

## Prevalence of Types of Strabismus in Pediatric Patients In A Tertiary Centre of North India.

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### Abstract

**Objective:** To find out the prevalence of different types of strabismus in pediatric population in a tertiary care hospital.

**Study Design:** A retrospective cross sectional study conducted in pediatric ophthalmology and strabismus clinic of Institute of Ophthalmology JNMCH, AMU for a period of one year.

**Method:** Complete ophthalmological and orthoptic workup was done for 148 pediatric patients having strabismus.

**Results:** The average age of all patients was 7.90 years (females 7.65 years and males 8.13 years). Among 148 cases with strabismus there were 70 (47%) females and 78 (53%) males, 81 cases (55%) had esotropia, 56 cases (38%) had exotropia, 3 cases (2%) had restrictive strabismus, and 8 (0.05%) had paralytic strabismus.

**Conclusion:** Esotropia is the most common type of strabismus in pediatric population followed by exotropia, paralytic and restrictive type being the least common.

**Keywords:** Strabismus, esotropia, exotropia, paralytic strabismus, restrictive strabismus

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### I. Introduction

Strabismus is a common presenting ocular problem at ophthalmology outpatient clinics. Many studies were conducted in the field of strabismus including those talking about the prevalence of strabismus and its types. Abeba Tekle Giorgis and Abebe Bejiga conducted a study on preschool children in Butajira town in Ethiopia. [1] They found that esotropia (69%) as the commonest type of strabismus followed by exotropia (24%). Strabismus consists of a medical, social and psychological problem. Strabismus can be both cause or effect of poor binocularity and when it appears in early life results in sensorial adaptations as anomalous retinal correspondence and amblyopia. On the other hand if strabismus arises after binocular vision development, diplopia and image confusion appears which persist indefinitely or until motor alteration is corrected. Treatment of strabismus should be initiated as early as possible to achieve binocularity, improved visual outcome and reduce psychosocial stigma associated with strabismus.

This study was carried out in Pediatric ophthalmology and strabismus clinic of Institute of Ophthalmology, JNMCH, AMU. Pediatric patients with any type of strabismus attending the clinic in the period from January 2016 to December 2016 were included in the study. This study presents the relative prevalence of various types of strabismus by gender and average age of presentation.

### II. Materials And Methods

A retrospective cross sectional study was conducted among patients attending Pediatric ophthalmology and strabismus clinic of Institute of Ophthalmology, JNMCH, AMU. A total of 148 strabismus patients ageing between zero and 16 years were included in the study. Data was collected between Jan 2016 to Dec 2016. Each patient underwent complete ophthalmological and orthoptic work-up including visual acuity test by Cardiff acuity cards, Snellen's chart or log MAR visual acuity chart, refraction with cycloplegia, stereo acuity tests, diplopia charting for noncomitant squint, forced duction test to rule out paralytic/ restrictive component, Hirschberg's test, Krimsky's prism reflex test, Cover test, Cover-Uncover test and Prism Bar Cover Test (PBCT) to measure degree of deviation and strabismus evaluation at distance and near without and with glasses (if he/she wears glasses). Every patient was categorized into one of four groups of strabismus: esotropia, exotropia, paralytic and restrictive strabismus. We used "epitools" for calculation of prevalence. Agresti – coull method of calculation (also known as Modified Wald method) of confidence interval was used for proportions.

**III. Results**

The average age of all patients was 7.90 ±4.35years (95% C.I, 7.19-8.60) and ranged from eight months to 16 years. The average age of females was 7.65 ±3.97 years (95% C.I, 6.70-8.60) and males 8.13± 4.67 years (95% C.I, 7.08-9.18) ( Table 1). Among 148 cases with strabismus there were 70 (47%) females (95% C.I, 0.39-0.55 ; ) and 78 (53%) males (95% C.I, 0.45-0.61 ; ), 81 cases(55%) had esotropia(95% C.I, 46.69-62.53 ; ), 56 cases (38%) had exotropia (95% C.I, 30.42- 45.87 ; ) and the difference between esotropia and exotropia was statistically significant (p< 0.05).3 cases (2%) had restrictive strabismus (95% C.I, 0.42-6.06 ; ), and 8 (0.05%) had paralytic strabismus (95% C.I, 2.60-10.46 ;).( Table.2).

**Table 1.** Mean age distribution on basis of gender.

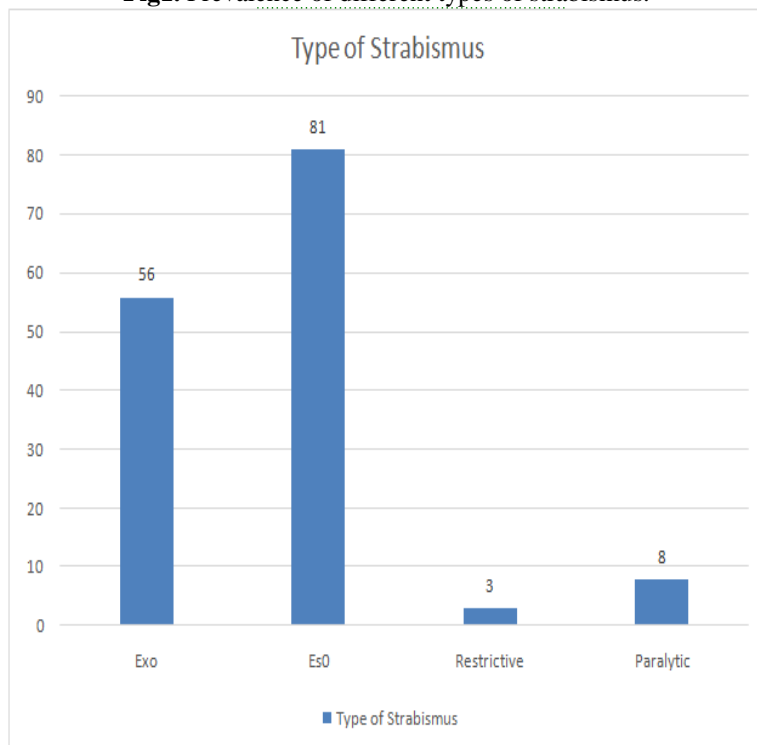
95% C.I	S.D	Mean (years)	Gender
6.70 – 8.60	3.97	7.65	Female
7.08 – 9.18	4.67	8.13	Male
7.19 – 8.60	4.35	7.90	Total

**Table 2.** The relative prevalence of various types of strabismus to the total number of strabismus cases

Gender									Type of strabismus
Total			Male			Female			
95% C.I	%	N	95% C.I	%	N	95% C.I	%	N	
46.69-62.53	54.7	81	45.36-66.86	56.4	4	41.32-64.10	52.8	37	Esotropia
30.42-45.87	37.8	56	27.28-48.29	37.1	2	28.03-50.30	38.5	27	Exotropia
0.42-6.06	2.03	3	-0.93-0.06	0	0	0.98-12.35	4.29	3	Restrictive strabismus
2.60-10.46	5.41	8	2.43-14.48	6.41	5	0.98-12.35	4.29	3	Paralytic strabismus
		148			78			70	Total

From table 2 and Fig.1, the most prevalent type of strabismus isotropia, exotropia comes second followed by paralytic and restrictive strabismus respectively. This sequence keeps true regardless of gender.

**Fig1.** Prevalence of different types of strabismus.



**Fig 2.** Prevalence of different types of strabismus on the basis of gender.

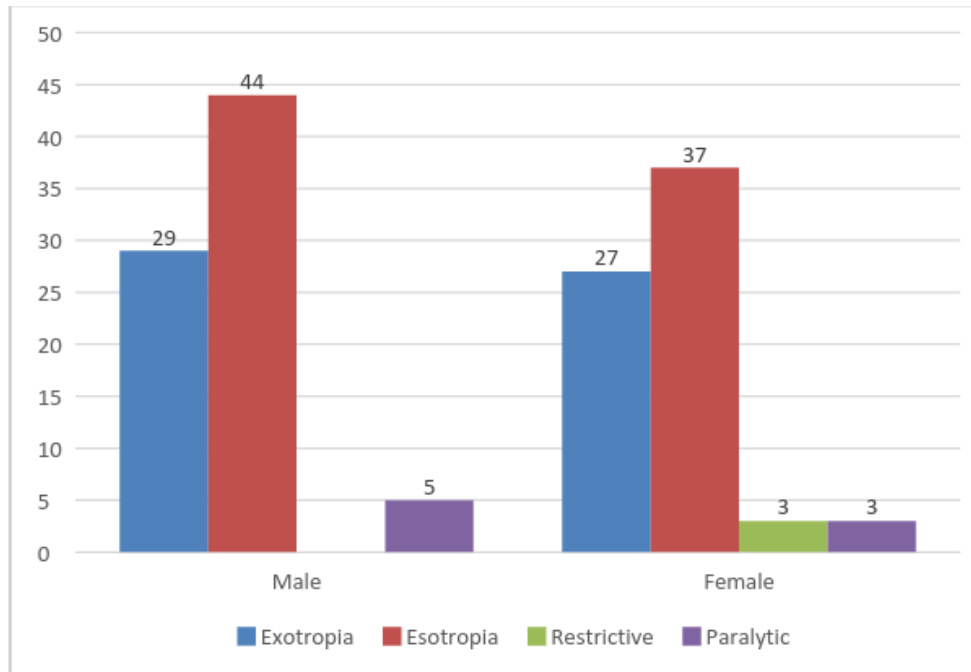
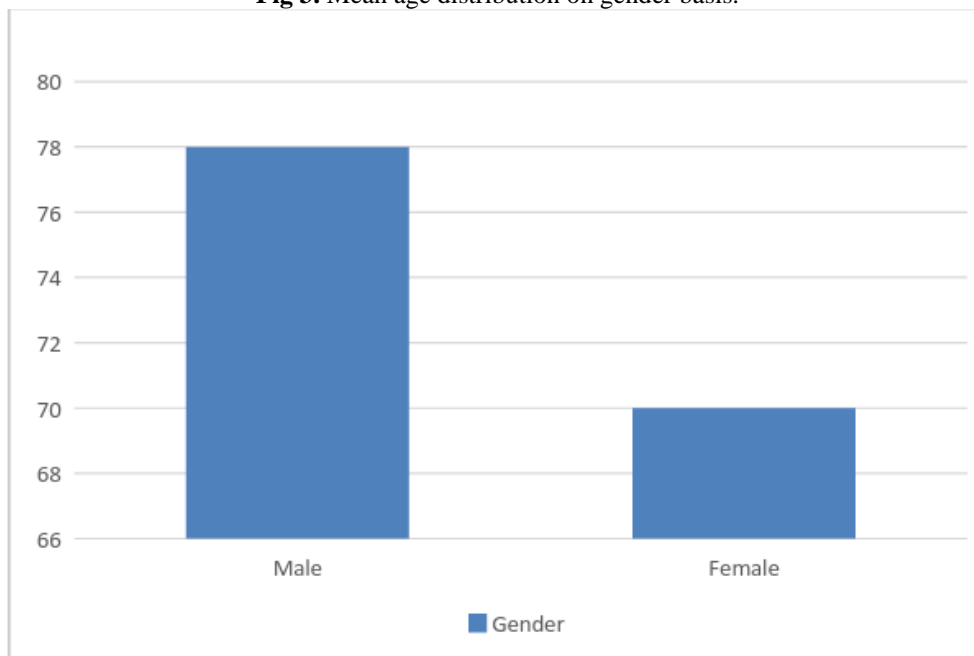


Fig 3. Mean age distribution on gender basis.



#### IV. Discussion

In our study, esotropia was more common than exotropia. This was similar to the findings of various studies done elsewhere. In a study done in 768 children aged between five and fourteen years by Taha and Ibram in Khartoum city, Sudan, esotropia constituted 81.82% cases and exotropia 18.81% cases. [2]. In Nigeria, Azonobi et al screened a total of 7,288 children of age ranging from two to sixteen years. Total 32 cases of strabismus were found, esotropia cases having higher prevalence of 68.75% as compared to exotropia with prevalence of 31.25%. [3] According to study by Abebe in Ethiopia done in 361 patients, esotropia and exotropia constituted 78.7% and 20.8% of cases respectively. [4] Similarly in a series of 275 patients in Ireland (UK), Mvogo et al found esotropia five times more common than exotropia. [5] In a study done in 291 patients under 14 years of age, Medghalchi found that 76 % cases had esotropia and 24% had exotropia. [6] In another study of 100 patients (up to 12 years of age) with concomitant strabismus in Kolkata, by Datta D found that esotropia (74%) was more common than exotropia (26%). [7] According to Duane, strabismus distribution is from 2 to 4 % for esotropia and from 0.5 to 1 % for exotropia. [8] In a hospital based study done in Riyadh,

Saudi Arabia, records of 4,886 strabismus patients were analysed. In this, esotropia was the most common type of strabismus (69.3%), while exotropia was less common (26.9%). [9] In our study, incomitant type of strabismus “paralytic and restrictive types” were less frequently seen and they constituted 7.4% of all cases, so they are not common types. This is similar to a study by Abuimara done in Gaza in 226 patients where these two groups together consisted 14.1% of all cases. [10]

The mean age of presentation of females was lower than that of males in our study, though the difference was not statistically significant. The prime target of any strabismus management is to provide good binocular vision and long lasting ocular alignment. Delay in reporting and treatment intervention are detrimental to correction of vision and final alignment.

## V. Conclusion

Esotropia is the most common type of strabismus in pediatric population followed by exotropia, paralytic and restrictive type being the least common. Early detection of strabismus, treatment of amblyopia and correction of ocular alignment helps achieve binocularity on a long term basis. It serves as a boon in reducing economic and social burden for a developing nation.

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