

Original article

Pattern of Corneal Diseases in Paediatric Age Group at a Tertiary Eye Care Center in Nepal

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Abstract

Objective: It is to study the pattern of corneal diseases (including injuries) in paediatric population in a tertiary eye care center. **Materials and methods:** A descriptive, cross sectional study was carried out in a tertiary eye care center which included 176 cases. **Results:** Out of 176 cases studied, 6 cases (3.4%) presented with congenital causes, 4 cases (2.27%) were of dystrophy and ectasia, 63 cases (35.79%) had infective origin, 17 cases (9.65%) had inflammatory cause, 9 cases (5.11%) had systemic association and 77 cases (43.75%) had traumatic causes. **Conclusion:** Trauma was noted to be the most important cause for corneal diseases in paediatric population followed by infective conditions. Viral keratitis was found to be the most common type of corneal infection in the paediatric age group.

Keywords: corneal diseases, paediatric age group

Introduction

Childhood blindness is a major public health issue worldwide. It is estimated that there are 1.4 million children who are blind and additional 5 million visually disabled. A total of 500,000 children go blind each year in the world, of whom 60-80% die in the subsequent 1-2 years from the disease that contributed to their blindness, or from neglect consequent upon being blind (Lewallen S et al, 2001; Kagame K et al, 1989). The major causes of blindness in children vary widely from region to region, being largely determined by socioeconomic development, and the availability of primary health care and eye care services (Gilbert et al, 2001). In under developed and developing countries corneal scarring as a result of acquired diseases is the most important cause of severe

visual impairment and blindness (Sinha R et al, 2005). The available data suggests that corneal scarring is the most important cause of avoidable blindness, followed by cataract and ROP worldwide (Gilbert et al, 2001). Thus, corneal scarring is included in the list of conditions that are priorities for control in WHO's VISION 2020 program. This study was undertaken to identify the pattern of corneal diseases in paediatric age group in our setup.

Materials and methods

It was a hospital based cross sectional study carried out over a duration of 18 months, from January 2011- July 2012 at B P Koirala Lions Center for Ophthalmic Studies, TUTH, Kathmandu targeting all paediatric (0-16 years) patients presenting with corneal diseases to the hospital. An informed consent was taken from the guardian of each patient. Ethical approval was obtained from the Institutional Review

Received on: 25/08/16

Accepted on: 10/12/16

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Board (IRB) of the Institute of Medicine; the study was conducted adhering to the principles of the “Declaration of Helsinki”.

The diagnosis was made on basis of detailed ocular examination and relevant investigations wherever needed. Visual acuity assessment was done with torch light in infants and neonates and with Catford drum, k- pictures and Lea-symbols in preverbal children. Snellen’s distant visual acuity chart was used for the verbal and school going children. In cases of visual acuity less than 3/60, vision was expressed as counting fingers at a particular distance, expressed in meters. If inability to count finger was there then visual acuity was evaluated for hand movements close to face (HM). Where hand movement was not appreciated, there perception of light (PL) and projection of rays (PR) were used for visual acuity evaluation. Lastly, the eye not perceiving light was placed under category of NPL (No Perception of Light).

Anterior segment examination was carried out with the help of Haag-Streit 900

Slit Lamp in cooperative children and magnifying loupe was used with gentle retraction of lids to evaluate the anterior segment in children who were uncooperative for table mount slit lamp examination of eyes. Hand held slit lamp was used as and when needed. Examination under anaesthesia was performed wherever required and in cases which required surgical intervention. A thorough and careful examination of the fundus was done using Heine Beta 200s direct ophthalmoscope and binocular indirect ophthalmoscope with +20 D lens and with Haag-Streit 900 slit lamp using +90D lens. Intraocular pressure (IOP) was measured in cases requiring IOP evaluation. Air puff non-contact tonometer or Goldman applanation tonometer was used for this purpose. During examination under anaesthesia, Perkins hand held applanation tonometer was used.

Photographic documentation in all possible cases was done at the time of presentation.

Investigations such as conjunctival swab, corneal scraping for culture and different biological stains, routine blood and urine examination were done in some cases to confirm the diagnosis of the corneal disease, Ultrasound B scan, X Ray and Computed Tomography Scan were done when required. Patients with systemic association along with ocular affliction were referred to paediatric and/or other relevant departments so as to find the systemic condition that possibly was thought to be associated with ocular disease. Apart from the investigations mentioned above, other relevant investigations were carried out as per the need to establish the diagnosis.

A proforma was used to record detail information and ocular findings at the time of presentation. The data was analyzed using SPSS data analysis sheet.

Results

A total of 176 cases were included in this study, age ranging from 0-16 years. (Table 1) Mean age was found to be 8.54 years In the study, male patients contributed for 58.52% (103) of total number of cases, whereas female patients constituted for 41.47% (73) of the total with the ratio of male: female being 1.4:1. 1.

Out of the various patterns of corneal diseases the majority of cases were of trauma, followed by infective cases. This was followed by inflammatory cases, cases of corneal diseases with systemic association, cases of congenital corneal anomalies, and cases of dystrophies and ectasias respectively (Table 2, Figure 1).

In cases presenting with congenital disorders, 3 cases were of megalocornea secondary to congenital glaucoma and 3 cases were of microcornea. Out of 4 cases of dystrophies and ectasias 2 cases were of Congenital Hereditary condition.

Endothelial Dystrophy (CHED) and 2 cases were of keratoconus. Corneal conditions with systemic disorders included 4 cases of corneal xerophthalmia, 2 cases of exposure keratopathy, 2 cases of KF ring in Wilson's disease and 1 case of corneal involvement in Stevens Johnson Syndrome. Inflammatory diseases included 15 cases of Vernal Keratoconjunctivitis(VKC) and 2 cases of band keratopathy secondary to uveitis. Infective conditions were dominated by viral keratitis with 49 out of 63 cases, however, corneal ulcers following trauma were included in traumatic cases along with cases of corneal perforations, abrasions and corneal foreign body.

It was found that cases with congenital disorders mostly presented in 0-5 years of age. Dystrophies and ectasias presented only from 6 years onwards in the present study. Number of infective and inflammatory cases increased with increasing age. Cases with systemic association, however, followed no particular pattern and so did traumatic cases (figure 2).

Out of the total 176 cases, more than 2/3rd of cases had unilateral presentation and the rest had bilateral (figure3). It was noted that cases having congenital causes, dystrophies and ectasias and those having corneal problems associated with systemic diseases were all bilateral in presentation. Inflammatory disorders had bilateral presentation more than unilateral. Infective and traumatic cases had more unilateral presentation than bilateral (figure 4)

Table 1: Age distribution

Age group	No. of cases	Percentage
0-5 years	48	27.27%
5-10 years	62	35.22%
10-16years	66	37.5%
TOTAL	176	100

Table 2: Distribution of cases according to

the cause

Cause	No. of cases	Percentage
Traumatic	77	43.75%
Infective	63	35.79%
Inflammatory	17	9.65%
Systemic	9	5.11%
Congenital	6	3.4%
Dystrophies/ectasias	4	2.27%
TOTAL	176	100%

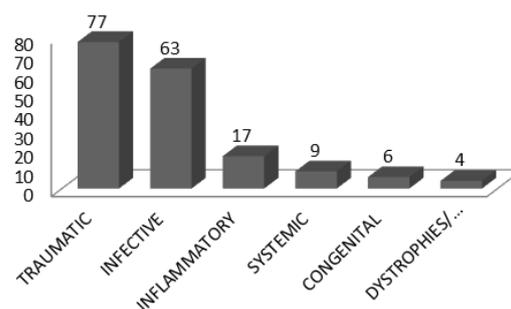


Figure 1: Distribution number of cases in each category

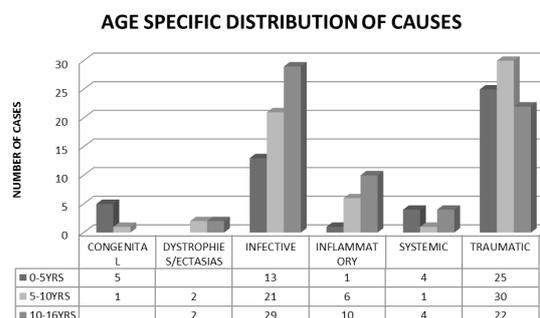


Figure 2: Age specific distribution of cases of various causes

LATERALITY

■ RIGHT EYE ■ LEFT EYE ■ BOTH EYES

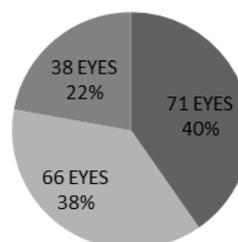


Figure 3: Laterality of the cases

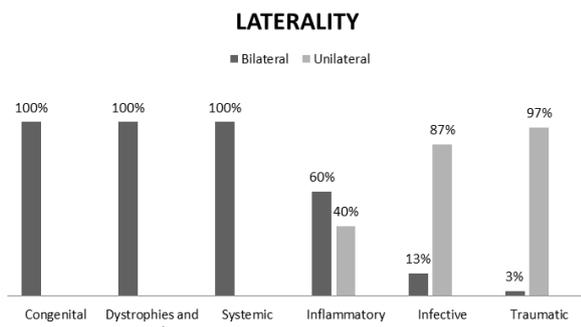


Figure 4 : Laterality in each category

Discussion

In day to day set up we come across a varied spectrum of corneal diseases in all the age groups, but not much of work has concentrated upon the corneal diseases in paediatric age group. Hence, this study was undertaken to identify the pattern of corneal diseases in paediatric age group in our set up.

In our study it was noted that number of cases with corneal involvement increased with increasing age in paediatric group. This might be due to the fact that older children are more exposed to external environment and parent unguided activities, and hence, they become more susceptible to injuries and infections, including that of eyes and cornea.

83.34% of the cases with congenital diseases belonged to the age group of 0-5 years of age, Externally visible congenital anomalies like that of cornea are noted early by the family members and children with such problem are brought early to the hospital.

In cases with corneal dystrophies and ectasias, no case in our study presented in 0-5 years of age, indicating that problems associated with dystrophy and corneal ectasia are noted rather late by the family members when visual problems in these cases are recognized. Family members' attention is drawn when the children are found to have subnormal visual ability in comparison to their normal peers.

Age distribution in inflammatory cases which

constituted of 15 cases of VKC, showed a trend of increment in number with increasing age of the cases in the study group. This might be due to the fact that with increasing age and exposure to external environment children can have greater risk of encountering allergens leading to initiation and triggering of hypersensitive phenomenon leading to VKC.

In cases with infective diseases too the number of cases increased with increase in age, which is comparable to a study conducted by Singh et al, for analysis of childhood microbial keratitis, where 50.5% cases were from the 10 to 15 age group and the rest were below 10 years of age (Sommer A, 1989).

In present study male patients constituted for 58.52% of total cases whereas female patients constituted 41.48%. More number of male patients may be due to the reason that male children are more involved in outdoor activities than female children, and also due to the fact that in our society health issues of a male child get more attention than that of a female child.

A study conducted by Adhikari et al at King Mahendra Memorial Eye Hospital Bharatpur, Chitwan, to analyze corneal injuries, reported more corneal lesions in males (59%) than females (41%). This trend is seen in our study as well, but our study includes paediatric population alone whereas the mentioned study had cases of all ages (Adhikari RK, 2010). Our finding is also similar to the study carried out by Sethi et al in Pakistan, to identify pattern of common eye diseases in children, where 60.8% of total cases were males and 39.1% were females (Sethi S et al, 2008).

Our study found that cases having congenital causes, dystrophies and ectasias and those with systemic associations were all bilateral in presentation. Inflammatory disorders had more cases with bilateral presentation than unilateral. Infective and traumatic cases had unilateral presentation more than bilateral.

In present study, out of the various patterns of corneal diseases, maximum number of cases (43.75%) had trauma as the main cause followed by infective cases (35.79%) without trauma. The cases which had trauma to start with and followed by other subsequent pathology, were included in traumatic category of the cases. In our study traumatic corneal lesions were 43.75% and non-traumatic corneal lesion were 56.25%. Our findings differ from that of the study carried out by Adhikari et al, where among all the corneal lesions, traumatic corneal lesions (59.68%) were more than non-traumatic corneal lesions (40.32%) (Adhikari RK, 2010). Out of 18 cases that presented with corneal ulcer in our study, 10 cases (55.55%) had no association with trauma while 8 cases (44.45%) developed corneal ulcer after trauma. In a study done by Singh et al, to analyze childhood microbial keratitis in South India, 69% of cases had trauma predisposing to corneal ulceration and in 30% cases, no predisposing factors were found (Singh G et al, 2006)

In a study carried out by Foster et al, in which 130 Tanzanian children with corneal ulceration were clinically examined to determine the cause of the ulceration. Vitamin A deficiency was responsible for 26.2% which is very different from our results which had only 4 cases of xerophthalmia in total (Foster A et al, 1987).

Conclusion

In our study of 176 children with corneal problems there were more males than females. Also, this study shows that the number of cases with corneal diseases increased with increasing age in paediatric population in our set up. Congenital causes, dystrophies and ectasias, and corneal diseases with systemic associations mostly had bilateral presentation whereas traumatic and infectious cases had unilateral involvement more frequently.

Trauma was noted to be the most common cause of corneal disease, followed by infective cause in our study.

In conclusion, almost all types of corneal diseases presented in our set up in paediatric population. Trauma and infection were the two most common causes of corneal affliction. Hence, we should plan our paediatric corneal care in a way

so that proper and prompt management can be made available for corneal trauma and infection. This will be helpful in preserving the vision of young population afflicted by such conditions and can help them to achieve their potential in their future, which may be hindered by visual anomaly in lack of proper and timely management of their corneal disease. Uncared state of corneal pathology in paediatric age may lead to blindness and visual impairment in this population which has a longer life expectancy in comparison to more aged population and thus their subnormal visual status may lead to greater burden to family and economic loss to the nation in long run.

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Source of support: nil. Conflict of interest: none