.

RESULT

1230 patients with diabetic retinopathy were evaluated in this sstudy. The prevalence of diabetic retinopathy increased with increasing categories of HbA1c (P trend <.0001). The prevalence of moderate retinopathy started increasing above an HbA1c of 6.0. For example, the prevalence of moderate retinopathy between HbA1c levels 6 and 6.4 was 2% 6.7 , moderate or severer retinopathy was 6.8. This study confirmed that HbA1c threshold of 6.5 % allowed the proper detection of diabetic retinopathy. Our data support the judicious use of HbA1c for the diagnosis of diabetes and detecting diabetic retinopathy as well

CONCLUSION

Our study supports the use of HbA1c for diagnosing diabetes in the populatin of patients attending our OPD. The relationship of HbA1c and retinopathy, a cut-point of 6.5% performs reasonably well in all the patients.(12)

DISCUSSION

The current study, involved 1230 attending our eye OPD with diabetic retinopathy showed some relationship of HbA1c and retinopathy. The prevalence of moderate retinopathy below HbA1c 6.5% was <1% in all three ethnic groups, and HbA1c of 6.5–7.0% was associated with a higher prevalence of moderate retinopathy as compared to those with HbA1c <6.5%. Our data provide important evidence that the HbA1c is a suitable test for the diagnosis of diabetes.

Its worth mentioning that different levels of exposure to hyperglycemia, and thus different levels of risk for microvascular complications is there in different individuals.

However, retinopathy does not occur overnight when HbA1c reaches 6.5%. In type 1 diabetes, retinopathy takes much longer to develop when the HbA1c levels are usually much higher than 6.5%. Therefore, it is likely that diabetic eye disease starts earlier and at a lower HbA1c in many subjects and that the cut-point of 6.5%, from this perspective, is likely to be very conservative.

It is worth noting that adopting the recommendation to diagnose diabetes in those with HbA1c ≥6.5% will result in an increase in the prevalence of diabetes mellitus as compared to the existing diagnostic criterion of FPG ≥7.0 mmol/L. This may have implications for the healthcare system because it will increase the resources to manage these patients. In resource-constrained health systems like ours, a slightly higher HbA1c cut-point in the range of 6.7–6.8% could be adopted to maintain the level of sensitivity and specificity without an increase in the prevalence of diabetes.

REFERENCES:

1. Higgins T.HbA1c for screening and diagnosis of diabetes mellitus Endocrine.2013;43(2):266–273.
2. Colagiuri S, Lee CM,WongTY,Balkau B, Shaw JE, Borch-Johnsen K. Glycemic thresholds for diabetes-specific retinopathy: implications for diagnostic criteria for diabetes. Diabetes Care.2011;34(1):145–150
3. Herman WH, CohenRM.Hemoglobin A1c: teaching a new dog old tricks.Ann Intern Med.2010;152(12):815–817.
4. Bonora E,Tuomilehto J. The pros and cons of diagnosing diabetes with A1C. Diabetes Care.2011;34(suppl2):S184–S190.
5. Cohen RM, Haggerty S, Herman WH. HbA1c for the diagnosis of diabetes and prediabetes: is it time for a mid-course correction?J Clin Endocrinol Metab.2010;95(12):5203–5206.
6. American Diabetes Association. Standards of medical care in diabetes–2007. Diabetes Care.2007;30(suppl1):S4–S41.
7. World Health Organization. Definition and Diagnosis of Diabetes Mellitus and Intermediate Hyperglycaemia. Report of a WHO/IDF Consultation.Geneva, Switzerland:World Health Organization;2006.
8. American Diabetes Association. Standards of medical care in diabetes–2010.Diabetes Care.2010;33(Suppl1):S11–S61.
9. Sabanayagam C,Liew G,TaiES, et al. .Relationship between glycated haemoglobin and microvascular complications: is there a natural cut-off point for the diagnosis of diabetes?Diabetologia.2009;52(7):1279–1289.
10. Selvin E,NingY,Steffes MW, et al. .Glycated hemoglobin and the risk of kidney disease and retinopathy in adults with and without diabetes.Diabetes.2011;60(1):298–305.
11. Wong TY, Liew G,TappRJ, et al. .Relation between fasting glucose and retinopathy for diagnosis of diabetes: thaee population-based cross-sectional studies. Lancet.2008;371(9614):736–743.
12. Zoungas S,Chalmers J,Ninomiya T, et al. .Association of HbA1c levels with vascular complications and death in patients with type 2 diabetes: evidence of glycaemic thresholds.Diabetologia.2012;55(3):636–643.

ORIGINAL RESEARCH PAPER

Volume - 9 | Issue - 9 | September - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF DRY EYE DISEASE AND ITS RISK FACTORS IN VISUAL DISPLAY TERMINAL USERS AMONG PATIENTS COMING TO OPD OF KATIHAR MEDICAL COLLEGE HOSPITAL: A PROSPECTIVE OBSERVATIONAL STUDY.

Ophthalmology

Dr. Himanshu Kumar Assistant Professor Department Of Ophthalmology Katihar Medical College, Katihar, Bihar.

Dr. Arjun Kumar Singh* Associate Professor Department Of Ophthalmology Katihar Medical College, Katihar, Bihar.*Corresponding Author

KEYWORDS

INTRODUCTION:

Dry eye disease (DED) is a chronic ocular pathology and a major global health problem that manifests as a plethora of symptoms such as burning, photophobia, tearing, and grittiness. Patients with DED experience difficulties in daily routine activities thus compromising their quality of life.[1]

The prevalence of DED is greatly influenced by geographic location, climatic conditions, and lifestyle of the people and ranges from 5% to 35%.[6][7][8] However, different definitions of dry eye are employed in various epidemiological studies which may not be standardized, and limited data exist on the potential effect of race or ethnicity on dry eye prevalence.

MATERIAL & METHOD:

A cross-section hospital-based, observational study was conducted at an apex tertiary care ophthalmic institution. Patients presenting to the outdoor patient department over a period of 1 year (01 July 2019 30 June 2020) were evaluated. Ethical clearance was obtained from the institutional Ethical Committee. Informed consent was obtained from the patients.

All consenting patients above 10 years of age were included in the study and divided into four groups based on age: ≤20 years, 21–40 years, and >40 years. Patients younger than 10 years or not providing consent were excluded from the study.

The primary objective of the study was to analyze the prevalence of symptomatic DED based on the OSDI questionnaire and to analyze the associated risk factors. The secondary objective was to assess the tear film stability and secretion in patients with symptoms of DED.

Comprehensive history was obtained from all the patients with emphasis on history pertaining to dry eye. In addition, history of visual display terminals (VDT) usage including television, smartphones, tablets, laptops, etc., was also elicited and analyzed.

OSDI questionnaire was administered to all patients. The questionnaire was administered by a single examiner. To those who were nonconversant in English, the questions were explained to the patients in their local language. The OSDI questionnaire has 12 items, with each question given a score ranging from 0 (none of the time) to 4 (all of the time). The patients had to assign a score based on the duration of symptoms experienced over the preceding week. The final score was calculated by multiplying the sum of all the scores by 25 and then dividing the total by the number of questions answered. Scores range from 0 to 100 with 0–12 representing normal, 13–22 representing mild DED, 23–32 representing moderate DED, and ≥33 representing severe DED.[5][14]

The objective tests were undertaken only in patients with DED (based on the OSDI questionnaire) who gave consent for further investigations. These patients underwent tear film break up time (TBUT) and Schirmer test. The tests were carried out in the same room by a single examiner, with similar temperature and humidity conditions for all patients.

STATISTICALANALYSIS:

The data were analyzed using Stata 14.0 (StataCorp LP, College Station, TX, USA). Chi-square test/Fischer Exact test were used to establish the association between categorical data. Bivariate logistic regression analysis was used to calculate the odds ratio (OR). Multivariate analysis was performed to identify independent risk factors. $P < 0.05$ was considered statistically significant.

RESULT:

A total of 1264 patients were administered the OSDI questionnaire. Their demographic profile is elaborated in significant DED was detected in 18.04% (228) patients. Of these, 11.84% (27) had mild DED, 62.28% (142) had moderate DED, and 25.76% (59) had severe DED. The mean OSDI scores were 20.59 ± 1.14 in cases with mild DED, 28.60 ± 2.68 in cases with moderate DED and 42.32 ± 7.82 in cases with severe DED. The prevalence of DED was more in males (69.3% males, 30.7% females) and in patients between 23 and 44 years of age (68.1%). Majority of patients belonged to the urban areas (60.02%) as compared to a rural background (39.98%). Patients involved in desk jobs with computer use were more predisposed to develop DED.

A bivariate analysis of the risk factors associated with the development of severe DED as well as a multivariate analysis of risk factors associated with DED was undertaken. Significant odds of having severe DED were associated with age, occupation, VDT use, cigarette smoking, and contact lens use.

There was no significant difference in the severity of the disease between males and females ($P = 0.16$). Occupation involving desk job with regular computer usage was associated with the development of dry eye, with 79.47% of computer users having severe DED. Hours of video display terminal (including computers, television, and mobile phone screens) usage significantly correlated with DED ($P < 0.001$), and 87.76 % patients with 4 h or more of VDT use had severe dry eye.

Cigarette smoking ($P < 0.001$, OR 1.5; 92% CI 1.12–1.14) and contact lens usage ($P < 0.001$, OR 6.4; 95% CI 3.29–11.58) were identified as significant risk factors for severe DED.

There was no significant association between severe DED and the presence of systemic disease, systemic or ocular allergy, previous ocular surgery, alcohol intake or any systemic, or topical medications including steroid use

Objective tests were undertaken in 382 patients (764 eyes) with DED. Of these, 19.89% (76) had nonsevere DED (mild and moderate), and the remaining 80.1% (306) had severe DED. The mean Schirmer's test values were 23.0 ± 7.1 mm in cases with mild DED, 19.1 ± 5.9 mm in cases with moderate DED, and 15.2 ± 6.9 mm in cases with severe DED. The mean TBUT was 11.1 ± 1.4 s in cases with mild DED, 7.3 ± 1.8 s in cases with moderate DED and 5.2 ± 1.9 s in cases with severe DED. A Schirmer's test value of <5.3 mm (indicative of severe DED) was observed in only 4.9% cases . TBUT of <10 s (indicative of tear film instability) was observed in 95.8% cases.

DISCUSSION

DED is one of the most prevalent ophthalmic disorders and may have an adverse impact on the quality of life. In addition to causing various disabling symptoms, it may also compromise the results of the corneal, cataract, and refractive surgical procedures.

Several objective tests have been developed to diagnose and grade the severity of DED. However, these tests show poor repeatability, significant interobserver variability and correlate poorly with the patient symptoms as well as the quality of life.[2][3][4] Different patient-reported outcome (PRO) questionnaires have been developed to assess the quality of life in patients with DED, which act as a useful tool to aid in the screening, monitoring, and management of DED.[5][17] Two validated, reliable dry eye questionnaires are currently available that are in accordance with the FDA PRO guidelines: OSDI and the impact of dry eye on everyday life questionnaire.[5][17][18][19][20] In our study, we used the OSDI questionnaire as the basic tool for screening the patients. Its shorter completion time, easy comprehension by patients, and no additional cost make it ideal for clinical use in the outpatient department.[5][20]

The prevalence of dry eye in our study based on OSDI questionnaire is 18.04%. The prevalence of DED in India is higher than the global prevalence and ranges from 18.4% to 54.3%.[9][13] The vast disparity in the prevalence of DED may be attributed to endemic geographic variations as well as the use of different diagnostic criteria by various studies.

In our study, the majority of patients with DED were in the age group of 21–40 years.

Females are affected more commonly than males in a majority of studies.[6][7][8][9][10][11][12][13] We observed a significantly higher occurrence of DED in males. Since ours was a hospital-based study, this trend could be attributed to the lack of treatment-seeking behavior among females in the developing countries.

Desk job with computer use was significantly associated with the risk of developing severe DED. The low-relative humidity in indoor office environment and air-conditioned rooms negatively impacts the tear film by causing desiccation of the eye. We observed a strong association between VDT usage and severe DED. Computer use for more than 8 h a day has been reported as a significant risk factor for DED, mainly attributed to the decrease in blink rate while using these devices, thereby hampering the uniform distribution of the tear film over the ocular surface.[22] Since the main route of tear elimination is through evaporation, longer periods of eye opening and the higher gaze angle when viewing a computer screen results in faster tear loss which further worsens the dry eye.

We observed a significant association of DED with contact lens usage as well as smoking. Contact lens usage may cause dry eye or aggravate preexisting DED.[23][24] Nearly 50% of contact lens users may complain of symptoms of dryness, discomfort, grittiness, irritation, burning, or foreign body sensation.[23][24] Smoking may affect the tear film stability as well as ocular surface sensitivity, and a significant association has been reported between smoking and DED.[25]

We did not observe any association with systemic comorbidities, allergies, previous ocular surgery, alcohol or medication use, either systemic or topical.

The inherent bias associated with hospital-based studies is a limitation of our study. Rural population staying in far-flung areas with limited access to healthcare, females and elderly are less likely to visit the hospital due to sociocultural environment prevalent in developing nations. Moreover, the patients had come for specific reasons mostly not pertaining to DED, and these patients were usually not willing to undergo further examination.

CONCLUSION

We observed the prevalence of DED among the patients coming to our OPD to be 18.04%, with the age group of 23–44 years affected most commonly. VDT use, smoking, and contact lens use were associated with increased odds of developing DED.

REFERENCES

1. Miljanović B, Dana R, Sullivan DA, Schaumberg DA. Impact of dry eye syndrome on vision-related quality of life. Am J Ophthalmol 2007;143:409-15.
2. Nichols KK, Mitchell GL, Zadnik K. The repeatability of clinical measurements of dry eye. Cornea 2004;23:272-85.
3. Begley CG, Chalmers RL, Abetz L, Venkataraman K, Mertzanis P, Caffery BA, et al. The relationship between habitual patient-reported symptoms and clinical signs among patients with dry eye of varying severity. Invest Ophthalmol Vis Sci 2003;44:4753-61.
4. Kallarackal GU, Ansari EA, Amos N, Martin JC, Lane C, Camilleri JP, et al. A comparative study to assess the clinical use of fluorescein meniscus time (FMT) with tear break up time (TBUT) and Schirmer's tests (ST) in the diagnosis of dry eyes. Eye (Lond) 2002;16:594-600.
5. Schiffman RM, Christianson MD, Jacobsen G, Hirsch JD, Reis BL. Reliability and validity of the ocular surface disease index. Arch Ophthalmol 2000;118:615-21.
6. The epidemiology of dry eye disease: Report of the Epidemiology Subcommittee of the International Dry Eye Workshop (2007). Ocul Surf 2007;5:93-107.
7. McCarty CA, Bansal AK, Livingston PM, Stanislavsky YL, Taylor HR. The epidemiology of dry eye in Melbourne, Australia. Ophthalmology 1998;105:1114-9.
8. Lin PY, Tsai SY, Cheng CY, Liu JH, Chou P, Hsu WM, et al. Prevalence of dry eye among an elderly Chinese population in Taiwan: The Shihpai eye study. Ophthalmology 2003;110:1096-101.
9. Gupta N, Prasad I, Jain R, D'Souza P. Estimating the prevalence of dry eye among Indian patients attending a tertiary ophthalmology clinic. Ann Trop Med Parasitol 2010;104:247-55.
10. Basak SK, Pal PP, Basak S, Bandyopadhyay A, Choudhury S, Sar S, et al. Prevalence of dry eye diseases in hospital-based population in West Bengal, Eastern India. J Indian Med Assoc 2012;110:789-94.
11. Rege A, Kulkarni V, Puthran N, Khandgave T. A clinical study of subtype-based prevalence of dry eye. J Clin Diagn Res 2013;7:2207-10.
12. Sahai A, Malik P. Dry eye: Prevalence and attributable risk factors in a hospital-based population. Indian J Ophthalmol 2005;53:87-91.
13. Shah S, Jani H. Prevalence and associated factors of dry eye: Our experience in patients above 40 years of age at a tertiary care center. Oman J Ophthalmol 2015;8:151-6.
14. Walt JG, Rowe MM, Stern KL. Evaluating the functional impact of dry eye: The ocular surface disease index. Drug Inf J 1997;31:1436.
15. Lemp MA, Hamill JR Jr. Factors affecting tear film breakup in normal eyes. Arch Ophthalmol 1973;89:103-5.
16. van Bijsterveld OP. Diagnostic tests in the Sicca syndrome. Arch Ophthalmol 1969;82:10-4.
17. Guillemin I, Begley C, Chalmers R, Baudouin C, Arnould B. Appraisal of patient-reported outcome instruments available for randomized clinical trials in dry eye: Revisiting the standards. Ocul Surf 2012;10:84-99.
18. Abetz L, Rajagopalan K, Mertzanis P, Begley C, Barnes R, Chalmers R, et al. Development and validation of the impact of dry eye on everyday life (IDEEL) questionnaire, a patient-reported outcomes (PRO) measure for the assessment of the burden of dry eye on patients. Health Qual Life Outcomes 2011;9:111.
19. U.S. Department of Health and Human Services FDA Center for Drug Evaluation and Research, U.S. Department of Health and Human Services FDA Center for Biologics Evaluation and Research, U.S. Department of Health and Human Services FDA Center for Devices and Radiological Health. Guidance for industry: Patient-reported outcome measures: Use in medical product development to support labeling claims: Draft guidance. Health Qual Life Outcomes 2006;4:79.
20. Grubbs JR Jr., Tolleson-Rinehart S, Huynh K, Davis RM. A review of quality of life measures in dry eye questionnaires. Cornea 2014;33:215-8.
21. Muñoz B, West SK, Rubin GS, Schein OD, Quigley HA, Bressler SB, et al. Causes of blindness and visual impairment in a population of older Americans: The Salisbury Eye Evaluation Study. Arch Ophthalmol 2000;118:819-25.
22. Uchino M, Yokoi N, Uchino Y, Dogru M, Kawashima M, Komuro A, et al. Prevalence of dry eye disease and its risk factors in visual display terminal users: The Osaka study. Am J Ophthalmol 2013;156:759-66.
23. Begley CG, Caffery B, Nichols KK, Chalmers R. Responses of contact lens wearers to a dry eye survey. Optom Vis Sci 2000;77:40-6.
24. Doughty MJ, Fonn D, Richter D, Simpson T, Caffery B, Gordon K, et al. A patient questionnaire approach to estimating the prevalence of dry eye symptoms in patients presenting to optometric practices across Canada. Optom Vis Sci 1997;74:624-31.
25. Xu L, Zhang W, Zhu XY, Suo T, Fan XQ, Fu Y, et al. Smoking and the risk of dry eye: A meta-analysis. Int J Ophthalmol 2016;9:1480-6.

DOI: 10.21276/aimdr.2016.2.3.25

Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Paèdiatric Ocular Trauma: A Population Based Study on Ocular Morbidity in Children and Prevention of Monocular Blindness in Cases Attending a Tertiary Care Teaching Hospital.

Atul Mishra[1], Jawaid Hasan[2]

[1]Professor & Head, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar, India.

[2]Associate Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India

ABSTRACT

Background: Ocular trauma especially in children is an unpleasant occurrence. A protocol for timely presenting the patient before the nearest available physician or ophthalmologist and rapid evaluation of severity along with indispensible clinical management must be followed at all levels of healthcare. The aim of the study is to evaluate the causes and management of blunt ocular trauma in children and prevention of monocular blindness in a rural area in Bihar. Design of the study – A tertiary centre based retrospective and observational study. **Methods:** Children up to the age of fifteen years who presented with ocular trauma between September 2014 and February 2016 to the outdoor clinic of Department of Ophthalmology or any of the primary health centres of Katihar Medical College were undertaken for this study. **Results:** A total number of 212 children presented with ocular trauma. The minimum age at presentation was 1 year while the maximum was at 14 years and 9 months. Out of 212 cases, 159 (75%) were males and 53 (25%) were females. Blunt mode of ocular trauma was observed in 180 (85%) cases and was more common than penetrating mode of ocular trauma which was observed in 32 (15%) cases. Among the cases with blunt trauma, 132 (63%) received conservative treatment with weekly follow up for visual acuity. The remaining 80 (27%) underwent surgery. Post trauma the two most common complaints of visual impairment were compression of the globe in 30 (14%) cases followed by of corneal opacity in 19 (9%) cases. **Conclusion:** Ocular trauma in general particularly in children of is alarming. Majority of presenting cases are boys. There is a need for creating awareness among family members and school teachers. Emphasis must be laid on seeking quality treatment within shortest possible time. improved health care facilities should be provided at the primary health care levels.

Keywords: Blunt, Ocular, Paediatric, Trauma, Visual.

INTRODUCTION

Blunt trauma forms a major part of ocular trauma. Balls and falls are the most common causes of blunt ocular trauma in the paediatric age group. It causes ocular damage by the mechanism of ocular compression. Concept of coup and countercoup injury similar to brain injury was used to explain the pathophysiology of blunt trauma to the eyeball.[1,2] Few examples of coup injuries in blunt trauma are corneal abrasions, subconjunctival haemorrhages, choroidal haemorrhages, and retinal necrosis and the best example of a countercoup injury is commotio retinae. Ocular trauma in children is a leading cause of visual morbidity. Ocular injuries accounts for approximately 8-14% of total injuries suffered by children.[3] Besides, direct damage to the ocular structures may result in loss of vision, poor visual outcome and amblyopia caused by prolonged period of light. Children are more prone to injuries because of their inability to avoid hazards.[4]

Name & Address of Corresponding Author
Dr Atul Mishra
Professor & Head,
Department of Ophthalmology,
Katihar Medical College,
Katihar, India.
E mail: original_article@lycos.com

The male child is in particular more vulnerable to have eye injuries as compared its female counterpart[4,5]. Etiologically such injuries are largely accidental. Infants and children, less than 3 years of age sustain fewer injuries due to close parental supervision. Older children injure themselves by spikes of toys, pencils, arrows, needles, thorns and stones. Sports related injuries are common in children from 5-15 years of age.[4,5] Injuries by animal tail and bird beak are common in rural areas[5]. Thermal non-penetrating injuries caused by fire crackers and toy pistols on religious events such as Diwali, Eid and Shab-e-Barat lead to loss of many eyes every year[6]. This study was conducted with the sole aim of documenting ocular trauma in children in a rural area.

MATERIALS AND METHODS

This retrospective observational study was conducted jointly by the Department of Ophthalmology and Department of Community Medicine of Katihar Medical College during September 2014 to February 2016 after obtaining permission from the Institutional Ethics Committee. All paediatric cases of ocular trauma less than 15 years of age who attended the primary health centres in rural areas under the Department of Community Medicine of Katihar Medical College and the

outdoor clinic of Department of Ophthalmology of Katihar Medical College, directly or through referral, were included. A detailed history of each case was recorded followed by physical examination. Visual acuity was measured at the time of presentation. Pre-school and school going children were examined using appropriate methods and different methods were used to assess the visual acuity of literate and illiterate children. Ocular examination was performed using with slit lamp, hand held slit lamp and direct ophthalmoscope and fundoscopy was performed using an indirect ophthalmoscope. Cases with insignificant ocular damage or with minor subconjunctival haemorrhage were discharged and advised for follow up. Foreign bodies lodged superficially were removed under local anaesthesia. Cases diagnosed with corneal abrasions or lacerations were prescribed antibiotic or antifungal eye drops. Ointments and cycloplegics were also prescribed depending on the severity of trauma. Cases with uveitis were treated with either with topical or systemic corticosteroids. Cases of hyphaema were treated with conservative approach such as bed rest and topical medication. Cases presenting with penetrating ocular injuries required surgeries. The same was performed in the O.T. under G.A. using operating microscope. Globe repair was done as early as possible in cases of globe damage or damage to several intraocular structures. Following these procedures, cases discharged were advised weekly follow up for visual acuity and final visual acuity was recorded after 6 months. Cases with prior management of long standing trauma were excluded from this study. Statistical analysis of data was performed.

RESULTS

Two hundred and twelve children attended the primary health centres of Katihar Medical College and the outdoor clinic of Ophthalmology of Katihar Medical College from September 2014 to February 2016. The minimum and maximum presenting ages were 1 year and 14 years and 9 months respectively [Table 1]. Out of these 212 students, 159 and 53 were males and females respectively. In male children the right eye and left eye were involved in 93 (58%) and 66 (42%) cases respective. In female children the right eye and left eye were involved in 37 (70%) and 16 (30%) cases respectively. Blunt mode of trauma was the most frequently observed mode of injury among children. It was seen in 180 (85%) cases. Other modes observed are described in tabular form. Most common finding seen in cases after ocular trauma was subconjunctival haemorrhage, which was seen in 39 (18%) cases followed by corneal lesions seen in 19 (9%) cases [Table 2]. Damage to multiple ocular structures was seen in 23 (11%) cases. Surgical intervention was required only in 80 (27%) cases. Compressed globe was the most common cause of decreased vision and was seen in 31 (14%) cases followed by corneal opacity in 11 (5%) cases [Table 2].

Table 1: Distribution of gender and age among presenting cases.

Gender	No. of patients	Minimum Age	Maximum Age
Male	159 (75%)	1 year	14 years 9 months
Female	53 (25%)	1 year 2 months	13 years 3 months

Table 2: Ophthalmic findings among presenting cases

Clinical signs on examination	Frequency among presenting cases
Conjunctival tear	5 (2.3%)
Corneal abrasion	27 (12.7%)
Corneal abscess	21(9.9%)
Corneal foreign body	4 (1.9%)
Corneal opacity	7 (3.3%)
Corneal tear	5 (2.3%)
Dislocated lens	6 (2.8%)
Ecchymosis	9 (4.2%)
Endophthalmitis	12 (5.7%)
Hyphaema	9 (4.2%)
Lid tear	16 (7.5%)
Multiple ocular structure damage	22 (10.4%)
Retinal detachment	5 (2.3%)
Retinal oedema	3 (1.4%)
Scleral tear	2 (0.94%)
Subconjunctival haemorrhage	39 (18.4%)
Subluxated lens	6 (2.8%)
Traumatic cataract	2 (0.94%)
Uveitis	11 (5.1%)
Vitreous haemorrhage	1 (0.47%)
Total	212

DISCUSSION

Children are more susceptible to ocular trauma because of their immature motor skills and curious nature.[7] Ocular trauma is the leading cause of acquired monocular blindness in young patients.[8] Our study focuses on the causes of eye injuries in children who presented to the primary health centres under the Department of Community Medicine or to the Department of Ophthalmology of our medical college. We also evaluated the severity and clinical management in these paediatric patients. Male children were observed to be more susceptible than their female counterparts.[8] Adult supervision has been found to play an important role in the prevention of paediatric ocular injuries. Children less than 3 years of age sustain fewer injuries because of close supervision by parents.[8] The male children are more affected as they tend to spend more time outdoors. We observed higher percentage of cases sustaining close globe injuries in our study. Ocular trauma among 126 children in Nepal and their visual outcome has been reported.[9,10] The injury caused by blunt object was seen in 180 (85%). In a study that looked at the medical records of 481 children of up to 16 years who had sustained ocular trauma, about

51% injuries were of open-globe type and 37.6% were closed-globe injuries.[10,11] Our study showed that vegetative material and wooden sticks were among the commonest causative agents. The injuries from plastic pellets and firecrackers on religious events accounted for significant number of ocular injuries and if early treatment is not provided, may lead to ocular damage either because of trauma but also due to late presentation because of government holidays on these events. The visual prognosis of eye injuries improves when prompt examination, diagnosis and treatment is provided. However socioeconomic, cultural and awareness factors may also play a role in receiving timely attention. A significant number of children of children in this study received medical attention during 24 hours after injury. Open-globe injuries generally result in poorer visual outcome compared to their close-globe counterparts.[11,12] Blunt trauma involving anterior segment has better visual outcome than when posterior segment is involved.[12] The non-perforating vegetative trauma can cause corneal erosions and ulcers, which can be complicated by polymicrobial infections leading to severe visual deterioration[13]. Therefore, proper antimicrobial treatment is required at an early stage. The traumatic hyphaema is usually managed conservatively. The glaucoma resulting from trauma may have early, intermediate and delayed presentation. The lens injuries can lead to traumatic cataract formation or subluxation of crystalline lens.[13,14] The perforating anterior segment trauma may cause corneal or scleral injury with varying degree of uveal tissue, lens and vitreous involvement. Unrepaired cases may carry a potential risk of endophthalmitis and panophthalmitis. The reported incidence of post-traumatic endophthalmitis is high compared to intraocular surgery.[14] The posterior segment involvement adversely affects visual outcome.[15] Manifestations such as commotio retinae, choroidal rupture, macular hole, retinal breaks and retinal detachment are critical for improvement of visual acuity. Patients with traumatic retinal detachments need to be operated as early as possible irrespective of the delay in presentation.

CONCLUSION

Ocular injuries in paediatric age group are to be taken seriously. Most can be prevented by promoting general awareness and first aid techniques among parents and schoolteachers. Child labour should be discouraged and children exposed to firecrackers during festivals must be properly supervised. Better health care facilities should be provided at both levels of primary and secondary health care centres for prevention of ocular morbidity. Health care workers should be trained for avoiding delay in seeking timely treatment for ocular trauma. This article is a community based study and is in the interest of public health and public safety.

Acknowledgements

The authors of this article acknowledge the support and co-operation received from the teaching faculty and non-teaching staff in the Department of Ophthalmology and Department of Community Medicine of Katihar Medical College.

REFERENCES

1. Bukhari S. Ocular trauma in children. Pak J Ophthal. 2011; 27(4):2008-2013
2. Katiyar V. Ocular trauma in Indian paediatric population. J Clin Ophthal Res. 2016; 4:19-23
3. Meredith TA. Post-traumatic endophthalmitis. Arch Ophthalmol. 1999; 117:520-521.
4. Babar TF. Pattern of paediatric ocular trauma in Hayatabad Medical Complex, Peshawar. Pak J Med Res. 2006; 45:6-9.
5. Takvam JA. Survey of eye injuries in Norwegian children. Acta Ophthalmol. 1993; 71:500-505.
6. Negral AD. The global impact of eye injuries. Ophthal Epidemiol. 1998; 5:143-169.
7. Adhikari NK. Ocular trauma among children in western Nepal: Agents of trauma and visual outcome. Nep J Ophthal. 2010; 2:164-165.
8. [8] Natarajan S. Ocular trauma, an evolving subspecialty. Ind J Ophthal 2013; 61:539-541.
9. Ubesie A. Paediatric ocular injuries in a resource deficient rural mission eye hospital in southern Nigeria. J Health Care Poor Underserved. 2014; 25:63-71.
10. Demissie BS, Demissie ES. Patterns of eye diseases in children visiting a tertiary teaching hospital in south western Ethiopia. Ethiop J Health Sc. 2014; 24:69-74.
11. Liu X, Liu Y, Liu z. Determination of visual prognosis in children with open globe injuries. Eye (London). 2014; 28:852-856.
12. Montanes CB. Eye injuries in childhood. Ann Esp Pediatr. 1998; 48:625-630.
13. Azab M. Childhood eye injuries in north Jordan. Int Ophthal. 1998; 22:269-273.
14. Krishnan M. Ocular injuries in union territory of Pondicherry. Ind J Ophthal. 1998; 36:82-85.
15. Arias JD. Epidemiology of childhood ocular trauma in northeast Colombian region. Arch Ophthal. 2003; 121:1439-1445.

How to cite this article: Mishra A, Hasan J. Paediatric Ocular Trauma: A Population Based Study on Ocular Morbidity in Children and Prevention of Monocular Blindness in Cases Attending a Tertiary Care Teaching Hospital. Ann. Inl. Med. Den. Res. 2016;2(3):99-101.

Source of Support: Nil, **Conflict of Interest:** None declared

DOI: 10.21276/aimdr.2016.2.3.29

Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Prevalence and Causes of Corneal Opacity in a Rural Population in Bihar: Need for Promotion of Health Awareness for Prevention of Corneal Blindness.

Atul Mishra[1], Jawaid Hasan[2]

[1]Professor & Head, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar, India.

[2]Associate Professor, Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India

ABSTRACT

Background: The cornea is the transparent frontal part of the eye that covers the iris, pupil and anterior chamber. Together with the lens, the cornea refracts light accounting for approximately two-thirds of the eye's total optical power. The cornea has unmyelinated nerve endings that are sensitive to touch, temperature and chemicals. The cornea is devoid of blood vessels as transparency is of prime importance. The cornea receives its nutrients by diffusion from the tear fluid at the outside and from the aqueous humor at the inside. In humans the cornea has a diameter of about 11.5 mm and a thickness of 500-600μm at the centre and 600-800μm at the periphery. Transparency, avascularity, presence of immature resident immune cells and immunologic privilege makes the cornea a very special tissue. Corneal opacity is a disorder of the cornea and it occurs when the cornea becomes scarred. This condition causes disruption of light waves passing through the cornea to the retina thus giving a cloudy or hazy appearance of the cornea. The aim of the study is to evaluate the prevalence and causes of corneal opacity in a rural area in Bihar. Design of the study – A population based retrospective and observational study. **Methods:** Among all the cases that presented with ocular morbidity between September 2014 and February 2016 to the outdoor clinic of Department of Ophthalmology or any of the primary health centres of Katihar Medical College, those with corneal opacity were enrolled for this study. Participants belonged to rural areas that were medically catered to by the primary health centres under the Department of Community Medicine of Katihar Medical College. Those participants who attended either the primary health centres or the outdoor clinic of the Department of Ophthalmology with corneal disease were included in this study. **Results:** During the study period a total of 519 cases presented with ocular morbidity and were diagnosed for corneal opacity. Prevalence of corneal opacity was 2.35% among the study population. Corneal opacity was reported to be much higher in the elderly probably due to a weakened immune system and among cases with poor personal hygiene. Common causes of corneal opacity in the study population was corneal degeneration, infective keratitis, ocular trauma and pterygium. **Conclusion:** Corneal morbidity in rural Bihar is attributed to keratitis, keratopathy, corneal degenerations, lack of hygiene and generalized immunodeficiency. Efforts must be made by health workers for health promotion and health awareness for promotion of corneal blindness.

Keywords: Blindness, Cornea, Morbidity, Opacity.

INTRODUCTION

The cornea is the transparent dome shaped surface that covers the front of the eye. Though the cornea is ultrathin and appears to lack substance, it is actually an organized group of cells and proteins. Unlike most tissues in the body, the cornea contains no blood vessels to nourish it or protect it against infection. The cornea is nourished by the tear fluid and aqueous humor and must remain transparent to refract light properly. The structure of the cornea is such that even the tiniest of blood vessels can interfere with the process of vision. Thus for optimum visual acuity the cornea must be free from any cloudy, hazy or opaque areas. The cornea copes extremely well with minor injuries or abrasions.

Name & Address of Corresponding Author
Dr Atul Mishra
Professor & Head,
Department of Ophthalmology,
Katihar Medical College,
Katihar, India.
E mail: original_article@lycos.com

In the event of a superficial injury, the healthy cells slide over and patch the injury before infection occurs or vision is affected. Deep injuries take a long time to heal and may result in unbearable pain, redness, visual impartment and extreme photosensitivity. They may also cause corneal scarring or opacity, visual loss and require corneal transplantation. Blindness causes physical, social and economic dependence of the blind person on the family and society.[1] According to WHO, an estimated 180 million people worldwide are visually disabled of whom nearly 45 million are blind and are living in developed countries.[2,3] Eighty percent of blindness is avoidable.[4] Corneal blindness is different from other types and causes of blindness because it is both preventable and curable to a large extent. Any local change in the index of refraction of the cornea leads to turbidity.[5] Corneal blindness due to corneal opacity is a common cause of ocular morbidity in developing countries. The term corneal opacity is used particularly for the loss of transparency of the cornea due to scarring. Treatment of corneal blindness once it has occurred is difficult and implementation of prevention measures perhaps remains the most cost-effective option. Corneal disease as a major cause of blindness is preceded only by cataract. Prevalence of corneal blindness varies from country to country and from population to population. The prevalence is

multifactorial. The common causes of corneal opacities such as trauma, keratitis, post-surgical, congenital, developmental, degenerative and dystrophic are avoidable.

MATERIALS AND METHODS

This retrospective observational study was conducted jointly by the Department of Ophthalmology and Department of Community Medicine of Katihar Medical College during September 2014 to February 2016. After obtaining permission from the Institutional Ethics Committee, 519 cases of corneal opacity were enlisted in this study after obtaining informed consent from each case. Cases with presenting complaint of diminished vision were included in this study. A detailed clinical history was recorded of each patient. Age, sex, occupation, socio-economic status, literacy and laterality of the affected eye were also recorded. Ocular investigation were performed in detail. Cases diagnosed with underlying systemic diseases and pterygium were excluded from this study. Visual Acuity (VA), anterior segment, posterior segment and intraocular pressure (IOP) were examined in detail following routine clinical procedures.

RESULTS

Out of the 519 cases of corneal opacity, we observed the following.

Table 1: Distribution of corneal opacity among presenting cases in this study

S. No.	Causes of Corneal Opacity	No. of cases	Percentage of cases
1	Trauma	232/519	44.7%
2	Infective	197/519	38.1%
3	Degenerative	58/519	11.2%
4	Congenital	32/519	06.1%

Table 2: Distribution of parameters among presentiog cases in this study

S. No.	Distribution	No. of cases	% of cases
1	According to age in years		
	• 00-25	141/519	27.2%
	• 26-50	195/519	37.6%
	• 51-75	183/519	35.2%
2	According to sex		
	• Male	325/519	62.6%
	• Female	194/519	37.4%
3	According to the eye involved		
	• Right eye	257/519	49.5%
	• Left eye	181/519	34.9%
	• Both eyes	81/519	15.6%
4	According to literacy		
	• Literate cases	217/519	41.9%
	• Illiterate cases	302/519	58.1%
5	According to complications		
	• Complicated	326/519	62.8%
	• Uncomplicated	193/519	37.2%

DISCUSSION

Blindness and visual impairment have far-reaching implications, as both are tragic situations in social and economic terms. Diseases affecting the cornea are a major cause of blindness worldwide, second only to cataract. The epidemiology of corneal blindness is complicated encircles a wide spectrum of infections and inflammatory diseases that may lead to functional blindness. Ocular trauma and corneal ulceration are significant causes of corneal blindness. Cause of childhood blindness include xerophthalmia, ophthalmia neonatorum and less frequently kerato-conjunctivitis. Corneal opacification from trachoma and corneal scars from trachoma and vitamin A deficiency were found to be 20% & 44% of all blindness in Ethiopia[6] and Tanzania[7] respectively. Corneal ulceration in developing countries has only recently been recognized as a silent epidemic.[8] The incidence of corneal ulceration was reported to be 113 per 100000 people in Madurai District of Tamil Nadu state in South India.[9] In our study we observed that trauma and infection were among the common causes of corneal opacity. Degenerative changes and corneal malformation were less significant [Table-1]. We also observed that in cases aged between 26-50 years the prevalence of corneal opacity was higher, with preponderance among males. The right eye was more vulnerable and corneal opacity was observed more among illiterates [Table-2]. A study on corneal blindness documented that the prevalence of corneal blindness was significantly higher in lower socio-economic strata of society and with increasing age.[10] Although the emphasis should be on prevention of corneal opacity, surgical treatment may be appropriate.[11] Optical iridectomy and pterygium excisions can be performed at regional health centres.[12] Meticulous post-operative care of the eye in addition of regular hospital follow up for at least a year are required for successful rehabilitation of keratoplasty, both of which are practically infeasible for majority of the rural cases in our study.

CONCLUSION

The epidemiology of corneal blindness is diverse and highly dependent on ocular diseases distributed geographically. Such diseases are directly responsible for occurrence of corneal opacity in populations. Both ocular trauma and corneal ulceration lead to corneal opacity thus causing monocular corneal blindness leading to visual impairment. There is vital need for mobilization of health workers to promote ocular health in rural areas. Irrespective of aetiology and cause, an eye blinded by corneal opacity hampers visual acuity permanently unless professional surgical treatment is

sought. Specific education aimed at earlier presentation of cases is required. This article is a community based study and is in the interest of public health and vision for all.

Acknowledgements
The authors of this article acknowledge the support and co-operation received from the teaching faculty and non-teaching staff in the Department of Ophthalmology and Department of Community Medicine of Katihar Medical College.

REFERENCES

1. Atti S. A clinical study of aetiology of corneal opacities. MRIMS J Health Sc. 2015: 3(1):39-41.
2. Park K. Epidemiology of chronic non-communicable diseases and conditions: Blindness. 21st Ed. India: Banarsidas Bhanot: 2011. pp 370-372.
3. Sihota R. The causes of and prevention of blindness. Parson's diseases of the eye. 20th Ed. India: Elsevier: 2007. pp 523-529.
4. Whitcher JP. Corneal blindness: a global perspective. Bulletin of the WHO. 2001; 79(3): 214-221.
5. Agrawal PK. The pathology of the cornea: a histopathological study. Ind J Ophth. 1983; 31:662-665.
6. Zerihun N. Blindness and low vision in Jimma Zone, Ethiopia: results of a population based survey. Ophthal Epidemiol. 1997; 4:19-26.
7. Rapoza P. Prevalence and causes of vision loss in Central Tanzania. Int Ophthal. 1991; 15:123-129.
8. Whitcher JP. Corneal ulceration in the developing world a silent epidemic. Br J Ophthal. 1997; 81:622-623.
9. Gonzales CA. Incidence of corneal ulceration in Madurai District, South India. Ophthal Epidemiol. 1996; 3:159-166.
10. Dandona R, Dandona L. Corneal blindness in a Southern India population: need for health promotion strategies. Br J Ophthal. 2003 Feb; 87(2):133-141.
11. Bowman RJC. Non-trachomatous corneal opacities in the Gambia: aetiology and visual burden. Eye. 2002;16:27-32.
12. Courtwright P. Changing patterns of corneal disease and associated vision loss at a rural African hospital following a training programme for traditional healers. Br J Ophthal. 1996; 80:694-697.

How to cite this article: Mishra A, Hasan J. Prevalence and Causes of Corneal Opacity in a Rural Population in Bihar: Need for Promotion of Health Awareness for Prevention of Corneal Blindness. Ann. Int. Med. Den. Res. 2016;2(3):115-7.

Source of Support: Nil. **Conflict of Interest:** None declared

http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v8i6.68

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Prevalence of various causes of infectious keratitis among patients coming to OPD of Katihar Medical College Hospital and its visual outcome: A prospective observational study

Authors
Dr Himanshu Kumar[1], Dr Arjun Kumar Singh[2*]
[1]Assistant Professor, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar
[2]Associate Professor, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar
*Corresponding Author
Dr Arjun Kumar Singh
A/39 PC Colony Opposite to Arun Jeitly Park Kankarbagh Patna 800020, Bihar, India

Introduction

Corneal infection is the most common cause of monocular corneal blindness worldwide.[1] The ocular trauma and corneal ulceration results in 1.5–2 million new cases of corneal blindness annually.[2] As per recent worldwide lists on the causes of blindness, corneal opacity is the second-most common cause of blindness and visual disability in developing countries.[3],[4] Corneal blindness due to keratitis is a major public health problem in India. The most common causes of corneal blindness are infections made worse by the lack of proper nutrition due to poverty and illiteracy. Ulcerative keratitis must be considered as an ocular emergency. Early recognition with prompt diagnosis and rapid institution of appropriate therapy will significantly improve visual prognosis.

This study was undertaken to evaluate current status, the incidence of infectious keratitis in this part of rural central India and its visual morbidity.

Materials and Methods

It was a prospective observational hospital-based study conducted at the Department of Ophthalmology, at a tertiary care hospital, in Katihar, Bihar India. The study was conducted with the approval of the Institutional Ethics committee with proper consent taken from the patients.

Inclusion criteria were patients with infectious keratitis, also patients on the treatment of infectious keratitis with irregular follow-up.

Exclusion criteria were patients showing signs and symptoms of endophthalmitis and panophthalmitis. Appropriate history was taken to find out predisposing factors, previous treatment, and duration of symptoms. Visual acuity was recorded at the time of presentation. All patients were evaluated on slit lamp to record the size, depth, and location of ulcer along with an examination of margins, floor, and infiltrations. Examination of ocular adnexa including lids, eyelashes, and lacrimal sac area was done. The sac syringing was done to check the patency of the lacrimal system, and random blood sugar was

recorded to screen for diabetes mellitus in every patient. Corneal scraping was done in cases of large epithelial defect and involved visual axis. A nonpreservative topical anesthetic was instilled (proxymetacaine 0.5%). Scrapping was taken with a disposable scalpel blade. Loose mucus and necrotic tissue were removed before scraping. The margins and base of the lesion were scraped. The thin smear was placed on one or two glass slide for microscopy, including gram stain, Giemsa, acid-fast bacillus, calcofluor white.[8]

Results

During the period of January 2019 to January 2020, a total of 68 were diagnosed with infective keratitis and were included in the study. The mean age of the patient was 46 years. Majority of patients of infectious keratitis were in between 41 and 60 (46%) age group followed by 21–40 (21%) and incidence in male was higher than (61%) that of female. The left eye was slightly more commonly involved (64%) as compared to the right eye (36%).

Distribution of patient according to occupation shows majority cases (42.04%) were farmer followed by household work (29.54%) and laborer (15.90%). Miserable amount patients among business (2.27%), students/children (6.81%) and 3.40% were others.

The incidence of fungal keratitis (47 cases, 69.11%) was higher than bacterial (15 cases, 22.05%) and viral (6 cases, 8.82%). Out of 68, fresh cases were 43 (63.23%), 8 (11.76%) patients were on antimicrobial and 17 on self medication on steroid (25%).

14.70% (10 cases) had significant vision-threatening complication noted at the time of presentation and during management. It includes secondary glaucoma occurred due to fibrinous exudates 10.29% (7 cases), iridiocyclitis 4.41% (3 cases) and While 58 cases (85.29%) had less significant vision-threatening such as corneal scar, mild iridocyclitis, and mild raised intraocular pressure (IOP) which was controlled on topical anti-glaucoma medication.

On prompt follow-up and appropriate treatment most of the corneal ulcer healed.41% had improved BCVA whereas 53% had stable BCVA compare to BCVA at the time of presentation. Only 6% deteriorated mainly due to poor follow-up and compliance.

Discussion

Clinical outcome in microbial keratitis and epidemiological patterns may be different from country to country and between different geographical regions within a country. In our study, Majority of patients of infectious keratitis were in between 41 and 60 (46%) age group followed by 21–40 (21%). Most of them were a farmer as this is the most common occupation of rural population in developing countries. This explains why agriculture trauma was the leading predisposing factor of corneal ulcer in developing countries.[9]

Incidence was higher in males (61%) than that of females in our study. Male predominance was found in many studies,[10],[15] . This may be because males are more involved in outdoor activities and also males are preferred over females to seek medical advice.

Out of the 68 patients with corneal ulcer, the detection of fungal filaments in10% KOH mount has 90%–99% sensitivity.[18] While sensitivity and specificity of bacterial detection in gram stain are inferior to that of culture method.[19] Fungal isolates (59.09%) were more common in this study than bacterial isolates (42.08%), followed by *Aspergillus* spp., was the most commonly isolated fungal pathogen in this study. Srinivasan *et al*.[10] show the similar to the findings, while other studies have reported *Aspergillus* spp.

Lack of awareness and local treatment from nonophthalmologist were responsible for late presentation and severe complications.

Majority of patients came to our hospital were from the nearby rural region. Most of them take initial treatment from the local practitioner including paramedical and medical personnel,

relatives, traditional healer, and even directly from drugstores. On prompt follow-up and appropriate treatment most of the corneal ulcer healed.

Conclusion

The incidence of fungal corneal ulcer is higher among various causes of infectious keratitis in the part of rural central India. Agricultural injuries are the main predisposing factor for infectious keratitis in this region. Prompt diagnosis and early appropriate treatment on the basis of laboratory investigation can helps the community to reduce the burden of corneal blindness. Community awareness of the risk factors and restriction of the abuse of topical corticosteroids or antibiotics plays a key role for control worsening of diseases.

References

1. Chirambo MC, Tielsch JM, West KP Jr., Katz J, Tizazu T, Schwab L, et al. Blindness and visual impairment in Southern Malawi. Bull World Health Organ 1986;64:567-72.
2. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Br J Ophthalmol 2012;96:614-8.
3. Whitcher JP, Srinivasan M, Upadhyay MP. Corneal blindness: A global perspective. Bull World Health Organ 2001;79:214-21.
4. Jonas JB, Xu L, Wang YX. The beijing eye study. Acta Ophthalmol 2009;87:247-61.
5. Population Census of India; 2011. Available from: http://www.//2011-common/censusData2011.html.
6. Kuper H, Polack S, Limburg H. Rapid assessment of avoidable blindness. Community Eye Health 2006;19:68-9.
7. NPCB. Managing Corneal Blindness. India: NPCB; April-June, 2012.
8. Sharma S, Kunimoto DY, Gopinathan U, Athmanathan S, Garg P, Rao GN, et al. Evaluation of corneal scraping smear examination methods in the diagnosis of bacterial and fungal keratitis: A survey of eight years of laboratory experience. Cornea 2002;21:643-7.
9. Panda A, Satpathy G, Nayak N, Kumar S, Kumar A. Demographic pattern, predisposing factors and management of ulcerative keratitis: Evaluation of one thousand unilateral cases at a tertiary care centre. Clin Exp Ophthalmol 2007;35:44-50.
10. Khare P, Shrivastava M, Kumar K. Study of epidemiological characters, predisposing factors and treatment outcome of corneal ulcer patients. Int J Med Res Rev 2014;2:33-9.
11. Srinivasan M, Gonzales CA, George C, Cevallos V, Mascarenhas JM, Asokan B, et al. Epidemiology and aetiological diagnosis of corneal ulceration in Madurai, South India. Br J Ophthalmol 1997;81: 965-71.
12. Reddy PS, Satyendran OM, Satapathy M, Kumar HV, Reddy PR. Mycotic keratitis. Indian J Ophthalmol 1972;20:101-8.
13. Bharathi MJ, Ramakrishnan R, Vasu S, Meenakshi, Palaniappan R. Aetiological diagnosis of microbial keratitis in South India – A study of 1618 cases. Indian J Med Microbiol 2002;20:19-24.
14. Bourcier T, Thomas F, Borderie V, Chaumeil C, Laroche L. Bacterial keratitis: Predisposing factors, clinical and microbiological review of 300 cases. Br J Ophthalmol 2003;87:834-8.
15. Gonzales CA, Srinivasan M, Whitcher JP, Smolin G. Incidence of corneal ulceration in Madurai district, South India. Ophthalmic Epidemiol 1996;3:159-66.
16. Bharathi MJ, Ramakrishnan R, Vasu S, Meenakshi R, Shivkumar C, Palaniappan R, et al. Epidemiology of bacterial keratitis in a referral centre in South India. Indian J Med Microbiol 2003;21:239-45.
17. Chander J, Singla N, Agnihotri N, Arya SK, Deep A. Keratomycosis in and around

Chandigarh: A five-year study from a North Indian tertiary care hospital. Indian J Pathol Microbiol 2008;51:304-6.

18. Vajpayee RB, Angra SK, Sandramouli S, Honavar SG, Chhabra VK. Laboratory diagnosis of keratomycosis: Comparative evaluation of direct microscopy and culture results. Ann Ophthalmol 1993;25:68-71.
19. Wahl JC, Katz HR, Abrams DA. Infectious keratitis in Baltimore. Ann Ophthalmol 1991;23:234-7.
20. Basak SK, Basak S, Mohanta A, Bhowmick A. Epidemiological and microbiological diagnosis of suppurative keratitis in gangetic West Bengal, Eastern India. Indian J Ophthalmol 2005;53:17-22.
21. Deorukhkar S, Katiyar R, Saini S. Epidemiological features and laboratory results of bacterial and fungal keratitis: A five-year study at a rural tertiary-care hospital in Western Maharashtra, India. Singapore Med J 2012;53:264-7.
22. Kumari N, Xess A, Shahi SK. A study of keratomycosis: Our experience. Indian J Pathol Microbiol 2002;45:299-302.
23. Kotigadde S, Ballal M, Jyothirlatha, Kumar A, Srinivasa R, Shivananda PG, et al. Mycotic keratitis: A study in coastal Karnataka. Indian J Ophthalmol 1992;40:31-3.

http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v8i6.70

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Association of dyslipidemia and Diabetic Retinopathy among patients coming to OPD of Katihar Medical College Hospital and its visual outcome: A prospective observational study

Authors
Dr Himanshu Kumar[1], Dr Arjun Kumar Singh[2*]
[1]Assistant Professor, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar
[2]Associate Professor, Department of Ophthalmology, Katihar Medical College, Katihar, Bihar
*Corresponding Author
Dr Arjun Kumar Singh
A/39 PC Colony Opposite to Arun Jeitly Park Kankarbagh Patna 800020, Bihar, India

Introduction

Diabetic retinopathy (DR) is one of the major microvascular complications of diabetes. It is one of the most common cause of preventable blindness in diabetic adults. Dyslipidemia, a major systemic disorder, is one of the most important risk factors for cardiovascular disease. Patients with diabetes have an increased risk of suffering from dyslipidemia concurrently.

Aims and Objective of the study

a) To find out the association between Diabetic Retinopathy (DR) and Lipid Profile.
b) To find out the possible mechanisms involving lipid metabolism and diabetic retinopathy.
c) To find out the effect of lipid-lowering therapies on diabetic retinopathy.

Background

For traditional lipid markers, evidence is available that total cholesterol and low-density lipoprotein cholesterol are associated with the presence of hard exudates in patients with DR. The study of nontraditional lipid markers is advancing only in recently years. The severity of DR is inversely associated with apolipoprotein A1 (ApoA1), whereas ApoB and the ApoB-to-ApoA1 ratio are positively associated with DR. The role of lipid-lowering medication is to work as adjunctive therapy for better control of diabetes-related complications including DR.

Material and Method

This retrospective study was conducted inthe Ophthalmology Department in Katihar Medical College & Hospital, Katihar, Bihar from1 January 2018 to 31 December 2019.The study was conducted with the approval of the Institutional Ethics committee with proper consent taken from the patients.

Inclusion Criteria

Patients with more than 5 years of diagnosed diabetes Type 2 were included.
Duration of diabetes ranged from 5 to 25 years.
Age group 20 to 80 years of age.

Exclusion Criteria

a) Patients with history less than 5 years of diagnosed diabetes.
b) Ocular surgery less than 6 months.
c) Those with accelerated hypertension.
d) Active ocular infection.
e) Co-existing ocular disorders such as: -

Uveitis, Opaque or Hazy media, Retinal disorders such as retinal vein or artery occlusions or retinitis pigmentosa, vitreoretinal degenerations, dystrophies, high myopia, glaucoma and cataract were excluded from the study.

Result

A total of 40 patients were included in the study, there were 26 male and 14 females patients.
Of the 40 patients included in the study,
30 (75%) had DR and10 (25%) did not have DR.
Various grades of CSME were detected in 17 patients (42.5%).
Patients were divided into four groups as follows.
Group 1 included patients with no DR (the control group).
Group 2 included patients with mild-to-moderate nonproliferative DR with or without haemorrhages.
Group 3 included patients with severe nonproliferative DR with small haemorrhages
Group 4 included patients with proliferative DR with massive HEs.

All patients were subjected to the following

1. **Full history taking:** Age of the patient, type of diabetes, duration of diabetes, mode of diabetic control, family history of diabetes mellitus and history of known ocular or medical diseases
2. **Clinical examination included:** Assessment of visual acuity, Refraction, Tonometry using applanation tonometer, Complete ophthalmological examination including slit-lamp biomicroscopy for anterior segment examination and using 78-D lens with or indirect ophthalmoscope with 20-D lens for fundus examinations and best-corrected visual acuity using illuminated Landolt chart
3. **Investigations**
   a. **Ocular**: Fundus Fluorescein Angiography and Optical Coherent Tomography
   b. **Systemic:** Lipid profile measurements using Fasting samples, Fasting and Post-Prandial blood sugar and HbA1c.

Serum lipid measurements were carried out using fasting samples.
For the purpose of analysis, dyslipidaemia was defined as follows:
Serum Total cholesterol > 160 mg/dl
Triglyceride levels > 150 mg/dl
Low-density lipoprotein (LDL) levels > 100 mg/dl
High-density lipoprotein (HDL) < 40 mg/dl for men and less than 50 mg/dl for women [6].
Patients were given antilipidemic therapy according to the type of lipid elevated by medical specialist as follows.
Atorvastatin 20 mg tablet was given daily after dinner for 2 weeks to patients with high total cholesterol or high cholesterol components [LDL and very-low-density lipoprotein (VLDL)].
After 9 months, the investigations were repeated again to see the effect of treatment.

Results

Between 1st January 2018 to 31st December 2019, 40 diabetic patients underwent this study, of whom 26 (65%) were male and 14 (35%) were female, and the mean age was 50.5 years (range = 20-80 years). Duration of diabetes ranged from 5 to 25 years. Thirty (75%) patients had DR and 10 (25%) patients did not have DR. various grades of CSME were detected in 12 diabetic patients (42.5%).
Prevalence of DR is significantly increased with increasing age ($P < 0.05$). Various stages of CSME were significantly increased with increasing age ($P < 0.05$). Prevalence of DR is significantly increased with increased duration of diabetes. Various stages of CSME were significantly increased with increased duration of diabetes ($P < 0.05$).

Dyslipidaemia was found in 25 (62.5%) diabetic patients. Dyslipidaemia was found in 21 (70%) DR patients.

Twelve patients (48%) out of the 25 dyslipidaemia patients had CSME.

Serum lipid profile, including total cholesterol, LDL, VLDL and triglyceride level were elevated in DR and CSME.The incidence of patients with elevated total cholesterol and triglycerides was 33% of all DR patients. The incidence of patients with elevated LDL and triglycerides was 23.5% of all DR patients. The incidence of patients with elevated LDL and VLDL was 20% of all DR patients. An overall 23.5% of all DR patients had normal lipid profile.

The percentage of patients with elevated total cholesterol and triglycerides was 30% of all CSME patients. The percentage of patients with elevated LDL and triglycerides was 23.5% of all CSME patients. The percentage of patients with elevated LDL and VLDL was 18% of all CSME patients. An overall 29% of all CSME patients had normal lipid profile.

Haemorrhages was present in 21 (70%) DR patients with total cholesterol level above 230 mg/dl. In addition, hemorrhage was present in 80% of DR patients with the ratio of total cholesterol level to HDL above 4.5.

Retinal exudate decreased in patients who had exudative DR and took antilipid therapy regularly by about 60% in all DR patients. Mean visual acuity was 6/12 in group 1 (the control group), 6/18 in group 2, 6/36 in group 3 and below 6/60 in group 4.Mean visual acuity improved one to two lines on Landolt chart to be 6/12 in group 2, 6/18 in group 3 and 6/60 in group 4

Discussion

It is observed that as the duration of diabetes increases, the chances of having DR and CSME also increase. Various studies have shown an association of dyslipidaemia with macrovascular complications of diabetes (e.g. coronary artery disease), but few have studied the association of serum lipids with microvascular complications such as DR and the available results are conflicting [6],[7] .

Early Treatment Diabetic Retinopathy Study (ETDRS) and Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR) showed a stronger evidence for the role of serum lipids in exudative maculopathy. In the ETDRS, it was also reported that higher baseline total and LDL-cholesterol levels increased the risk for retinal exudation by two-fold. Dornan *et al.* [6] found that there is an association between total serum cholesterol and DR.

In our study, we found that total serum cholesterol level is directly associated with the severity of retinal HEs in patients with DR and dyslipidaemia. These results were nearly similar to the results gained by Rema *et al.* [8] , who found that individuals with elevated total serum cholesterol, LDL-cholesterol, or triglyceride levels are more likely to have or develop retinal HEs, which can be associated with risk for vision loss, independent of the extent of macular edema. Patients with a total cholesterol/HDL-cholesterol ratio of 4.5 or greater were almost twice as likely to have retinal HEs compared with those with a ratio less than 4.5. Patients with a higher quartile of total cholesterol or LDL-cholesterol levels were 5-6 times more likely to have retinal HEs than those with lowest quartiles. Moreover, patients with elevated total cholesterol (240 mg/dl or 6.21 mmol/l) were twice as likely to have retinal HEs at baseline (odds ratio = 2.00; 99% confidence interval = 1.35-2.95).

Similar results were found when comparing the elevated LDL levels (160 mg/dl or 1.14 mmol/l) with the lowest level of LDL (130 mg/dl or 3.37 mmol/l) and the odds ratio was 1.97 (99% confidence interval = 1.3-2.96).

Patients with elevated cholesterol and triglyceride levels were 50% more likely to develop retinal HEs. Elevated serum cholesterol at baseline also increased the risk for visual loss by 50% compared with lower serum cholesterol levels.

Actions to Control Cardiovascular Risk in Diabetes (ACCORD) [12] is a randomized

controlled clinical trial with three components, determining the effects of lowering blood glucose, lowering blood pressure, and using fibrates to lower serum triglycerides and raise serum HDL-cholesterol levels (on a background of statin treatment) on cardiovascular disease in patients with type 2 diabetes, and a subset of participants with this study will be evaluated with a standardized protocol for comprehensive eye examinations and fundus photography consisting of the seven stereoscopic fields. An important association of DR with total cholesterol and serum triglycerides was showed[8].

High serum triglycerides have also been shown to be associated with the increased risk of the development and progression of retinopathy by Hadjadj *et al.*[13].

There has been increasing interest in the link between serum lipids and maculopathy in view of the evolving medical treatment. In type 2 diabetic patients, DME showed an association with increased LDL levels [12]. Elevated serum cholesterol at baseline also increased the risk for visual loss by 50% compared with lower serum cholesterol levels [9].

This association was maintained even after adjusting for age, as age by itself is a significant risk factor for hyperlipidaemia. The other significant finding in type 2 diabetes was that DME also showed a strong correlation with high LDL levels in the same study[8].

We also found that the risk for visual acuity loss was associated with both the presence and increasing severity of HE at baseline, adjusted for the presence and increasing severity of macular oedema.

Conclusion

DR is one of the most important causes of vision loss worldwide. Serum lipid levels have a significant effect on the severity of retinal HEs. As the density of these HEs increases, they tend to migrate towards the foveal centre where their deposition predisposes to subfoveal fibrosis. Lowering serum lipids has shown benefit on both proliferative DR and maculopathy.

References

1. Kulshrestha OP, Nayarand SK, Sharma DP. Role of serum lipids in diabetic retinopathy. Indian J Ophthalmol 1979; 27:116-118.
2. J Idiculla, S Nithyanandam, M Joseph, VKA Mohan, U Vasu, M Sadiq. Serum lipids and diabetic retinopathy: a cross-sectional study. Indian J Endocrinol Metab 2012; 16(Suppl 2) :S492-S494.
3. Aiello LP, Avery RL, Arrigg PG, Keyt BA, Jampel HD, Shah ST et al. Vascular endothelial growth factor in ocular fluid of patients with diabetic retinopathy and other retinal disorders. N Engl J Med 1994; 331 :1480-1487.
4. Sachdev N, Sahni A. Association of systemic risk factors with the severity of retinal hard exudates in a north Indian population with type 2 diabetes. J Postgrad Med 2010; 56 :3-6.
5. Frank RN. Diabetic retinopathy. N Engl J Med 2004; 30 :451-457.
6. Dornan TL, Carter RD, Bron A. Low density lipoprotein cholesterol: an association with the severity of diabetic retinopathy. Diabetologia 1982; 22 :167-170.
7. Larsson LI, Alm A, Lithner F, Dahlen G, Bergstrom R. The association of hyperlipidemia with retinopathy in diabetic patients aged 15-50 years in the county of Umea. Acta Ophthalmol Scand 1999; 77 :585-591.
8. Rema M, Srivastava BK, Anitha B, Deepa R, Mohan V. Association of serum lipids with diabetic retinopathy in urban south Indians - The Chennai Urban Rural Epidemiology Study (CURES) Eye Study-2. Diab Med 2005; 23 :1029-1036.
9. OM Jew, M Peyman, TC Chen, S Visvaraja. Risk factors for clinically

significant macular edema in a multi-ethnics population with type 2 diabetes. Int J Ophthalmol 2012; 5 :499-504.

10. Told DR, Baratsits M, Garhöfe GR, Schmetterer L. Early Treatment Diabetic Retinopathy Study (ETDRS) diabetic retinopathy study design and research group and baseline patient characteristics. 1991; 98:741-756.32. Early Treatment Diabetic Retinopathy Study Report Number 7. ETDRS. Ophthalmology 1991; 98 :741-756.
11. Klein BEK, Moss SE, Klein R, Surawicz TS. The Wisconsin Epidemiologic Study of Diabetic Retinopathy, XIII: relationship between serum cholesterol to retinopathy and hard exudate. Ophthalmology 1991; 98 :1261-1265.
12. ACCORD Eye Study Group, Chew EY, Ambrosius WT, Davis MD, Danis RP, Gangaputra S, Greven CM, et al. Actions to Control Cardiovascular Risk in Diabetes (ACCORD) Study Group; Medical Therapies effects on retinopathy Progression in Type 2 diabetes. N Engl J Med 2010; 363 :233-244.
13. Hadjadj S, Duly-Bouhanick B, Bekherraz A, Bridoux F, Gallois Y, Mauco G, et al. Serum triglycerides are predictive factor for the development and the progression of complications in patients with type 1 diabetes. Diabetes Metab 2004; 30 :43-51.