International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Prevalance of Strabismus in Children Attending Ophthalmology Out Patient Department in Saveetha Medical College and Hospital

R. Lakshmi Bharathi[1], Dr. Durga Devi[2]

[1]Principle Investigator, MBBS Third Year, SMCH, India

[2]Professor, Department of Ophthalmology, Saveetha Medical College and Hospital, India

Abstract: ***Background: Strabismus is a clinical condition where the visual axis of the two eyes does not meet at the point or object of regard under normal conditions. The aim of the study is to find the prevalence of strabismus in children between 3-16 years of age attending the ophthalmology OPD in Saveetha Medical College. Methodology: This was a prospective study conducted from January 2019 to march2019 at Saveetha Medical College and Hospital. All children between the age group of 3-16 were included in the study. Children aging below 3andchildren agingabove16 were excluded in the study. Detailed history regarding birth, development, family and complaints were taken. Ocular movements, head posture, binocular functions, measurement of convergence and accommodation were tested. Strabismus was evaluated through prism bar test . The anterior chamber was examined through slit lamp evaluation. Results: A total of 500 patients were included in the study. Among them total number of children with strabismus was 8.Thus the prevalence of strabismus is 1.6%. Prevalence of strabismus among children of 3-10 years was 75% whereas prevalence among 11-16 years was 25%.Prevalence of strabismus among girls was 62.5% whereas prevalence among boys was 37.5%. Conclusion: The prevalence of strabismus was 1.6% in a study population of 500. Prevalence among children of 3-10 years was higher than that of 10-16 years children. Prevalence among girls was more than that of boys. This study indicates that screening of strabismus among children could be useful in detection of asymptomatic cases, early detection of strabismus, appropriate prevention, medical and surgical treatment of strabismus.***

Keywords: Strabismus, slit lamp examination, prism bar test ,binocular vision

1. Introduction

Strabismus is an abnormal alignment of the two eyes in which one of the eyes is deviated in or out or up or down. In simple terms strabismus is the condition where the visual axes of the two eyes do not meet at the point or object of regard [1]. This is a condition when one eye deviates away from the fixation point(Duke-Elder) under normal conditions. The most common causes of strabismus include: congenital, present from birth, hereditary, or running in families, suggesting a genetic link, Duane syndrome[2], Moebius syndrome[2],increased requirement for accommodation and convergence as in hypermetropia results in esophoria, decreased requirement for accommodation and convergence as in myopia results in exophoria, inappropriate development of the "fusion center" of the brain ,problems with the controlled center of the brain ,injuries to muscles or nerves or other problems involving the muscles or nerves, prenatal drug abuse, low birth weight, common among children with disorders that may affect the brain, such as: cerebral palsy; Down syndrome; hydrocephalus; brain tumors; prematurity[2].The prevalence of convergent squint varies in different parts of the world. The prevalence of strabismus varies from different epidemiological regions ranging from 0.5%-5% according to studies[3] . However, esotropia is the most common form of strabismus constituting from a half to two thirds of all misaligned eyes.The prevalence of strabismus also differs between various races and the prevalence of different types of strabismus also varies according to race. The effect of strabismus is not only clinically , the patient also suffers psychological, emotional, social consequences which includes prejudiced against strabismic individuals, often misunderstood for their intelligent quotient, negative social bias, depression ,anger, anxiety, poor interpersonal relationship, and stereotyping them.Early detection and prevention is therefore important for correction of the refractory error and establishment of single binocular vision.

2. Methodology

This was a prospective cross-sectional study conducted from January 2019 to march 2019 at ophthalmology outpatient department in Saveetha Medical College and Hospital. A total of 500 cases were included in the study. Informed and written consent was obtained from all the study subjects. The study included children from the age group of 3-16 years. Children below 3 years and above 16 years were excluded in the study. The patient's detailed case history regarding chief complaints, onset and duration, previous treatment and family history was taken. Visual acuity, cycloplegic refraction, ocular movements, head posture fundus examination, binocular functions, measurement of convergence, accommodation, and monocular fixation pattern were tested[4]. Strabismus was identified and estimated by prism bar test[4].Appropriate clinical investigation and tests were done when necessary.

3. Results

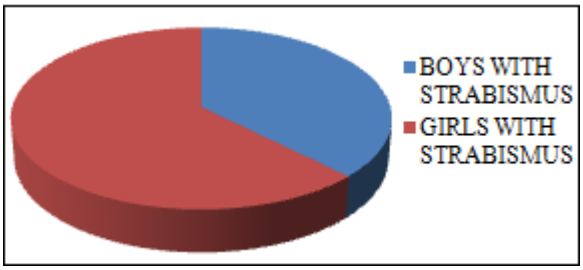
A total of 500 children were included in the study. Of total of 500 children 316(63.2%) of them were girls and 184(36.8%) were boys. The participation of children among the age group of 11-16 years is higher than that of the age group of 3-10 years. There were 222(44.4%) children in the

age group of 3-10 years and 278(55.6%) children in the age group of 11-16years. Among them there were 8 strabismic patients. Thus the prevalence of strabismus in this study is 0.6%.the prevalence among the 3-10 years was higher than the 11-16 years. There were 6 strabismic cases in 3-10 years and 2 cases in 11-16 years. In this study there was increased prevalence among girls than boys. Prevalence among boys and girls were 0.6% and 1% respectively.

Table 1: Gender distribution of the study

Gender	Boys	Girls
Total in number	184 (36.8%)	316 (63.2%)
Strabismic involvement in number	3 (0.6%)	5 (1%)

Gender distribution among strabismus

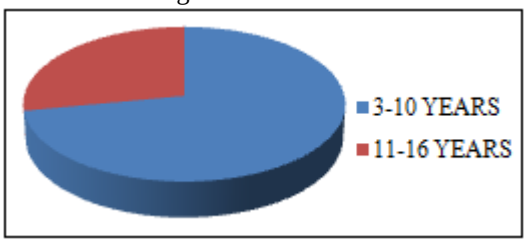


Participation among the girls was higher than the boys which can explain the increased strabismic prevalence among girls. Prevalence among boys and girls were 0.6% and 1% respectively.

Table 2: Age distribution of the study

Age	3-10 years	11-16 years
Total in number	222 (44.4%)	278 (55.6%)
Strabismic involvement in number	6 (1.2%)	2 (0.4%)

Age distribution among strabismus



There was an equal participation among 3-10 years and 11-16 years whereas the prevalence of strabismus among 3-10 years was higher than that of 11-16 years. The prevalence of strabismus among 3-10 years and 10-11 years were 6 (1.2%) and 2 (0.4%) respectively.

4. Discussion

The prevalence of strabismus in this study was 1.6%. This is comparable with 0.6% prevalence of squint in a study by Tarakarameshwara Rao et al conducted in Vishakapatnam[5] and another study in South India by Kalikivayi V et al had prevalence of 0.7%[6]. The prevalence of strabismus in the study done by Gupta M et al in North India was 2.5%[7].

Table 3: Prevalence among different study.[5]

Study	Boys	Girls
Current study	37.5%	62.5%
Tarakarameshwara Rao et al[5]	50.8%	49.15%
Kalikivayi et al[6]	45.85%	54.15%
Graham et al[7]	Prevalence 7.3%	Prevalence 6.9%
CBO Yu et al[8]	46.8%	53.2%
Adelstein A.M et[9]	52.3%	47.7%
Cass EE[13]	30%	70%

The comparison of gender distribution in other studies is shown in the above table. In studies by Graham PA, Adelstein AM et al and also in the current study there is slight male preponderance but this difference was not statistically significant. While Kalikivayi et al, CBO Yu et al and Cass EE reported a female preponderance.

On the whole strabismus was more common in 3-10 years age group (prevalence of 1.2%) when compared to children in 11-16 (0.4%) year's age group prevalence. This difference is statistically significant. But this could also be because the current study is an institution based study. Several young children who might not have developed vision loss and so haven't yet consulted an ophthalmologist. These children were likely missed in the current study.

Table 4: Region wise prevalence comparison

Study	Region	Prevalence
Current Study	Chennai	1.6%
Tarakarameshwara et al[5]	South India	0.65%
Kalikivayi V et al[6]	South India	0.7%
Gupta M et al[7]	North India	2.5%
Graham et al[8]	England	7.1%
Adelstein et al[9]		4.3%
Rantanen et aal[10]	Finland	4.6%
Ayanru et al[11]	Nigeria	1.9%
Matsuo et al[12]	Japan	1.28%

A large variation in this prevalence is found throughout the world.The variation in prevalence is found in different areas of the same country, such as that found in reports from Australia. They found that the prevalence of strabismus in children of 6 years of age in the Sydney Myopia Study was 1.8% (for children without eyestrain symptoms) and 7.3% (for children with eyestrain symptoms), but was as low as 0.3% in another study of children 3 to 12 years in Victoria and New South Wales. In addition, these variations were found in Nigeria where it was 0.4% in the South, 1.9% in the North, and 0.06% in the East, which could be due to racial causes.

According to Remaly NA et al risk of strabismus increased with low birth weight. Maternal cigarette smoking during pregnancy also increased the risk of each type of strabismus.Cass EE stated that a family history of squint was present in only 28% of the cases. In study by Graham PA, 8.1% of children in control group had a family history of squint, while 19% of children with squint had a positive family history.Studies by Rachael H et al have shown that intensity and duration of exposure to sunlight may play a role in pattern distribution of strabismus along with racial factors. Thus, higher the intensity of light, higher the frequency of exotropia.

5. Limitations

The strengths of the study included a large and multicultural study sample, which initially provided sufficient statistical data in detecting the prevalence of strabismus. The major limitation was that the study design was hospital-based rather than population-based which explains the short list of study population. Although the hospital visiting patient count increased in rural South India has been rapidly increased in recent years, some parents still could not identify the disease and are unable to afford the expenses. Thus, being unable to include these children in the study might have distorted the prevalence estimates. In addition, the diagnostic criterion for strabismus in this study might have underestimated the prevalence, especially among children with older age.

Strabismus should not be ignored or watched on the assumption that it will be outgrown. Permanent vision loss can occur if amblyopia occurs and is not treated before age 4 to 6 years. Children treated at a later age can improve with treatment, but once the visual system has matured (typically by age 8), response to treatment is minimal. As a result, all children should have formal vision screening in the preschool years.Success rates with surgical repair of strabismus can be greater than 80%.

6. Conclusion

Prevalence of squint in children in 3 - 16 years age group was 1.6%. There was an increased prevalence among girls among 3-10 years. Appropriate ante natal checkups, early diagnosis and appropriate management can greatly reduce the disease burden due to ante-natal cause. There should annual checkup of all children to prevent strabismus. Specifically, those found to have any visual morbidity should be examined more often to prevent progression. Prevalence of amblyopia in strabismic patient was found to be 0.09%. Regular school based / community based screening of children is necessary for early diagnosis of strabismus in children. An option that can be looked into for this purpose is a comprehensive health examination including complete eye check up at the time of enrolment in primary school.Extensive health education campaign among children as well as their parents is needed to alleviate superstitious beliefs.

References

[1] Sihota R, Tandon R. Parsons Diseases of the eye. 20th Edition. 2011.
[2] Strabismus (Squint; Cross-Eye; Wandering Eye) By Christopher M. Fecarotta, MD, Phoenix Children's Hospital;
[3] What's new for us in strabismus?Pradeep Sharma, Pediatric Ophthalmology and Strabismus Services, Dr. Rajendra Prasad Centre for Ophthalmic Sciences.
[4] SihotaR,TandonR.ParsonsDiseasesoftheeye.21thEdition .2011.
[5] Strabismus in pediatric age (3-16), a clinical study by Tarakarameshwara Rao department of ophthalmology, vishakapatnam.
[6] Kalikivayi V, Naduvilath TJ, Bansal AK, Dandona L. Visual impairment in school children in Southern India. Indian J Ophthalmol. 1997;45.
[7] Gupta M, Gupta BP, Chauhan A, Bhardwaj A. Ocular morbidity prevalence among school children in Shimla, Himachal, North India. Indian J Ophthalmol. 2009;57:133-8.
[8] Graham PA. Epidemiology of Strabismus. Brit J Ophthalmol. 1974;58(3):224-31.
[9] Adelstein AM, Scully J. Epidemiological aspects of squints. Br Med J. 1967;3(5561):334.
[10] Rutstein RP, Daum KM. Anomalies of binocular vision: diagnosis andmanagement. St. Louis: CV Mosby, 1998:192-5
[11] Ayanru JO. Environment, Culture and eye disease in Nigeria (experiences at Benin City, Bendel state of Nigeria). In: Proceedings of "The African Eye, Kenya, Nairobi. 1982:41-46.
[12] Matsuo T, Matsuo C. The prevalence of strabismus and amblyopia in Japanese elementary school children. Ophthalmic Epidemiol. 2005;12(1):31-6.
[13] Cass EE. Divergent strabismus. Br J Ophthalmol. 1937;21(10):538-559.