PEDiatric Ophthalmic disorders

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Summary

All pediatric patients with ophthalmic disorders admitted in the department of Ophthalmology, Post Graduate Medical Institute Hayatabad Medical Complex Peshawar from 1st April 1999 to 31st March 2000 are included in the study. The objectives of the study were: (a) To find out the prevalence and types of Pediatric Ophthalmic disorders in North West Frontier Province. (b) To identify possible etiological factors. (c) To analyze the anatomical site of abnormality.

A standard WHO/PBL examination card was used for data collection. Out of the 464 patients studied with Pediatric Ophthalmic disorders, 307 (66.2%) were male and 157 (33.8%) were female. Whole globe was involved in 43 (9.3%), and Cornea and Sclera in 97 (20.9%) patients. Lens was affected in 139 (30%), Uvea in 3 (.64%), Vitreous and Retina in 9 (.936%), Optic Nerve in 3 (.64%), Ocular Muscles in 63 (13.5%) and Central nervous system was affected in 3 (.64%) patients. Hereditary factors accounted for 97 (21%) of Pediatric Ophthalmic disorders. Intra Uterine factors accounted for 10 (3%) and prenatal / neonatal factors for 9 (2.1%), postnatal for 323 (50%) and in 116 (25%) aetiology was unknown. Medication was given to 49 (10.5%) cases, surgery alone was performed in 33 (71.76%), both medication and surgery was given to 78 (16.8%) and 4 (0.86%) patients needed observation only. Vision was likely to improve in 322 (69.3%), was likely to remain stable in 56 (12.06%) and was likely to deteriorate in 86 (18.5%) patients.

Introduction

Pediatric ophthalmic disorders are important because of their impact on child’s development, education, future work, opportunities and quality of life. Approximately 1.5 million children are blind in the world. Half of such blindness is preventable or treatable. Pediatric Ophthalmic disorders may be due to causes that operate in prenatal period, neonatal period and childhood. The site of lesion can be in the orbit, eyelids, whole globe, conjunctiva, cornea, sclera, lens,
vitreous, retina, uvea, optic nerve or nervous system. Strategies to manage Pediatric Ophthalmic disorders should therefore include interventions at all the three levels i.e. primary, secondary and tertiary prevention. Possible medical measures included optical, orthoptic, medical or surgical interventions.

**MATERIAL AND METHODS**

We have studied all pediatric patients with ophthalmic disorders admitted in the Department of Ophthalmology Postgraduate Medical Institute Hayatabad Medical Complex Peshawar from 1st April 1999 to 31st March 2000. A modified Standard WHO/PBL examination card was used. In addition to the name, age, sex, father’s name, father’s occupation and address, inquiry was made into consanguinity, family history and previous eye surgery. General assessment was also done. On anatomical basis the disorders were divided into the disorders affecting whole globe, cornea, lens, uvea, retina, optic nerve, ocular muscles and nasolacrimal duct system. On etiological basis they were divided into hereditary, intrauterine, prenatal, postnatal and diseases of unknown etiology. On treatment basis they were divided into those who were given medical treatment, those who received surgical treatment, those who received both medical and surgical treatment, those who received optical treatment and those who were given no treatment. Prognosis for vision was described as could be improved, likely to remain stable and likely to deteriorate (fig 1-3).

**TABLE-1**

<table>
<thead>
<tr>
<th>Aetiology Factors</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereditary</td>
<td>21%</td>
</tr>
<tr>
<td>Intrauterine</td>
<td>03%</td>
</tr>
<tr>
<td>Perinatal / Neonatal</td>
<td>02%</td>
</tr>
<tr>
<td>Postnatal / Infancy / Childhood</td>
<td>50%</td>
</tr>
<tr>
<td>Cannot determine (unknown Aetiology)</td>
<td>25%</td>
</tr>
</tbody>
</table>

Fig. 1: Congenital Ocular Anomalies.

Fig. 2: Burns due to chemicals.

Fig. 3: Child suffering from Retinoblastoma. (A malignant tumour).
PREVALENCE AND TYPES OF PEDIATRIC OPTHALMIC DISORDERS IN N.W.F.P.

Percentage of Children Admitted in Eye a unit from 1st April to 31st March 2000

![Pie chart showing distribution of children admitted to the eye unit.](image)

(Fig. 4)

**RESULTS**

We studied four hundred and sixty four patients with Pediatric Ophthalmic disorders (Fig. 4). 307 (66%) were male and 157 (33.8%) were female (Fig. 2) 32 (6.9%) patients presented in 1st year of life while 432 (39.1%) patients belonged to age group of 2nd to 15 years. Consanguinity was present in 335 (72.1%) patients. In 433 (93.3%) patients, ocular problem appeared for the first time while in 31 (6.8%) patients previous eye surgery was performed. General disability occurred in 4.5%; within this group, mental handicap accounted for 8 (38%), deafness for 3 (14%), speech disorder for 6 (28%) physical handicap for 4 (19%). Right eye was involved in 153 (32.9%) patients; left eye in 149 (32%) and 302 (65%) patients had bilateral disease. Whole globe was involved in 43 (9.3%), eye lids in 11 (2.4%) conjunctiva in 11 (2.4%), Cornea and Sclera in 97 (20.9%) Lens was affected in 139 (30%), Uvea in 3 (64%).

**PREVALENCE AND TYPES OF PEDIATRIC OPTHALMIC DISORDERS IN N.W.F.P.**

Sex wise distribution of Pediatric Ophthalmic Disorders

![Pie chart showing sex distribution of pediatric ophthalmic disorders.](image)

(Fig. 5)

Vitreous and retina in 9 (1.9%). Optic Nerve was effected in 3 (.64%), ocular muscles in 63 (13.5%) and central nervous system was effected in 3 (.64%) patients (Fig. 5). Hereditary factors accounted for 97 (21%) of pediatric ophthalmic disorders, intrauterine factors for 10 (3%), Perinatal / neonatal for 9 (2%), postnatal for 232 (50%) and in 116 (25%) etiology was unknown (Fig. 6). In diseases of eye lids, 22 (55%) had Prosis, 2 (5%) had Coloboma of the lid and 1 (2.5%) patient had lid Abscess table 1).

Among diseases of the whole globe and orbit, Glaucoma was present in 32 (34%), Endophthalmitis in 10 (13.6%),
Panophthamitis in 1 (1.3%) and Hyphaema in 11 (15%) Globe was removed in 3 (4.1%), Orbital Cellulitis was present in 5 (6.8%), Dermoid cyst in 5 (6.8%) and rhabdomyo-sarcoma was present in 1 (1.36%) patient.

In diseases of nasolacrimal duct system Chronic Dacrocystitis was present in 8 (89%) and failed DCR in 1 (11%) patient.

In diseases of conjunctiva, Blepharocon- junctivitis was present in 2 (18%), Oph- thalmia Neonatorum in 1 (9%) Vernal Catarrh with Plaque in 6 (55%) and Membranous Con-junctivitis in 1 (9%) patient.

In Corneoscleral diseases, Corneal perforations occurred in 45 (46%), Corneoscleral perforation (in 20 (20.6%) Cystosis in 1 (1%), Megalocornea in 1 (1%), Corneal opacities in 2 (2%) corneal ulcers in 16 (16.5%), Vitamin A deficiency in 7 (7.2%) burns in 2 (2%), staphylomas in 2 (2%) and interstitial keratitis in 1 (1%).

In Lens disorders, aphakia was present in 16 (11.5%), cataract in 121 (87%) and cataract with anterior segment abnormalities in 2 (1.5%). Among disorders of uveal tract, aniridia was present in 1 (33%), coloboma in 1 (33%) and uveitis in 3 (64%).

Among disorders of vitreous and retina, 1 (11.11%) patient had Sticklers syndrome, 1 (11.11%) had Acute Posterior Multifocal Placoid Pigment Epitheliopathy, 4 (44%) had Retinal detachment and 3 (33%) had Retinoblastoma.

In disorders of the optic nerve, 2 (66%) had optic Neuritis and 1 (34%) patient had papilloedema.

Among patients of squint, 48 (77%) had convergent squint and 14 (23%) had divergent squint. Among disorders of Nervous system 1 (33.3%) patient had internuclear Ophthalmoplegia, 1 (33.3%) had partially thrombosed Cavernous sinus and 1 (33.3%) had facial palsy.

369 (79%) children had no visual impairment, 58 (12%) had visual impairment, 14 (3%) had severe visual impairment, and 23 (.4%) were blind.

Medication was given to 49 (10.5%), surgery alone was performed in 333 (71.76%). Both medication and surgery was given in 78 (16.8%) and 4 (.86%) patients needed only observation.

Vision was likely to improve in 322 (69.3%), was likely to remain stable in 56 (12.06%) and was likely to deteriorate in 86 (18.5%) patients.

**DISCUSSION**

The occurrence of Pediatric Ophthalmic disorders in this study was 16.8%, within the group 66.2% (307) were male while 33.8% (157) children were female. These findings are quite similar to the study of children attending blind schools in India where 58% (164) of the severe visually impaired/ blind, children were male.

Corneal diseases accounted for 20.9% (97) of all children with Pediatric Ophthalmic disorders within this group corneoscleral perforation was responsible for 67%, corneal opacities and Ulcers for 18.6%, Vitamin A deficiency for 7.2%, Interstitial keratitis for 3.1%, burns for 2.1% megalocornea for 1.0% and Cystosis for 1.0%. This can be compared with study of blind schools in India where corneal diseases accounted for 26.4% (348) of all children with severe visual impairment / blindness. This reflects the high occurrence of ocular trauma in Pakistan and Vitamin A deficiency as a leading cause of corneal blindness in India. Blind school studies in other countries show the contribution of Vitamin A deficiency to range from 50 % in East Africa (Ethiopia, Malawi, and
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Tanzania, to 25% - 40% in West Africa (Ghana, Togo, Benin), and 1% in Chile. This range probably reflects the differences of Vitamin A deficiency and its associated diseases. Measles for example is particularly important as a predisposing factor in African countries. Diarrhoeal diseases are known to be important in Asia. Such differences show the success of primary health care interventions, such as measles immunization, teaching of oral dehydration practices, and nutrition education programmes in operation in these countries. In another study corneal scarring secondary to bacterial, viral and fungal keratitis was the commonest cause of blindness in Punjab.

Disorders of whole globe and orbit accounted for 18.2% (84) of severe visually impaired / Blind. In the disorders of whole globe and orbit, glaucoma was present in 32 (34%), Endophthalmitis in 11 (15%), GLOBE was removed in 3 (4.1%), avulsed in 1 (3.6%), Orbital cellulitis occurred in 5 (6.8%), congenital anomalies in 5 (6.8%) and Rhabdomyosarcoma in 1 (1.36%). This can be compared with another study done in India where among disorders of whole globe, Glaucoma was diagnosed in 2.6% (34) of severe visually impaired / Blind children, congenital anomalies of the whole globe i.e. anophthalmos (72) and microphthalmos (156) were responsible for 17.3% cases of Severe visual impairment / Blindness, unknown causes effecting whole globe (53) and removed globes (3) accounted for a further 8% of severe visually impaired / Blind. The incidence of childhood glaucoma is estimated at 1/10,000 births that is 2-3 cases / million population / year.

In this study diseases of Lens accounted for 30% (139) severe visually impaired / blind children. In Lens diseases aphakia was present in 16 (11.5%), cataract in 121 (87%) and cataract with anterior segment abnormalities in 2 (1.5%). These findings are similar to the study of blind schools in India where Lens diseases were seen in 12.3% (162) of children. The major causes of bilateral cataract in South Asia are rubella 25% heredity 25% and unknown 50%.

Diseases of uveal tract accounted for 0.64% (3) Within the group, uveities was responsible for 33.35 (1), coloboma for 33.3% (1) and aniridia for 33.3% (1). These results are similar to another study in India where disorders of Uvea were seen in 5.8% of children: coloboma (46), aniridia (16) and uveities (15). The high occurrence of congenital anomalies may be due to cousin marriages. The congenital ocular anomalies appear to be relatively more important in India than other developing countries due to first cousin marriages and maternal uncle / nice marriages common in South India.

Disorders of vitreous and retina accounted for 1.9% (9) within the group retinal detachment was responsible for 44.4% (4), retinoblastoma for 33.3% (3). Acute Posterior Multifocal Placoid Pigment Epitheliopathy for 11.1% (1) and sticklers syndrome for 11.1% (1). This can be compared with study of blind schools in India where retinal disorders were responsible for 20.7% (273) of children with severe visual impairment / Blind. The majority were retinal dystrophies (242) albinism (13) with other retinal disorders including retinopathy of prematurity (3) accounting for the remainder.

Disorder of optic nerve accounted for 0.6% (3) Severe visually impaired / Blind children: 64% (2) had retrobulbar neuritis and 36% (1) had papilloedema. In study of blind schools in India, optic nerve disorders were seen in 5.9% of children, secondary optic atrophy (59) and optic nerve hypoplasia (14) being the major causes. The likely causes of optic nerve disease in South Asian countries are infection (meningitis, encephalitis) cerebro hypoxia at birth and head injuries. In Western countries optic nerve / higher visual pathway disease accounts for
20-40% of all new blind registration in children. The major causes in Western world are cerebral hypoxia at time of birth. Optic nerve disease may also occur with use of teratogen e.g. excess alcohol in pregnancy and possibly abortifacients.

The causes of pediatric ophthalmic disorders were also classified according to the time of known insult resulting in visual loss. Hereditary factors accounted for 97 (21%) of pediatric ophthalmic disorders, intrauterine factors for 10 (3%), Perinatal/neonatal for 9 (2%), postnatal for 232 (50%) and in 116 (25%) etiology was unknown (Fig. 4). These findings can be compared with another study done in India where hereditary (23%) and intrauterine factors (2%) were responsible for 25% of severe visually impaired/blind children, prenatal factors for 1%, postnatal factors for 28%. In 46% of severe visually impaired/blind children etiology was unknown. Genetic diseases and other factors operating in the intrauterine period were responsible for 56% of cases of childhood blindness and prenatal factors for 30% of cases in a national survey in the Republic of Ireland in 1991, and similar pattern is seen in reports from other industrialized countries. By contrast, in Africa acquired childhood factors - mainly Vitamin A deficiency and measles - account for more than 50% of cases. The high proportion of postnatal factors contributing to childhood blindness is due to occurrence of ocular trauma in postnatal life in Pakistan.

CONCLUSIONS

The conclusions that I can draw from my study are as follows:

Pediatric Ophthalmic disorders are fairly common accounting for 16.7% of the total ophthalmic admissions. They are more in males than females with a ratio of about 2.5:1.

Consanguinity is positive in high percentage of cases. Disease was unilateral in 65% of patients. Cataract was the most common pediatric ophthalmic disorder. Corneoscleral disorders accounted for 20% of the patients. More than half of the patients were victims of trauma. Surgery was performed in a high percentage of cases. Good prognosis for vision was found in 80% of the patients.

RECOMMENDATIONS

The situation of childhood blindness in Pakistan is alarming. In order to address this problem in a scientific manner, we need to take the following steps:

The WHO/ICEH form should be used to record the prevalence and causes of visual impairment and blindness in children. Urgent health education is required to create awareness about: Importance of breast feeding and proper and timely weaning, Avoidance of X-rays, Nonessential medicine, smoking and alcohol during pregnancy and harmful eye practices, Genetic eye diseases, Improvement in community and personal hygiene, Avoidance of trauma. Immunization should be used against infectious diseases with blinding consequences, i.e. measles and rubella. Early recognition and treatment are important in number of conditions such as conjunctivitis in newborn, xerophthalmia, congenital cataracts, congenital glaucoma and ocular injuries. Pro-gramme to control childhood blindness should be integrated into national prevention of blindness programme. There should be close collaboration between Ophthalmologist, Neonatologist, Pediatrician and Maternal and Child health workers and education services. There should be legislative measures against dangerous toys, dangerous drugs, lead poisoning and seat belts. Epidemiological, operational and health system research is urgently needed in the field of childhood blindness. There is need for
strong professional and political commitment towards ensuring adequate and Comprehensive eye health to all children of Pakistan.

REFERENCES


