

Frequency of Major Types of Manifest Strabismus among Patients of Age Group 1 to 25 Years Presented to Benazir Bhutto Hospital Rawalpindi

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Abstract: Aim: To find out the occurrence of different types of manifest strabismus in patients among the age group of (1-25 years) attending ophthalmology out-patient department at Benazir Bhutto Hospital Rawalpindi. **Study Design:** This was a cross-sectional study conducted within the time period of four months (Sep 2015 to Dec 2015). **Methods:** By using Consecutive sampling technique a total of 150 strabismus patients were examined. Detailed evaluation of strabismus was carried out which included Visual Acuity measurement with Snellen chart and Lea symbols or assessed qualitatively through light fixation and follow; and by performing Cover tests and Krimsky test. All the tests were carried out with and without glasses, and at near and distance both. Cycloplegic refraction was done on children, by dilating them with 1% cyclopentolate eyedrops. Data was recorded on a performa. **Results:** Overall occurrence of manifest strabismus was found to be 3.9%, with much greater frequency of Comitant type. 48.48% had ET out of which 51.56% was Accommodative ET, followed by 42.19% Constant ET & 6.25% Infantile ET. 51.51% had XT out of which 69.12% was Constant XT followed by 30.88% Intermittent XT. No pure vertical deviations were seen but 11.33% patients had co-existing vertical deviations with horizontal deviations. **Conclusion:** Comitant strabismus is more occurring than incomitant, with ET and XT having almost same proportion. Mostly occurring types are Accommodative ET, Constant ET, Constant XT and Intermittent XT. Amblyopia and refractive errors are often associated with it.

Key Words: Strabismus, Comitant, Incomitant, Esotropia, Exotropia, Amblyopia.

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INTRODUCTION

Strabismus, also called squint, tropia and heterotropia, is a common ocular disorder having a 1% to 4% of prevalence [1,2]. There are two types of strabismus: concomitant and incomitant. Concomitant strabismus is a condition in which the ocular angle of deviation remains constant in each direction of gaze. It includes the most common types of strabismus, including exotropia, esotropia, hypertropia, monofixation syndrome and microstrabismus. In the incomitant strabismus, which is also called as complex or paralytic strabismus, the misalignment of eyes or the angle of deviation differs with each direction of gaze. It accounts for approximately 5% of strabismus cases and comprise of different forms of Duane retraction syndrome (DRS), congenital fibrosis of the extraocular muscles (CFEOM) and horizontal gaze palsy [3]. Horizontal comitant type is the most common form of strabismus [4-8]. Strabismus can be defined as a manifest deviation of the primary lines of sight of 1 prism diopter (PD) or more. In strabismus, when the patient tries to fixate an object, one eye is either constantly or intermittently not aligned toward the same point as the other eye. Therefore, the image of the targeted object does not form on the fovea of the deviated eye. The inward convergent misalignment of one eye is called Esotropia. An outward divergent misalignment is called Exotropia. An upward misalignment is called Hypertropia. A downward misalignment is called Hypotropia. Whereas, a wheel-

like misalignment that is top inward is called Incyclotorsion, while a wheel-like misalignment that is top outward is called Excyclotorsion [9].

This study was conducted to find out the occurrence of different types of manifest strabismus in patients among the age group of (1-25 years) attending ophthalmology out-patient department at Benazir Bhutto hospital Rawalpindi.

MATERIALS AND METHODS

It was a Descriptive Cross-Sectional study which started on 1st September 2015 and continued till 31st December 2015. Patients were referred to the orthoptist clinic from OPD after proper slit-lamp examination to rule-out any anterior or posterior segment pathology. After taking history of the patients, their VA was recorded for each eye separately. It was assessed verbally by the Snellen chart in adults and by the Lea Symbols in children. Visual Acuity was categorized as normal (6/6-6/9), decreased (6/12-6/18), severely decreased (6/24-6/60), <6/60 or wandering eye movements, HM and CF. Cover test was performed to differentiate heterotropia from well compensated heterophoria. Bruckner reflex and Hirschberg reflex was observed by Direct ophthalmoscope for the qualitative assessment of the degree of deviation. For quantitative measurement prisms were used while performing Krimsky and PCT. For infants and when cover tests were not possible due to poor fixation, evaluation was relied upon qualitative

assessment. All these tests were performed at near (40cm) and distance (6m) and without and with glasses (in patients having previous prescription). Children tested at single fixation distance, and who had no strabismus diagnosed with that test were deemed as nonstrabismic [10]. EOM motility was assessed in 9 positions of gaze to see whether there is normal or abnormal pattern. Presence or absence of diplopia; and stereopsis, by using Titmus Fly test was evaluated wherever possible. Automated refraction through autorefractor, cycloplegic refraction in children or accommodative patients by instilling 1% cyclopentolate eye drops, 3 times, by 10 minutes interval and then performing streak retinoscopy; and by performing subjective refraction in adults, refractive error of the patients was evaluated. Any available previous prescription was determined by the Lensmeter. Final refraction was considered as full cycloplegic refraction in accommodative (hyperopic) esotropes and in myopic exotropes. Refractive status of the patients was categorized as Astigmatic, Simple Hypermetropic, Simple Myopic and Emmetropic including physiological hypermetropes and those who had no need of any prescription. Management plan included advising glasses or planning surgery after performing Post Operative Diplopia Test as per required under the supervision of the supervisor.

Data was entered and analyzed using Microsoft Excel 2007. The continuous variable was analyzed as Mean $\pm$ SD and Median, and categorical variable as Frequency.

RESULTS

The results presented in Tables 1, Table 2 and Table 3 shows that the Mean age $\pm$ SD of the patients was 10.5 ± 1.369 . The Median age was found to be 9 years. Occurrence of strabismus was greater in females 80(53.33%) than in males 70(46.67%). The highest frequency of the patients was in the age group of 1-5 years i.e. 31.33%, followed by 6-10 years age group i.e. 24%. 74% of the patients were children (1-15 years). Remaining 26% were adults.

Refractive errors were found in 84(56%) patients. Most prevalent type of refractive error was astigmatism (35.33%), followed by simple hypermetropia (16%) and simple myopia (4.67%). Other 66(44%) were either emmetropic or having physiological hyperopia, not needing any correction.

Overall occurrence of manifest strabismus was found to be 3.9%, with much greater frequency of Comitant type. The occurrence of Incomitant strabismus was found in 18(12%) patients among which 8(44.44%) had Duane Type 1 syndrome, 5(27.78%) had VI (abducens) nerve Palsy, 2(11.11%) had MED & 3(16.57%) was having Brown syndrome.

The occurrence of Comitant strabismus was found in 132(88%) patients with 64(48.48%) having Esotropia, out of which 33(51.56%) had Accommodative ET,

followed by 27(42.19%) with Constant ET & 4(6.25%) having Infantile ET.

Among all the 68(51.51%) comitant Exotropes, 47(69.12%) had Constant XT followed by Intermittent XT in 21(30.88%) patients.

There, no pure Vertical deviations were observed but 17(11.33%) had some degree of vertical deviations co-existing with horizontal deviations.

Overall Amblyopia was observed in 63(42%) strabismic patients with Unilateral Amblyopia in 40(63.49%) & Bilateral Amblyopia in 23(36.51%) patients. Prevalence of amblyopia in ET was higher (74%) than its prevalence in XT (26%).

DISCUSSION:

Strabismus is a common pediatric condition with functional and cosmetic consequences. It is a common cause of amblyopia [11], because most deviations occur in the period of visual immaturity (period of plasticity), so if left untreated, these deviations can lead to development of irreversible amblyopia and postural modifications. Strabismus also results in confusion or diplopia in adults, because of the brain's inability to suppress one image. It leads to loss of binocularity and depth perception (stereopsis). Several reports signify that adults having strabismus are less likely to get jobs compared to those individuals who have normal ocular alignment, which demonstrates that ocular deviations can have noteworthy social impact [12].

Prevalence of strabismus has been estimated through school & clinic based studies [13]. However disparity in disease classifications and study designs could explain some of the variation [14]. The ratio between esotropia and exotropia in Caucasians is 60:40, while, in Asians, this ratio is 33:67. This variation is probably due to anatomical variations between these two races [15]. After conducting a number of community-based studies, the prevalence of esotropia has been accounted to be five times more than exotropia in Ireland and twice in Australia [16,17]. With respect to gender, women comprise 60 to 70 percent of patients with exotropia [18]. In Pakistan, children less than the age of 15 years account for 45% of the whole population [19]. An estimated prevalence of ocular misalignments in Pakistan is 5.4% [19], in US 4% [20], 2.1% among African-American and 3.3% in White children [13]. The difference in this study can probably be attributed to the different age group considered, sampling technique used, specified inclusion & exclusion criteria & the racial differences between Asian & American population.

In this study the overall occurrence of manifest strabismus among 3846 patients attending orthoptics department was found to be 3.9%. In another hospital based descriptive cross sectional study conducted by Durrani YK on 4884 patients visiting eye department Lady Reading Hospital Peshawar, prevalence of comitant esotropia was found as 2.15% [21]. Occurrence

of strabismus was greater in males (54%) than in females (46%). The highest frequency of the patients was in the age group of 7-10 years i.e. 31%, followed by 3-6 years age group i.e. 27%. 78% of the patients were children (3-14 years). Remaining 22% were adults. These results indicate that comitant strabismus is an anomaly of childhood.

A study conducted on incidence of Strabismic Amblyopia in Department of Ophthalmology, Fatima Jinnah Medical College and Sir Ganga Ram Hospital, Lahore finds that the prevalence of amblyopia in ET is higher than in XT [22]. This study also indicates that Amblyopia with ET (74%) is more prevalent than XT (26%) & Unilateral was more frequent than Bilateral Amblyopia.

A major limitation of this study is that it was a hospital-based study which can be biased due to patients of only a specific region. Other limitations include small sample size and short duration of study.

Recommendations: On the basis of results of present study it is recommended that

- The study should be conducted in other hospitals & with relatively large sample size & longer study duration so that the exact prevalence can be estimated.
- There should be organization of awareness programs for the community and general population regarding squint and its treatment potential at all health care levels.

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Table 1: Frequency of Incomitant strabismus.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Duane type 1	8	5.33	44.44	44.44
	6th nerve palsy	5	3.33	27.78	72.22
	Brown syndrome	3	2	16.67	88.89
	MED	2	1.33	11.11	100.0
	Total	18	12	100.0	
Missing	Comitant	132	88		
Total		150	100.0		

Table 2: Frequency of Comitant ET.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Infantile ET	4	2.67	6.25	6.25
	Constant ET	27	18	42.19	48.44
	Accommodative ET	33	22	51.56	100.0
	Total	64	42.67	100.0	
Missing	Missing	86	57.33		
Total		150	100.0		

Table 3: Frequency of Comitant XT.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Intermittent XT	21	14	30.88	30.88
	Constant XT	47	31.33	69.12	100.0
	Total	68	45.33	100.0	
Missing	Missing	82	54.67		
Total		150	100.0		