IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 13, Issue 1 Ver. V. (Jan. 2014), PP 32-35
www.iosrjournals.org

A Clinico-Anatomical Study of Strabismus in a Tertiary Care Hospital

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Abstract: *This prospective study was conducted about the clinical profile, extraocular muscle involvement, epidemiology and the etiology of 162 cases of manifest strabismus attending the Ophthalmology outpatient department from July 2009 to July-2011. Incidence of manifest strabismus was found to be 0.63%, of which 63% were paralytic and 37% non paralytic, 66% were esotropia and 34% exotropia. Paralytic esotropia was common in the age group of 41-50 years (46.4%) and nonparalytic in 0-10 years (47.4%). Males dominated over females whether esotropia or exotropia. Paralytic exotropia was common in 41-50 years (45.6%) and non paralytic in 0-10 years (45.5%). Paralytic strabismus was common in the lower socioeconomic group (52.9%) and non paralytic in middle and higher class (86.7%). Abduction defect was found in 73.5% due to lateral rectus muscle involvement. Abducent nerve palsy was the most common cause of paralytic strabismus (56.8%) followed by oculomotor nerve (21.6%).No isolated 4th nerve involvement was encountered. Involvement of more than one cranial nerves was found in 21.6%.Most of the patients presented with deviation of eye followed by diplopia and defective vision. Vascular involvement was the commonest etiology in the paralytic group. Ophthalmologists need to be trained and well equipped strabismus clinics should be established in this part of the country.*

Key words:*Strabismus,Esotropia,Exotropia,Extraocular muscles*

I. Introduction

Strabismus (Crooked eye or squint) is a condition in which the eyes are not properly aligned with each other. It typically involves a lack of coordination between the extra ocular muscles. It can either be a disorder of brain coordinating the eyes or one or more muscles. Two to four percent of world's total child population are reported to have strabismus. Clinically strabismus can be classified as true (Heterotropia) or latent (Heterophoria) type. In true or manifest type, the manifestations are always present. In latent type, the manifestations appear during stressful periods only. Again the manifest strabismus can be of paralytic or non paralytic type, the former mainly involving the extraocular muscles. A set of seven extra ocular muscles(4 rectii,2 obliques and levator palpebrae superioris) control the movements of each eye. Rectus muscles are superior, inferior, medial and lateral rectus. The oblique muscles include superior and inferior oblique..As.one of the least developed wings of ophthalmology is strabismus and most of the earlier studies deal with its clinical aspect and management,in this study we focused on clinical profile,extraocular muscle involvement, epidemiology and etiology of 162 cases of strabismus.to highlight its anatomical aspect correlated with clinical findings.

II. Materials& Methods

This prospective study was carried out from June 2009 to June 2011. All manifest strabismus cases of different types independent of age & sex attending the outpatient department of Ophthalmology were included in the study.

A careful history regarding age of onset, duration, eye affected, whether intermittent or constant, alternating or fixed, precipitating factors, diurnal variation of deviation was obtained.

Any past history of prescription of glasses or occlusion, family history of strabismus in blood relatives, defective vision and refractive error was recorded. General and systemic examinations along with examination of eye and ocular adenexa were done.

The specific tests like Cover-uncover test,Prism bar cover test,Hirschberg test,Worth four dot test,Synatophore test,Baggoloni striated glass test and Forced duction test were done whenever required.

III. Observation:

Out of 25615 patients attending the outpatient department of ophthalmology, 162 patients diagnosed as manifest strabismus were studied and the following observations were made:

Table-1
Incidence of Manifest Strabismus

Total no. of patients	Total number of Manifest Strabismus	Incidence (%)
25615	162	0.63

TABLE-2
Type of Manifest Strabismus (According to Etiology)

Type of strabismus	No.of Patients	Percentage
Paralytic	**102**	**63.0**
Nonparalytic	**60**	**37.0**

TABLE-3
Type of Manifest Strabismus (According to Deviation)

Type of Strabismus	No.of Patients	Percentage
Esotropia	**107**	**66.0**
Exotropia	**55**	**34.0**

TABLE-4
Epidemiological Profile & Etiology

Criteria	Paralytic		Nonparalytic	
	Esotropia	Exotropia	Esotropia	Exotropia
Commonest age group	41-50(46.4%)	41-50(45.6%)	0-10(47.4%)	0-10(45%)
Sex	Male>Female		Male>Female	
Socioeconomic status(SES)	Common in lower SES		Common in middle & higher SES	

Table-5
Type of Extraocular Muscle Function Defect

EOM function defect	No of patients (n=102)	Percentage
Abduction	75	73.5
Adduction	25	24.5
Elevation	27	26.5
Depression	23	22.5

Table 6
Extraocular Muscle Involvement

EOM	No of patients(n=102)	Percentage
Lateral rectus	75	73.5
Medial rectus	25	24.5
Superior rectus	27	26.4
Inferior rectus	23	22.5
Inferior oblique	22	21.5
Superior oblique	5	4.9
LPS	18	17.6

Table 7
Nerve involvement

Nerve	No of patients (n=102)	Percentage
Abducent	58	56.8
Oculomotor	22	21.6
Trochlear	0	0
Mixed	22	21.6

Table 8
Clinical symptoms

Symptom	No of patients(n=162)	Percentage
Deviation	142	87.6
Defective vision	73	45.0
Diplopia	91	56.1
Headache	87	53.7
Head tilt	69	42.5

Table 9
Etiology of paralytic strabismus

Causes	No of patients (n=102)	Percentage
Vascular	44	43.1
Inflammatory	14	13.8
Head trauma	4	3.9
Tumor (SOL)	2	1.9
Congenital	1	0.9
Pseudotumor of orbit	10	9.8
Dysthyroid orbitopathy	8	7.9
Orbital trauma	4	3.9
Idiopathic	15	14.8

Table 10
Etiology of Nonparalytic strabismus

Causes	No of patients (n=60)	Percentage
High refractive error	35	58.4
Opacity in media	14	23.3
Retinal diseases	2	3.3
Abnormal AC/A ratio	5	8.3
Congenital	4	6.7

IV. Discussion

Most of the studies done on strabismus during 1955 to 2007 reveal the incidence to be more than 1% whereas our study reported the incidence to be 0.6%.This may be due to lack awareness regarding treatment of strabismus .The ratio of esotropia:exotropia was found to be 1.94:1 which is consistent with Mohney et al(2007)[1],Robai et al (2005)[2] and Ohlsson et al (1999)[3],however the ratio was reverse as per Lim et al(2004)[4],Nepal et al(2003)[5] and Matsuo et al(2003)[6].More number of esotropia in our study is due to higher incidence of 6th neve palsy. Paralytic esotropia was common in 41-50 years(45.6%) and non paralytic in 0-10 years(45.5%) which is consistent with Suraj Shakya et al(2004)[7].Paralytic exotropia was also common in 41-50 years (45.6%) and non paralytic in 0-10 years (45.5%).Further Males dominated over females in our study irrespective of the type of strabismus. This is probably because males are given priority to be brought to the hospital for strabismus. Paralytic type was more common in lower socioeconomic group (52.9%) and non paralytic in middle and higher class (86.7%) . The lack of awareness among people regarding the treatment of strabismus and social taboo associated with the disease obstruct the lower socioeconomic group to attend the strabismus clinic.This may be the possible cause for the higher incidence of non paralytic squint in middle and higher economic class.However the annoying symptom of diplopia in paralytic type compels the lower socioeconomic group to attend the ophthalmologists.98% of total paralytic strabismus was unilateral in our study which is consistent with AbdolrezaMedghalahi et al[8],J.Holme et al[9],SurajShakya et al[7] .Abduction defect was the most common extraocular function defect because of increased incidence 6th nerve palsy in paralytic group.Multiple cranial nerve involvement was seen in 21.6% of paralytic group which is quite higher as compared to study by AbdolrezaMedghalahi et al[8] because trauma was an important cause of paralytic strabismus in our study which involved multiple nerves.We did not come across isolated 4th nerve palsy which is interesting to note.However AbdolrezaMedghalahi et al[8] found the isolated 6th nerve palsy in 70.2% of cases and Jonathan Holmes et al[9] found 4th nerve as thecommomest involvement. As most of the cases are paralytic in origin in our study,deviation of eye(87.6%) and diplopia(56.1%) were the predominant symptoms which is consistent with SurajShakya et al[10].The commonest etiology in paralytic group was of vascular origin which is consistent with Moster et al[10] and Berlit et al[11].High refractive error and opacity in media were found to be the major causes of non paralytic strabismus .Further, the deviation in the non paralytic strabismus was mainly because of amblyopia.

V. Conclusion

The anatomical knowledge of extra ocular muscles, their function and knowledge about ocular nerves is highly essential for correct diagnosis and proper treatment of strabismus population. This study will help the ophthalmologists to know the incidence, various prevailing causes, laterality, socioeconomic status of the affected patients and about the age & sex distribution of strabismus, so that they can plan for a well equipped strabismus clinic with trained persons to lessen the burden of this socially cursed disease for which many people are suffering since a long time in this part of the country.

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