A study of ocular morbidity and ocular surface status in street children of Kolkata and its suburbs

Briti Sundar Naiya

Abstract

Background: To report the ocular morbidity status among street children. Material and Method: 1000 street children from Kolkata and suburban areas were examined over a period of 1.5 years for vision, cycloplegic refraction, presence of squint, color vision, sodium fluorescene staining test and Schirmer’s test. Anterior segment evaluation was performed with a portable slit lamp biomicroscope. Posterior segment was evaluated by direct ophthalmoscope after papillary dilatations. Results: Majority of the street children were within 6-10 years age group (n=440, 44%). 79.72% of street children were getting formal education. 48.1% were underweight. No association was found between dry eye and refractive error. Overall ocular morbidity was found among 29% children. Allergic conjunctivitis was the leading cause (16.3%) of ocular morbidity followed by refractive error (8.6%). Conclusion: Allergic conjunctivitis and refractive error are two important cause of ocular morbidity among street children from Kolkata.

Keywords: Ocular morbidity; Ocular surface; Street children.

The United Nations Children’s Fund (UNICEF) describes a street child as “any girl or boy who has not reached adulthood for whom the street (in the broadest sense of the word, including unoccupied dwellings, wasteland etc.) has become his or her habitual abode and/or source of livelihood, and who is inadequately protected, supervised or directed by responsible adults”1,2. UNICEF classifies street children into four categories: child of the street, child on the street, child of a street family and child in institutional care3. In 1989, UNICEF estimated that 100 million children were growing up on urban streets around the world4. Ocular morbidities mostly originate in childhood and if undetected it may cause serious ocular disabilities in the later part of the life. In case of school children it may early detected during the early years of school life but in case of street children it may remain undetected for a longer period due to lack of early schooling. The phenomenon of street children is rapidly becoming one of global epic proportions. Ten years ago, UNICEF estimated that over 30 million children worldwide work and/or live in the streets, for circumstances usually beyond their control, and often without family support.

The epidemic of street children is global issue. Global urbanisation is attributed to growing numbers of homeless children. Many children leave their homes in smaller towns to work in larger cities. Estimations on how many children are living on the street are between 10 million and 100 million globally. Street children move frequently and are often reluctant of adults. So information on the children is limited. Poverty, violence, lack of family support and hunger are some of the main reasons children choose to move to the street. Street children are typically between the ages of 6 and 16 years old and live without adult support. Africa, Asia and Latin America have the highest number of street children. Almost all countries have children who are homeless and living in the streets. In developing countries like India, street children comprise of a large proportion of child population. With this background, it was envisaged to estimate the prevalence of ocular morbidity amongst street children in Kolkata and its suburbs treat the treatable to prevent ocular morbidity and to study the socio-demographic factors responsible for the causes of Ocular morbidity in the street children.

Materials and Methods:

This is a cross-sectional community-based study (duration 1.5 years) conducted among street children (n=1000) aged younger than 16 years in the Kolkata and its suburbs.
its suburbs for a period of one and half years. This study had been conducted under street children programs, from Regional Institute of Ophthalmology (Kolkata). Prior to this study ethical committee clearance was taken from Medical College and Hospital (Kolkata). Other variables studied were age (as per the parent’s information), sex, religion, BMI (Body Mass Index)calculated as weight (Kg)/ Height (mt)$^2$, parental occupation and socio-economic status. Children without legal guardians were excluded from this study.

Various points of Kolkata where street children live were visited for collection of data for this study. A vehicle with all the necessary ophthalmological equipment was granted by XOVA for the street children programme. The history was taken and then the children were examined as per aforesaid questionnaire format. A proforma was filled in to collect the data about their parents’ educational status, profession and approximate monthly income. Visual Acuity, for distant vision was tested at a distance of six meters under adequate illumination with Snellen’s chart (provided with the vehicle); each eye was tested separately. Near vision was tested by Jaeger’s chart, keeping at a distance of 25-30 cm from both the eyes of the subject. Pinhole vision was tested to differentiate refractive error from posterior pole pathology in cases of low visual acuity (less than 6/9). Objective refraction was performed with retinoscope which was followed by subjective refraction till the best corrected visual acuity was achieved. Mydriatics (cyclopentolate, tropicamide) were used prior to streak retinoscopy in street children with visual acuity less than 6/6. Finally, spectacle power was prescribed after testing acceptance. Children already wearing spectacles were also examined and change in refractive error was noted. The visual acuity was tested with appropriate lenses. Each eye was tested separately. All children with refractive error were provided with spectacles free of cost. Cover/uncover test was done to detect phoria/tropia.

Color vision testing was done by Ishihara’s pseudo-isochromatic plates. Anterior segment and posterior segment examination was done. Detailed anterior segment evaluation was done by a portable slit lamp. Posterior segment evaluation was done by direct ophthalmoscope. Fundus evaluation under mydriasis was carried out with 0.5% tropicamide with cases with media opacities. Schirmer’s test & sodium fluorescene staining test to measure the tear film break up time was done.

Anthropometric measurements were taken by weighing machine and measuring tape. Weight was on flat surface, pointer to be placed at ‘0’point, minimum possible clothing, measurement to be taken without shoes, measurement to be accurate to nearest 100grams. Height was measured on flat surface, standing against the wall, without wearing shoes, calibration to be accurate to nearest 0.5cm. Statistical Analyses were performed using IBM SPSS statistics 19.0.0 version software. Master chart was prepared by Microsoft excel and then loaded onto the SPSS software.

Results:

This study was a cross-sectional, observational study to detect the ocular morbidity and ocular surface status in street children in Kolkata and its suburbs. The study was conducted from January 2015 to August 2016 in 1000 children in various streets of Kolkata. Majority of the street children were within 6-10 years age group (n=440, 44%). And also the number of street children in 0-5 age group (29.1%) was 291 and in 11-16 age groups (26.9%) was 269. Among the street children the number of males (50.2%) were 502 and the rest (n=498, 49.8%) were females. Religion wise; Hindus (n=554, 55.4%) were higher than Muslims (n=398, 39.8%) and percentage of other religion (n=48, 4.8%) were less. Based on BMI, total street children were divided in four groups (underweight, normal, overweight, and obese). The number of underweight street children (n=481, 48.1%) was maximum, followed by normal (n=443, 44.3%), overweight (n=75, 7.5%) respectively. Only one child was obese.

In the present study, Out of 1000 street children 661 were getting education (66.10%). Out of those 661 street children 134 were getting non formal education (NFE) (20.27%). And 527 street children were getting formal education (79.72%). Among the total students in the formal education group, children of class 1(n=115) and class 2(n=123) were more in comparison to other classes. No association was found between dry eye and refractive error. Out of 837 emmetropic street children; 74 were found having dry eye (8.84%), 3 out of 57 myopic street children were found having dry eye (5.26%). No dry eye was found in hypermetropia and astigmatism. No sex predominance was found in the context of dry eye. 39 out of 502 males were found as dry eye (7.76%), 38 out of 498 females were found as dry eye (7.63%).

In the present study the myopic street children were divided into three age groups 0-5 years, 6-10 years, and 11-16 years. 14 out of 57 myopic street children was in the group...
of 0-5 years age (24.56%), 16 out of 57 myopic street children were in the 6-10 years group (28.07%) and in the last group there were 27 street children (47.36%). Majority of these myopic street children were corrected by lens with d"-1.50D. Only a few children (n=3) required greater than -1.50D lens. In case of hypermetropia the children were divided in the same manner as previous. 4 out of 14 hypermetropic street children were in the age group of 0-5 years (28.57%), 9 out of 14 hypermetropic street children were in the age group of 6-10 years (64.28%) and only 1 out of 14 was found as hypermetropic in the last age group of 11-16 years (7.14%). 1 out of 15 street children with astigmatism was found in between 0-5 years (6.66%), 8 out of 15 street children with astigmatism were found in between 6-10 years age group (53.33%), and 6 out of those 15 street children with astigmatism were found in between 11-16 years (40%).

Discussion:

Overall ocular morbidity in our study was 29%. A similar from Kathmandu valley reported ocular morbidity rate as 31.6%.[5] This study reported highest ocular morbidity in greater than 15 years age group as compared to 6-10 years age group in our study. We reported allergic conjunctivitis as most common cause of ocular morbidity followed by myopia. The study from Nepal found conjunctivitis as the prime cause followed by refractive error. In another study from Kathmandu by Ghising et al; we found simple hyperopia followed by myopia and astigmatism as the prime refractive errors in mentally retarded children.[6] Shrestha et al. working on the children staying in different orphanages in Kathmandu valley reported 17.9% prevalence of ocular morbidity.[7] They reported refractive error as the prime cause of ocular morbidity as compared to allergic conjunctivitis in our study. Prevalence of ocular morbidity in a similar study from Shimla among urban school children (both government and private schools) was 31.6% as compared to 29% in our study.[8] Like the similar studies from Nepal; they also reported refractive error as the prime cause of ocular morbidity. But a low prevalence of refractive error (3.3%) had been reported among urban non-school going slum children in Ahmedabad.[9]

The major volume of ocular morbidity in this study is contributed by allergic conjunctivitis and refractive error. In the present study the overall amount of allergic conjunctivitis and refractive error were 16.3% and 8.6% respectively. This may be due to the dusty and polluted environment of the street where the eyes of the children are exposed to various obnoxious gases and particles. Kumar et al and Bagchi et al had reported a low prevalence of ocular morbidity (5.4% and 4.03% respectively) in their study from Delhi and Bankura[10,11]. A study conducted by Das et al on school children of Kolkata found a prevalence of 25.11% refractive error in 5-10 years of age group with increasing proportion of cases in higher age group, a similar trend has also been noted in the context of street children in the present study[12]. Alam et al in their study of Urdu speaking children of Karachi found a prevalence of refractive error 8.9% which is very similar to the present study of street children of Kolkata (8.6%)[13]. In the present study on street children myopia was the most common refractive error. Das et al, Bagchi et al and Mondal et al also found myopia as a leading cause of refractive error in their study on students also[11,12,14].

Amongst other causes of ocular morbidity, squint, and color blindness were prominent. Over all number of squint was 3 (0.003%) and total number of color blindness was 9 (0.009%). Gupta et al reported a prevalence rate of 2.3% in school children of Shimla[4]. Desai et al in their study on school children of Jodhpur found a prevalence of 2.8%, Kumar et al reported 1% prevalence in school children of Delhi[15,10]. But no data on the prevalence of color blindness in street children was found. The present study however recorded 9 cases out of total number of street children of Kolkata (0.90%). A study on the Brazilian preschool children for the detection of vitamin A deficiency[16]. They concluded that elevated proportions of vitamin A deficiency in its subclinical form were observed in that study population. But no case of xerophthalmia was observed during the present study. This could be due to the vitamin A prophylaxis being given along with the successfully running National Immunization Program and food fortification. Xerophthalmia cases have become rare finding in street children of Kolkata nowadays.

The limitation of the study was lack of exact enumeration of street children, making determination of sample size difficult; so randomization was lacking. Detailed history related to use of drugs, vulnerability of abuses, social context, belief, cultural practices, awareness related to health, psychological perspectives and detailed educational status could not be assessed.

References:


