

## Frequency of strabismic amblyopia in school going and non-school going children among age group of 5 to 15 years.

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### ABSTRACT

**Objective:** To find out the frequency of association of amblyopia with strabismus in school going and non-school going children among age group of 5 to 15 years.

**Study Design:** A descriptive cross sectional study.

**Place and Duration:** Al Ibrahim Eye Hospital, Karachi, from 26th May 2018 to 26th November 2018.

**Methodology:** After interviewing the respondents all the respondents were underwent visual acuity assessment with Snellen acuity chart with and without correction, Cardiff card, cover/uncover test, cycloplegic refraction with cyclopentolate 1%, ocular movement examination, pinhole visual acuity and fundus examination was performed. Data was collected from both genders on a structured close ended questionnaire. The frequency of strabismic amblyopia in academic and non-academic children was assessed.

**Results:** A total of 351 respondents were interviewed. In which 66 % were girls while 34% were boys. School going children were 54.3 % while non-school going children were 21.4 %. The mean age was found to be  $9.62 \pm 3.1$  (ranging between 5 to 15 years). Eye examination was done in 106 eyes of 53 respondents. Frequency of strabismic amblyopia was found to be 15 % and 31.4% respondents were in the age group of 5 to 8 years.

**Conclusion:** Many children suffering from amblyopia due to different causes, strabismus (esotropia) is one of the main cause of amblyopia mostly in school going children. And high prevalence of moderate amblyopia was found which should be treated immediately to recover their vision.

**Keywords:** Strabismus, Amblyopia, School going children, non-schooled children, Esotropia, Exotropia

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### INTRODUCTION

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Misalignment of the eyes is called strabismus (or squint). Crossed-eyes are defined as eyes are not lined up to look at the same thing. In every case of strabismus or misalignment, one eye is fixed on what the person intends to see at (the fixing eye) and the other eye is looking at something else (the deviated eye)<sup>1</sup>.

1. Esotropia is a type of heterotropia in which one or both eyes turns inward. This is called esotropia.
2. One eye can be deviated outward (sometimes referred to as a 'wall eye'). This is called exotropia.
3. One eye can be deviated vertically, either upwards (hypertropia) or downwards (hypotropia)<sup>1</sup>.

Causes which are responsible for creating strabismus are such as ptosis, amblyopia, uncorrected refractive error, trauma, congenital, systemic factors, abnormal growth of bones of head, ocular deprivation and lazy eye etc<sup>1</sup>.

If eye ball pointing higher then hypertropia and if pointing towards lower then hypotropia, all these conditions are caused by the anomalies of the orbit<sup>2</sup>.

Amblyopia is the most common cause of monocular visual loss in children, affecting 1.3% to 3.6% of children. Current

treatments are effective in reducing the visual acuity deficit but many amblyopic individuals are left with residual visual acuity deficits. Amblyopia is diminished vision that results from inadequate visual experience during the first years of life<sup>3</sup>.

Worldwide prevalence of amblyopia is 2.5 % to 2.6 % of the general population in adults. While strabismus affects 19% which cause amblyopia<sup>4</sup>. In 2006, the prevalence of amblyopia was 2.2% in children of east, 1.7% in Asia<sup>5</sup>. 1.8% in white children while strabismus was 3.3% in white children<sup>6</sup>. Incidence of amblyopia was < 2% in white and African Americans while strabismus was 3.3% in white and 2.1% in African American preschool childre<sup>7</sup>. In central china amblyopia affects 2.5% while strabismus was 5.0%<sup>8</sup>. Amblyopia affects 6.7% in Pakistan in the OPD of Dow University of Health Science in 2016 while strabismus was reported 3.6%<sup>9</sup>. And in Lahore, Pakistan school going children were screened out, result was concluded that 1.5% school going students had amblyopia while Strabismic amblyopia affects 0.5%<sup>10</sup>. In Hayatabad medical complex, Peshawar, Pakistan the frequency of strabismic amblyopia was 38%<sup>11</sup>.

Many factors may contribute towards poor result of treatment. These include lack of sufficient explanation to the respondents with resultant less involvement of respondents, long distance involved, irregular follow up, shortage of knowledge of effective treatment of amblyopia, unavailability of primary eye care screening services, uncooperative subjects when prescribed occlusion therapy and parents are also careless sometimes and parental demand for quick squint surgery for cosmetic purposes.

Many children suffering from Amblyopia due to different causes, which should be treated immediately to recover their vision. This research can also be helpful in bringing awareness to society.

This study was conducted with the objective to find out the frequency of strabismic amblyopia in schooled and non-schooled children within the age group of 5 to 15 years.

## METHODOLOGY

This descriptive cross-sectional study was carried on 351 strabismic respondents visiting Orthoptic Department of Al-Ibrahim Eye Hospital, Malir, Karachi. Data was collected from 26<sup>th</sup> May 2018 to 26<sup>th</sup> November 2018 by the non-probability convenience sampling method from both genders. Prior permission was taken from ethical review board of the institute before collecting data. Informed consent form had taken from the study respondents and confidentiality of the respondents was collected.

A pilot study was directed on 10 subjects that resulted in a structured close ended questionnaire. Patients in pediatric department of age group 5 to 15 years were selected who have strabismus. Amblyopia was distinguished as decreased best corrected visual acuity 6/18 or less in one eye or 2 lines Snellen acuity differences in the absence of pathological cause. All the respondents were underwent visual acuity assessment with Snellen acuity chart, Cardiff card, lea symbol chart and pinhole.

Cycloplegic refraction was done with cyclopentolate 1%. Ocular movement examination and visual acuity was checked with and without correction and fundus examination was performed. Objective refraction was performed via retinoscope. These tests helped for the determination of frequency of amblyopia with strabismus in schooled and unschooled children, self-prepared Performa was used for data collection, and the instruments which had been used for data collection includes Snellen chart, near chart, Cardiff card, lea grating, torch, prism bar, pinhole, autorefractometer, retinoscopy, and the funduscopy was done by ophthalmologist, after performing all these tests, we were able to diagnose strabismic amblyopia and amblyopia was confirmed through funduscopy and Cycloplegic refraction.

**Data Analysis:** The data was collected from the orthoptic department of Al Ibrahim Eye Hospital and questionnaire was filled by the researcher (myself). Statistical Analysis had done from statistical package for social sciences (SPSS) version 20.0. The entire categorical variable showed in frequencies and percentages.

## RESULTS

In Orthoptic clinic 351 patients had interviewed out of which 53 (15 %) subjects were diagnosed with strabismic amblyopia. In which 66 % (n=35) were girls while 34 % (n=18) were boys. The mean age was found to be  $9.62 \pm 3.1$  ranging between 5 to 15 years of age. Eye examination was done in 106 eyes of 53 respondents. Frequency of strabismic amblyopia was found to be 15% (n=53). And the percentage of school going children was 71.7% (n=38) while non-school going children was 28.3% (n=15). It was found that 41.5% (n=22) respondents among the age group of 5 to 8 years. Most of the respondents 54.7% (n=29) had visual acuity 6/6 to 6/18 in right eye without correction and 30(56.6%) had visual acuity 6/6 to 6/18 in left eye without correction.

**Table-I: Figure of amblyopia in different age group (N=53)**

Age Group	Amblyopia (%)
5-8	22 (41.6 %)
9-12	20 (37.7 %)
13-15	11 (20.7 %)
Total	53 (100 %)

Out of 53 respondents 24.5 % (n=13) had visual acuity less than 3/60 in right eye and 3.77 % (n=2) had visual acuity less than 3/60 in left eye. 70.0 % (n=37) respondents had near visual acuity in between N.6 to N.12 in right eye while 71.6 % (n=38) respondents had near visual acuity in between N.6 to N.12 in left eye.

Amblyopia was 54.7 % (n=29) in the right eye. Majority of respondents 41.5 % (n=22) were diagnosed with esotropia and 13.2 % (n=7) had exotropia in the right eye while least number of respondents were diagnosed with vertical deviation 2 % (n=1) and 2 % (n=1) had alternate tropia. And in left eye 39.6 % (n=21) respondents had esotropia, 7.54 % (n=24) had

exotropia, 1.9 % (n=1) had vertical deviation.

Amblyopic girls were found to be 66 % (n=35) whereas 34 % (n=18) were boys. Within the age group of 5 to 8 years the presence of strabismic amblyopia was 41.5 % (n=22).

**Table-II: Degree of amblyopia in schooled and non-schooled children (N=53)**

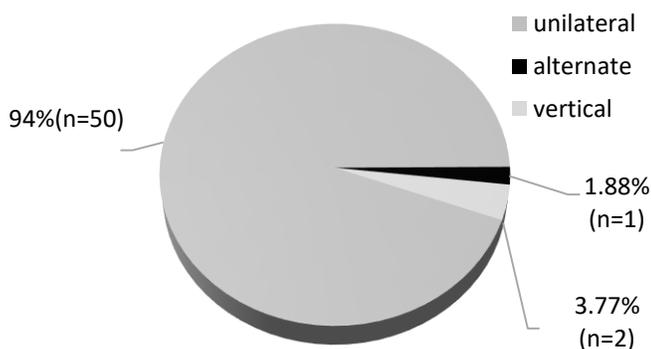
	Mild (%)	Moderate (%)	Severe (%)	Total (%)
School going	27 (71%)	7 (18.4%)	4 (10.6%)	38 (100%)
Non-school going	8 (53.3%)	5 (33.4%)	2 (13.3%)	15 (100%)

**Table-III: Type of squint and degree of amblyopia (N=53)**

Type Of Squint	Density Of Amblyopia			
	Mild (%)	Moderate (%)	Severe (%)	Total (%)
Esotropia	26(49.0%)	9(17.0%)	4(7.6%)	39(73.6 %)
Exotropia	8(15.1%)	2(3.8%)	1(1.9%)	11(20.7 %)
Alternate tropia	0(0.0%)	1(1.9%)	0(0.0%)	1(1.9%)
Vertical	2(3.8%)	0(0.0%)	0(0.0%)	2(3.8%)

## DISCUSSION

Amblyopia and strabismus are more common in childhood which results in loss of vision. Association of amblyopia and frequency of strabismic amblyopia is justified by many authors worldwide. In Karachi strabismic amblyopia was 6.7% and age group of subjects was 5 to 20 years<sup>8</sup>. In another study, which is conducted at Peshawar, Pakistan in which 38% subjects had strabismic amblyopia and age group of subjects was 8 years (3 to 14 years)<sup>10</sup>. And 7.5% strabismic amblyopia was diagnosed in African American children<sup>12</sup>.



**Figure-1: strabismus associated with amblyopia (N=53)**

In the present study frequency of association of amblyopia with strabismus was found to be 15%, it is the combined frequency of strabismus and amblyopia there was a comparison between school going and non-school going children, where it was found that the ratio of academic respondents was higher than non-academic respondents and also the higher ratio of female than males were found. While

the study conducted in Karachi, schooled and non-schooled respondents were not focused but similarly that study contains higher ratio of girls 63.9 % than the boys 36.1 % were found<sup>8</sup>.

It was more important to consider that the incidence of amblyopia in unilateral squint had found to be higher 94.3 % than alternating squint 1.88 %. It is quite clear that those strabismic respondents who developed alternation were at the least risk of developing amblyopia than unocular squints.

In this study out of 351 strabismic subjects 53 respondents had a small degree of amblyopia despite of the type of deviation. So the overall prevalence of strabismic amblyopia was 15 %.

We found the proportion of mild amblyopia approximately 66% and moderate amblyopia was found 22.6 % and severe amblyopic ratio was lowered about 11.3 % in patients due to strabismus. The direction of the deviation had some relation to the development of amblyopia<sup>13</sup>.

According to this study the prevalence of amblyopia in esotropia was higher 81.1 % than its frequency in exotropia 20.7 % and vertical deviation 3.77 %. Same as in another studies but slightly different figure are seen worldwide<sup>13</sup>. it was noted that there was higher ratio of school going subjects 71.7% while non-school going ratio was 28.3 %, because of unawareness of parents of non-schooled about eye care and disorders, They came to attention only when there is injury or trauma to the eye then they are also diagnosed as amblyopic and strabismus.

Three acceptable classification of amblyopia is mild, moderate, and severe or dense. Mild when there is a difference of two lines, moderate when difference of three lines and severe or dense when difference of four lines or more lines between the visual acuity of two eyes.

## CONCLUSION

Many children suffering from amblyopia due to different causes, strabismus (esotropia) is one of the main cause of amblyopia mostly in school going children. And high prevalence of moderate amblyopia was found which should be treated immediately to recover their vision.

**Recommendations:** We should spread awareness regarding eye condition or disease follow-up as patients usually do not come for follow-up properly and we should also conduct some awareness programs in areas where parents and children are not educated.

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## AUTHOR'S CONTRIBUTION

**Saleem A:** Conceived idea, Literature review, Manuscript writing, Data collection, Data analysis.

**Kazi U:** Literature review, Manuscript writing.

**Nehal I:** Literature review, Manuscript writing.

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