

# Type of Horizontal Deviation in Consanguinity

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**Purpose:** To find out the association and types of horizontal deviation in consanguinity.

**Study Design:** Cross-sectional study.

**Place and duration of Study:** Department of ophthalmology, The University of Lahore teaching hospital from September to December 2017.

**Material and Methods:** In this study, 93 patients of 3 to 15 years, with diagnosis of horizontal deviation and positive history of consanguinity were included in the study. While the patients with vertical deviation and negative history of consanguinity were excluded from study. Data was collected by self-designed proforma after taking consent from patients having history of consanguinity. The visual acuity screening and orthoptic assessment were performed on the sample of 93 patients using snellen chart for visual acuity and pen torch for Hirschberg test, cover uncover test and alternate cover test and prisms for krimsky test. Data was analyzed using SPSS version 20.

**Results:** Out of 93 patients, 55 (59.1%) had exotropia and 38 (40.8%) had esotropia. 17 (18.2%) had emmetropia, 22 (23.65%) had myopia, 7 (7.5%) had hyperopia, 25 (26.8%) had myopic astigmatism, 10 (10.7%) had hyperopic astigmatism and the remaining 12 (12.9%) had mixed astigmatism.

**Conclusion:** It is concluded that consanguinity is related with horizontal deviation and refractive errors.

**Key Word:** Consanguinity, Horizontal deviation, Myopia.

Misalignment of the eyes is called Deviation. It is also called squint or strabismus. Deviation is a state in which the eyes do not appropriately align with each other while focusing at an object. Deviation can be constant or intermittent. Horizontal deviation is misalignment of eyes. It may be one or both eyes. Horizontal deviation is divided into two main types; the first one is Esodeviation and second is Exodeviation. In Esodeviation the eyes misaligned inward i.e. crossed eyes. Convergent deviation is the other name of Esodeviation. In Exodeviation, the eyes are misaligned outward. Exodeviation is also known divergent deviation<sup>1</sup>.

Consanguinity is the belongings of being from the same kinship as another person. In that characteristic,

parental cousin marriages is the quality of being descend from the similar antecedent as another individual<sup>2</sup>. The credential of relative consanguinity may be confirmed with a consanguinity table wherein every level of lineal consanguinity (meiosis) appears as a row<sup>3</sup>. The Consanguinity causes other main disorder given below<sup>3</sup>.

- Premature ear shot damage.
- Premature visual system development and perceptive damage.
- Intelligent delay or learning disorder.
- Growing delay or failure.
- Hereditary blood disease.
- Mental disorder like Epilepsy<sup>4</sup>.

Several recent studies suggested that there is greater frequency of horizontal deviation amongst parental cousin marriages<sup>5</sup>. Survey on 7200 patients of strabismus has shown that almost 30% patients had a positive history of consanguinity<sup>6</sup>.

The genetics of common styles of horizontal deviation is not properly diagnosed. The mode of horizontal deviation may be recessive, dominant or having different factors. Numerous chromosomal susceptibility loci had been cautioned.<sup>7</sup> It appears that the dominant and recessive association and codominant heirloom type of transmission was associated with esotropia in early age. The horizontal deviation seen due to autosomal recessive genetics is mentioned in consanguinity<sup>8</sup>.

Regarding these records, it appears that evidently recessive shape of heirloom shows an essential position within the case of horizontal deviation. Alteration in selection correspondences can be sought-after pre revealing of horizontal deviation in children of parental cousin marriages<sup>9,10</sup>.

**MATERIALS AND METHODS**

It was cross sectional study conducted on 93 patients. In this study 93 Patients of 3 to 15 years, with diagnosis of horizontal deviation and positive history

of consanguinity were included. While the patients with vertical deviation and negative history of consanguinity were excluded from study. Sample size was estimated by probability convenient method. All patients were diagnosed with horizontal strabismus by orthoptic assessment. Patients of all other ages or having no positive history of consanguinity were excluded from the study. The purpose of the study was to find the type of horizontal strabismus in consanguinity. Therefore, all patients underwent measurement of distance (6 m) and near (33 cm) visual acuity by using near visual acuity charts and Snellen distance charts. Orthoptic assessment, Hirschberg, cover uncover test and alternate cover test were done to rule out the horizontal deviation. Data was collected by self-designed proforma after taking consent from patients having history of consanguinity. The results were analyzed by using SPSS version 20.

**RESULTS**

Results of Table 1 shows that 93 patients were involved in study. Out of 93 patients 28 (30.1%) were males and 65 (56.9%) were females. Table 2 shows the age distribution of 93 patients.

Below table 3 shows that out of 93 patients, 55 (59.1) had exotropia and 38 (40.8%) had esotropia.

**Table 1:** Gender.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	65	56.9	56.9	56.9
	Male	28	30.1	30.1	30.1
	Total	93	100.0	100.0	100

**Table 2:** Age Distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 – 6	19	20.5	20.5	20.5
	7 – 11	38	40.8	40.8	79.5
	12 – 15	36	38.7	38.7	100.0
	Total	93	100.0	100.0	

**Table 3:** Type of Deviation.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Esotropia	38	40.8	40.8	40.8
	Exotropia	55	59.1	59.1	100
	Total	93	100.0	100.0	

**Table4:** Distribution of patients according to Refractive Error.

	Frequency	Percent	Valid Percent	Cumulative Percent
Emmetropes	17	18.2	18.2	18.2
Myopia	22	23.65	23.65	41.8
Hyperopia	7	7.5	7.5	49.3
Valid Myopic Astigmatism	25	26.8	26.8	76.1
Hyperopic Astigmatism	10	10.7	10.7	88.8
Mixed astigmatism	12	12.9	12.9	100.0
Total	93	100.0	100.0	

17 patients (18.2%) were emmetropes and 22 (23.65%) were myopes. Out of 93, 7 (7.5%) were hyperopes, 25 (26.8%) showed myopic astigmatism and 10 (10.7%) had hyperopic astigmatism. The remaining 12 (12.9%) had with mixed astigmatic error.

## DISCUSSION

The consanguinity and types of horizontal deviation is not properly identified. The mode of horizontal deviation inheritance can be dominant, recessive, or multifactorial. Oligogenic heirloom for childhood esotropia was seen in a huge parental cousin marriages population<sup>12</sup>. Similar results were obtained from recent study. Autosomal recessive inheritance in horizontal deviation has been seen in consanguinity and mostly infantile esotropia seen with hypermetropia<sup>13</sup>.

It is concluded from another study that due to autosomal recessive linkage, higher myopia was associated with exotropia in many children. All these children of myopia with exotropia had positive history of consanguinity<sup>14</sup>. Infantile esotropia with hypermetropia and exotropia with myopia cases were observed due to consanguinity. Anisometric amblyopia in many school-going children were examined and 65% had positive history of consanguinity<sup>15</sup>.

The parental cousin marriages is an extremely rooted community approach between one fourth of the world populace<sup>3</sup>. Consanguineous communities are trying to find counseling on consanguinity<sup>16</sup>. The number one health care agencies are faced with consanguineous couple stressful solutions to their questions on the predicted health dangers to their offspring<sup>17</sup>. In clinical inheritances, a parental cousin

marriages is defined as a relation between two individuals who are associated as second cousins or closer, with the coefficient breeding equal or higher than 0.0157, where the coefficient characterizes extent of the ratio of loci at which the children of a parental cousin marriages is predictable to inherit identical copies of genes from both parents<sup>18</sup>. Similar studies suggested that inheritance has an important role in the etiology of strabismus. Previous studies indicated the occurrence rate of 70 to 85% among monozygotic twins and 35 to 50% among dizygotic twins and all these offspring have significant myopia with exotropia<sup>19</sup>. In another similar research, strong genetic element in hyperopic accommodative esotropia was observed<sup>20</sup>. Schlossmann and Priestley suggested that 47.8% of patients with horizontal deviation, 49.9% with esotropia and 36.9% with exotropia, had positive history of parental cousin marriages<sup>21</sup>. Other similar research showed that incidence of horizontal deviation in consanguinity is 65% higher as compared to normal population<sup>22</sup>.

## CONCLUSION

Consanguinity causes abnormality in the eyes and causes refractive errors. Horizontal deviation is seen in the children having age 3 to 15 years and positive history of consanguinity. It is concluded that consanguinity causes deviation in the eyes i.e. horizontal deviation and refractive errors.

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