STUDY OF AETIOLOGICAL FACTORS CONTRIBUTING TO PAEDIATRIC STRABISMUS

B. Dharmaraju[1], S. Vijayasree[2], K. Mythili[3]

[1]Associate Professor, Department of Ophthalmology, Regional Eye Hospital, Kakatiya Medical College, Warangal.
[2]Assistant Professor, Department of Ophthalmology, Regional Eye Hospital, Kakatiya Medical College, Warangal.
[3]Postgraduate, Department of Ophthalmology, Regional Eye Hospital, Kakatiya Medical College, Warangal.

ABSTRACT

AIMS AND OBJECTIVES

To know various causes, sex distribution, socioeconomic status, onset, severity, visual prognosis of paediatric strabismus.

METHODOLOGY

The present study was undertaken for a period of 18 months. All the patients were selected from those attending the outpatient department. 50 cases of squint were evaluated thoroughly to know the various factors responsible for squint and how it was caused.

RESULTS

Total Number of Patients who attended OPD were 72,431 (4000 per month). Total Number of Paediatric squint cases among them were 121. So, Incidence of Paediatric squint in general OP was-0.16%. In the present study of total 121 paediatric squint cases, 21 cases did not fulfil the inclusion criteria and in the remaining 100, cases were included by taking every 2nd patient. Esotropia is seen in 38 children contributing to 76% of total and exotropia is seen in 12 children contributing 24% of total cases. Most common cause of esotropia is Essential Infantile Esotropia contributing to 31% of total esotropias. Males are affected more commonly than females with an incidence of 60%. Esotropia is seen in 38 children contributing to 76% of total and exotropia is seen in 12 children contributing 24% of total cases. In this study, males are affected more commonly than females contributing to 60% of total and females constitute 40% of the total. In this study, incidence of paediatric squint is more commonly seen in lower socioeconomic population contributing 60% of the total. 15 cases are of congenital in onset constituting 30% of total and 35 cases are of acquired in onset constituting 70% of total. Small angle Esotropia and large angle Esotropia: In this study out of total 38 cases of esotropia, large angle esotropias are more common and contributing to 89% of the total. Out of total 50 cases, 16% had an angle of $<15^0$ and 76% of total had an angle of 15^0-30^0 and 8% of total had an angle of $>30^0$. Out of 50 cases, significant family history was present in 15 cases contributing to 30% of total cases. Following early recognition and prompt treatment, the prognosis is usually good. 58% of cases showed good visual improvement.

CONCLUSION

Parents are naturally worried about the child with squint eyes. So if we know the common aetiological factors, it will be easy for us to counsel the parents towards the prevention and management of this condition.

KEYWORDS

Esotropia, Exotropia, Essential Infantile Esotropia Contributing to Paediatric Strabismus.

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INTRODUCTION: Strabismus is a condition in which the eyes are not properly aligned with each other. Paediatric strabismus is quite a fascinating condition but frustrating sometimes, as it is difficult to examine a child. Parents are naturally upset and worried about the cross-eyed child. Evaluation and treatment of paediatric strabismus is very much challenging. Strabismus is primarily managed by ophthalmologists, optometrists and orthoptists. It is a misalignment of the eyes, is a common childhood ocular disorder that often results in vision loss from amblyopia and impaired binocular depth perception.

In addition to the functional effects of strabismus, there are often aesthetic concerns that can contribute to psychosocial difficulties in terms of self-image.,[1] interpersonal relationships, and social prejudice. Many patients with strabismus undergo surgical correction or lengthy therapy in hopes of having improved ocular alignment and/or attainment of better sensorimotor fusion. Only recently population-based age- and ethnicity-specific prevalence estimates for strabismus have become available for young children in the United States, with overall rates among different ethnic groups ranging from 2.1% to 3.3% in children less than 6 years of age. The aetiology of childhood strabismus is not well understood, but it is likely that both genetic and environmental factors contribute.[2] Treatment should be started as soon as possible to ensure

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Corresponding Author:
Dr. B. Dharmaraju,
Associate Professor, Department of Ophthalmology,
Regional Eye Hospital, Kakatiya Medical College,
Warangal, Telangana.
E-mail: dr.dharmarajub@gmail.com
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the best possible visual acuity. The present study was undertaken at Regional Eye Hospital, Warangal for a period of one and half years during March 2012 to September 2013.

MATERIALS AND METHODS: The present study was undertaken at Regional Eye Hospital, Warangal for a period of one and half years from March 2012 to September 2013. Total Number of Patients who attended OPD were 72,431 (4000 per month). 50 cases of squint were evaluated thoroughly to know the various factors responsible for squint and how it is caused. All the 50 cases of manifested squint were selected with following criteria.

Inclusion Criteria: The patients selected were below 14 years of age including males and females.

Exclusion Criteria: Children above the age of 14 years, traumatic causes, and children less than 6 months were excluded.

Detailed History Taking: It included who first noticed the squint, abnormality that was first noticed, age of the patient when it was noticed, mode of onset, whether it was intermittent or constant in nature, any significant antenatal, natal and postnatal history, any family history, associated with any ocular symptoms and any prior treatment given.

Visual Acuity Test: Both distant and near vision should be tested separately. Each eye should be tested separately.

Local Examination: It includes head posture, facial symmetry, position of eyeballs, visual axis and also rule out pseudo strabismus.

RESULTS: According to Hospital Data: Incidence of Paediatric Squint among all patients who attended the general OPD at Regional Eye Hospital, Warangal during the period between March 2012 to September 2013 was; Total Number of Patients who attended OPD were 72,431 (4000 per month). Total Number of Paediatric squint cases among them were 121. So, Incidence of Paediatric squint in general OP was-0.16%. In the present study of total 121 paediatric squint cases, 21 cases did not fulfil the inclusion criteria, in the remaining 100 cases by taking every 2nd patient into consideration, a group of 50 patients were studied. Esotropia is seen in 38 children contributing to 76% of total and exotropia is seen in 12 children contributing 24% of total cases. Most common cause of esotropia is Essential Infantile Esotropia contributing to 31% of total esotropias. Most common cause of exotropia is Alternate Exotropia contributing to 42% of total exotropias. Males are affected more commonly than females with an incidence of 60%.

Type of Squint	No. of Patients	Percentage
Esotropia	38	76%
Exotropia	12	24%
Type of Esotropia		
Comitant	28	56%
Incomitant	10	20%
Type of Exotropia		
Comitant	11	22%
Incomitant	1	2%
Aetiology of Esotropia		
Essential Infantile	12	24%
Accommodative Refractive	11	22%
Sensory Deprivation	5	10%
Sixth cranial N. Palsy	8	16%
Duane's Retraction Syndrome	2	4%

Table 1: Shows Types of Paediatric Squint Seen in this Study

Out of total 50 cases, Esotropia is seen in 38 children contributing to 76% of total and exotropia is seen in 12 children contributing to 24% of total cases. In this study among Esotropias, Comitant esotropias are more common than Incomitant and constitute 76% of total and Incomitant esotropias constitute 24% of all esotropias.

Aetiology of Exotropia	No. of Patients	Percentage
Alternate exotropia	5	42%
Intermittent exotropia basic type	3	25%
Sensory deprivation	3	25%
Third cranial nerve palsy	1	8%
Sex		
Males	30	60%
Females	20	40%
Socioeconomic status		
Upper	5	10%
Middle	15	30%
Lower	30	60%
Onset		
Congenital	15	30%
Acquired	35	70%

Table 2: Demographic Details of Exotropia

Table 2 shows out of all Exotropias, alternate exotropias are seen most commonly constituting 42% of total and intermittent basic type constituting 25% of all exotropias. In this study, males are affected more commonly than females i.e. 60% of total, and females constitute 40% of the total. In this study, incidence of paediatric squint is more commonly seen in lower socioeconomic population at 60% of the total. Out of 50 cases, 15 cases are of congenital in onset constituting 30% of total and 35 cases are of acquired in onset constituting 70% of total.

Types of Esotropia	No. of Patients	Percentage
Microtropia (1-5°)	0	0%
Small angle esotropia (5-12°)	4	11%
Large angle	34	89%
Esotropia (>12°)	0	0
Angle of squint		
<15°	8	16%
15-30°	38	76%
>30°	4	8%
Family History		
Present	15	30%
Absent	35	70%
Visual Prognosis		
Good	29	58%
Poor	21	42%

Table 3: Types of Esotropia based on Angle of Deviation, Angle of Squint

Table 3 shows that based on degree of deviation, Lange classified esotropias into Microtropia, Small angle Esotropia and large angle Esotropia. In this study out of total 38 cases of esotropia, large angle esotropias are more common and at 89% of the total. Out of total 50 cases, 16% had an angle of $<15^0$ and 76% of total had an angle of 15^0-30^0 and 8% of total had an angle of $>30^0$. Out of 50 cases, significant family history was present in 15 cases which is 30% of total cases. Early recognition and prompt treatment usually leads to good prognosis. 58% of cases showed good visual improvement.

DISCUSSION: According to hospital data, incidence of paediatric squint in general OP patients was 0.16%. In this study out of total 50 cases, esodeviations were seen most commonly contributing 76% (38 cases) than exodeviations which contribute to 24% (12 cases) which is more or less equal to studies conducted by Sofia Iqbal et al.[3] which showed 76.7% esodeviations and 19.5% exodeviations. This compared favourably with Shaikh and Aziz's study.[4] in Pakistan which showed esodeviations in 86.2% and exodeviation in 13.7%. This is in contrast to studies in Cameroon.[5] which showed Exodeviation in 62.8% and esodeviation in 37.2%. Studies conducted by Friedmann and co-workers.[6] showed 72% were esotropias and 23% were exotropias. Ratio of 1:3 prevalence of exo and eso has also been established in surveys from Scandinavia.,[7] Great Britain, Western Canada.[8] and United States.[9] In the present study, most common cause of esotropia was Essential infantile type, which contributes to 31% (12 cases), whereas Accommodative refractive (hypermetropia) contribute to 30% (11 cases). This is in contrast to studies conducted by Sofia Iqbal et al.[3] which showed hypermetropia was the most common cause accounting for 42% of all esotropia cases. In this study, Accommodative refractive esotropias contribute to 30% (11 cases) of all esotropia cases.

This compared favourably with studies conducted by Greenberg AE et al.[10] which showed 36% of all cases. In the present study, paralytic esotropias contribute to 21% of all esotropias. This is in contrast to studies conducted by Greenberg AE et al which showed 6.5% of all esotropias. In this study, out of total 50 cases, Incidence of male cases were 60% (30 cases), female cases were 40% (20 cases). It is more or less equal to studies conducted by Mir Ali Shah et al.[11] which showed 54% cases were males and 46% were females. According to this study, positive family history was present in 30% (15 cases) and family history was not seen in 70% (35 cases) which is more or less equal to studies conducted by Sofia Iqbal et al.[3] which showed positive family history was seen in 30.8% and 69.2% has negative family history. In this study, Accommodative Refractive Esotropia constitutes 22% of total 50 cases which is more or less equal to studies conducted in Minnesota by Mohney BG which showed 27.9%. According to present study out of total 50 cases, Intermittent Exotropia contributes to 6% which is in contrast to studies conducted by Mohney BG in USA which showed 16.9%.

Shreya M Shah et al.[12] they conducted a retrospective cohort study, investigated a consecutive series of paediatric patients with congenital, developing or traumatic cataracts who underwent surgery between January 1999 and April 2012 at our centre. Patient demographics, cataract type, presenting symptoms, surgical intervention, postoperative visual acuity and followup refractive changes were recorded. The results were that in total, 1331 eyes of 1043 children were included, unilateral cataracts were present in 785 (59%) eyes, there were 605 (45.5%) traumatic and 726 (54.5%) non-traumatic cases. Ages at surgery ranged from 1 to 215 months. All eyes were examined for ocular alignment; 66 (5%) were found to manifest strabismus. Deviation was significantly associated with age at intervention ($p<0.001$), sensory nystagmus ($p<0.001$) and aetiology of cataracts ($p<0.001$). They found that significant differences in visual outcomes following amblyopia therapy ($p<0.001$).

They concluded that surgical treatment with intraocular lens implantation in children with congenital, developmental, or traumatic cataracts is effective for visual rehabilitation. Orthoptic treatment made a significant difference in visual outcome ($p<0.001$). Dr Kipa Tubing et al.[13] conducted a descriptive cross sectional study in outpatient Ophthalmology Department at Regional Institute of Medical Sciences (RIMS), Imphal, Manipur for a period of two years from September 2010 to July 2012. The methods followed were complete ophthalmological, orthoptic and squint workup were done for 72 strabismus diagnosed cases from outpatient Ophthalmology Department in RIMS Hospital. The results were that the overall prevalence of strabismus was found to be 2.31% per thousand population with a higher prevalence of exotropia (58.33%) as compared to esotropia (41.67%). All the patients with strabismus had associated refractive error of varying degrees, most common being hypermetropia (33.3%), followed by myopia (22.92%), myopia-astigmatism (22.92%) and hyperopic astigmatism (20.83%).

Thus, the study showed divergent type of strabismus is more prevalent in monogloids (ethnic Manipuris), with hypermetropia being more commonly associated with convergent strabismus and myopia with divergent strabismus.

CONCLUSION: Strabismus is misalignment of visual axes of two eyes. Parents are naturally worried about the child with squint eyes. So if we know the common aetiological factors it is easy for us to counsel the parents towards the prevention and management of this condition. Out of 50 cases studied, the incidence of paediatric squint was 0.16% and it is more in males compared to females. Esotropias are more than exotropias. Essential infantile esotropia is the most common cause of all esotropias and alternate exotropia is the most common of all exotropias in this study. It is more commonly seen in people belonging to lower socioeconomic strata. Acquired onset is more common. Among esotropias, large angle esotropias are seen more commonly than small angle esotropias. Following proper diagnosis and early treatment, good visual outcomes were observed in 58% of total cases.

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