

Frequency of Types of Squint and Gender Distribution Presenting to a Tertiary Care Hospital in Islamabad

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Abstract:

Objectives: To determine the frequency of various types of squint with gender distribution presenting to a tertiary care hospital in Islamabad.

Methods: This cross sectional study was conducted from 07-01-2021 to 15-03-2022. 57 patients with strabismus were selected for this study. After obtaining consent baseline features including age, gender, and eye involved were documented on the predesigned proforma. The cover-uncover test was performed to determine the type of squint including “exotropia” and “esotropia”. The chi-square test was used as a test of significance.

Results: Among 57 patients 34 (59.65%) were males while 23 (40.35%) were females. The mean age was 21.51 ± 7.22 years. Squint was observed in the left eye only in 9 (15.79%), right eye only in 15 (26.32%), and in both eyes in 33 (57.89%) patients. The frequency of “Exotropia” was 50 (87.72%) while of “Esotropia” was 7 (12.28%). Among male patients (n = 34), “exotropia” was found in 29 (85.29%), and “esotropia” was found in 5 (14.71%) while in female patients (n = 23), “exotropia” was found in 21 (91.30%) and “esotropia” in 2 (8.70%) patients, (p = 0.498).

Conclusion: Exotropia is the more prevalent type of strabismus in our study population with higher frequency in the male population. *Al-Shifa Journal of Ophthalmology 2025; 21(1): 17-22.* © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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Introduction:

Strabismus occurs when the ocular deviation is too great for the fusional process to correct, leading to a misalignment of the eyes in a binocular view. The status of ocular deviation can be either “constant” or “intermittent” depending on the fusional status of the eyes, and the deviation could also be “turned out” or “exotropia”, “turned in” or “esotropia”, “turned up” or “hypertropia”, “turned down” or “hypotropia”, “rotated out” or “excyclotropia” and “rotated in” or “incyclotropia”¹. Amongst all these types “exotropia” has been reported to be the most common type of strabismus². The most prevalent risk factors connected with the development of strabismus are a history of the condition running in the family, a person's ethnic background or racial origin, certain genetic abnormalities, a habit of smoking, premature birth, low weight at birth, a refractive defect and a neural impairment³. “Esotropic strabismus” is strongly linked to farsightedness of $\geq +3$ Diopters and the risk of developing

strabismus rises with both the severity of astigmatism and by spherical equivalent of farsightedness⁴.

Amblyopia from strabismus is a frequent eye condition that threatens the vision of patients. Most strabismic patients also report difficulties with binocular vision and depth perception, with their appearance, with their ability to learn, with their ability to interact socially and with the trauma of recurrent surgical repairs⁵. If strabismus is diagnosed and treated early on, it can have positive effects on patients' visual and socioeconomic well-being⁶. When it comes to restoring eyesight and correcting eye deviation without resorting to surgery, refractive surgery and vision therapy are best possible interventions while in later cases, surgery becomes the mainstay of treatment⁷.

When it comes to frequency of strabismus and its various types, various epidemiological studies have reported variable frequency in different demographics. At one end, it has been found that the frequency of strabismus was quite high in the older adult population while others reported that children had a much higher frequency of having strabismus as compared to the adult population^{8,9}. Similarly, when it comes to gender distribution of squint, studies have reported varying results in younger and elderly population. In younger patients it has been reported that there is no significant gender difference in frequency of strabismus while in older population female patients have higher propensity of having squint^{10,11}. Based on such discrepancies in previous epidemiological studies we aimed to conduct this study in our local population to find out frequency of various types of squint and its gender distribution.

Methodology:

This cross sectional study was conducted at the ophthalmology unit of “FGPC Hospital, Islamabad” from 07-01-2017 to 15-03-2022, after obtaining approval from the ethical review board (ERB) of the

aforementioned institution. In order to calculate appropriate sample size for our study we utilized WHO sample size calculator using formula 1.1 which is for estimation of population proportion with specified absolute precision¹²:

$$n = \frac{z_{1-\alpha/2}^2 P(1-P)}{d^2}$$

To calculate sample size following assumptions were made; confidence level of 95%, absolute precision of 6.3% and anticipated frequency of strabismus as 6.2%¹³. The calculation with these parameters gave a sample size of 57.

For this study, strict inclusion and exclusion criteria were set. Participants who had an age of 6 years or more, were either male or female and had visible squint in one or both of their eyes were included in the study. Patients who had a history of previous ocular or squint surgery were aged less than 6 years and who did not give consent to be a part of this study were excluded from this research.

For selection of patients “non-probability consecutive sampling technique” was used. Once study pool was selected patients were interviewed to ascertain and document their age. Gender and eye(s) involved was also documented in a predesigned proforma as a part of documentation of baseline demographic characteristics. After that, to determine the type of squint “cover-uncover test” was used¹⁴. During this test, patients were first instructed to look at a distinct object placed right in front of them to determine which eye was deviated either nasally or temporally. Once determined, un-deviated eye was covered to see the movement of deviated eye. In case the previously temporally deviated un-covered eye moved nasally upon covering of opposite eye, patient was labelled to have “exotropia” while in case the previously nasally deviated un-covered eye moved temporally upon covering of opposite eye, patient was labelled to have “esotropia”. Similar test was performed on the opposite eye to assess for “simple” or “alternating”

type of the squint. In case deviation was limited to one eye, squint was labelled as “simple”, if it occurred in both eyes, squint was labelled as “alternating”.

To analyze the data, Statistical Package for Social Sciences (SPSS) software version 21:00 was used. To represent quantitative data (age) we used mean +/- standard deviation. For representation of qualitative data (gender, type of squint) we used percentages and frequencies. Normality of data was checked using Shapiro-Wilk test¹⁵. The type of squint was stratified by gender and post-stratification Chi-square test was used. A p-value of < 0.05 was considered to be statistically significant.

Results:

A total of 57 patients were included in the study, 34 (59.65%) of which were males while 23 (40.35%) were females. The mean age of the study participants was 21.51 ±

7.22 years. Squint was observed in left eye only in 9 (15.79%), right eye only in 15 (26.32%), and in both eyes in 33 (57.89%) patients. The baseline demographics are tabulated below in Table I:

The frequency of “Exotropia” was 50 (87.72%) while of “Esotropia” was 7 (12.28%). This is depicted below in Figure 1.

Additionally, all the patients who had “Esotropia”, had “simple esotropia”. In the case of “Exotropia” (n = 50), 18 (36.00%) had simple while 32 (64.00%) had alternating exotropia. Type of squint was stratified by gender and it was found that among male patients (n = 34), “exotropia” was found in 29 (85.29%) and “esotropia” was found in 5 (14.71%) while in female patients (n = 23), “exotropia” was found in 21 (91.30%) and “esotropia” was 2 (8.70%), (p = 0.498). This data is given below in Figure 2.

Table I: Baseline Demographic Characteristics (n = 57)

Characteristic	Mean ± SD
Age	21.51 ± 7.22 years
Gender	Frequency (%)
Male	34 (59.65%)
Female	23 (40.35%)
Eye(s) involved	Frequency (%)
Left	9 (15.79%)
Right	15 (26.32%)
Both	33 (57.89%)

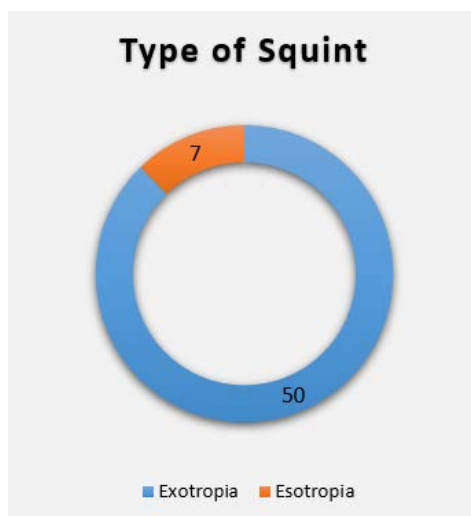


Figure 1: Type of Squint

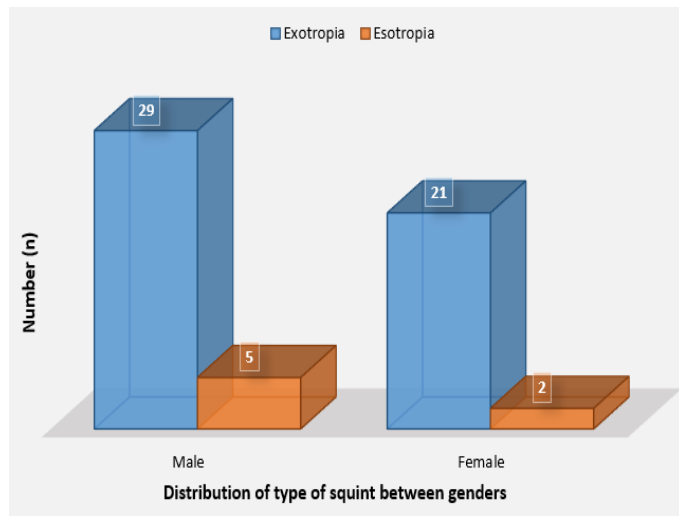


Figure 2: Gender Stratification of Type of Squint

Discussion:

Strabismus symptoms can potentially have a negative impact on a person's self-esteem, as well as their ability to participate in day-to-day activities and social activities¹⁶. Patients, especially children who have strabismus, for instance, have a lower chance of being invited to the birthday parties of their friends when compared to children who do not have strabismus¹⁷. In a recent population-based study, researchers found that preschoolers who had strabismus had a poorer quality of life in general when it came to their health, in comparison to children who did not have strabismus¹⁸. Patients who have chronic health diseases such as strabismus may be at risk for experiencing detrimental effects on their psychosocial wellness and development, in addition to the negative effects that these conditions have on their health-related quality of life. It has been found that patients with strabismus have a significantly higher incidence of psychiatric disorders including anxiety and depression than the general population does¹⁹. Therefore, it is essential to keep track of the burden of this disease in society.

In the present study, it was found that “exotropia (outward deviation of the eye)” was a much more common type of squint as compared to “esotropia (inward deviation of the eye)”, [87.72% and 12.28%, respectively]. This was consistent with the results of a study conducted by Junejo *et al.*²⁰ in which “exotropia” was more frequent type. However, opposite to our study, Qanat *et al.*²¹ reported “esotropia” to be the most prevalent type of strabismus. In present study, more patients were male (59.65%) indicating that frequency of strabismus is higher in male gender. This was opposite to what was reported by Junejo *et al.*²⁰ in which higher frequency was observed in female patients. Upon assessing the distribution of various types of squint in different gender groups, it was found that there was no statistically significant difference in the frequency of various types of squint between male and

female patients ($p = 0.498$). This was congruent with the findings of a study conducted by Zhang *et al.*¹⁰ but was opposite to what was reported in Martinez-Thompson *et al.*¹¹.

Based on these differences, it is recommended that epidemiological surveys should be carried out in different demographics of the world as this variation may be significant and help in proper estimation of disease burden. This will help in planning a comprehensive pathway to enroll and treat all the patients of strabismus in both genders and of any type. The limitations were inclusion of patients only from one institution, having a short follow-up period and a small sample size.

Conclusion

In conclusion, “Exotropia” is more prevalent type of strabismus in our study population with higher frequency in male population.

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