

OUTCOME AND ANALYSIS OF NONSURGICAL MANAGEMENT OF CONCOMITANT STRABISMUS IN A TERTIARY EYE CARE CENTRE

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ABSTRACT

BACKGROUND

Aim of this study is to analyse the non-surgical management of concomitant strabismus in a tertiary eye care centre in South India.

MATERIALS AND METHODS

A hospital based study of 50 patients who presented with concomitant strabismus were selected, examined and subjected to non-surgical management and analysed.

RESULTS

We found that 36% of patients were between 1 and 10 years. 42% of patients were 11 to 20 years. 22% were above 20 years. Accommodative esotropias had excellent improvement with spectacles. Exophorias of convergence insufficiency improved by orthoptics. Anisometropic amblyopia due to myopia responded better than hypermetropia.

CONCLUSION

Early detection and early orthoptic treatment give an indication that success rate of sensory orthophoria is higher if detected and treated early. Only cosmetic motor orthophoria is achieved in cases with higher age of detection.

KEYWORDS

Concomitant Squint, Exophorias, Amblyopias, Orthoptics.

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BACKGROUND

This study was conducted to analyse the non-surgical management of concomitant strabismus and to ascertain the efficacy of non-surgical management of squint in attaining binocular single vision or at least cosmetic orthophoria.^{1,2}

MATERIALS AND METHODS

Hospital based case series of 50 cases of squint of concomitant origin were analysed. All cases of congenital or acquired nerve palsies resulting in incomitant deviations were excluded. All post-traumatic deviations, myopathies were also excluded. Documentations included age, gender, detailed history focusing on age of onset of squint, detailed ocular examination focusing on anterior segment, visual acuity, refractive status, ocular movements, cover test, Worth four dot test, prism bar cover test, fundus examination with links star for fixation status - (fovea,

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eccentric fixation or saccadic). Major Amblyoscope/synoptophore examination for testing the grades of binocular single vision before and after treatment was done.

Non-surgical modalities adopted were

1. Spectacles: Appropriate optical correction of refractive error.^(3, 4, 5)
2. Conventional Occlusion: Occluding the normal eye.^(6,7)
3. Home Exercises: Especially exophorias.

RESULTS

At Birth	19
1 – 10 Years	14
11 – 20 Years	14
21 – 30 Years	2
31 – 40 Years	1
Table 1. Age of onset	

At Birth	-
1 – 10 Years	18
11 – 20 Years	21
21 – 30 Years	9
31 – 40 Years	2
Table 2. Age of Diagnosis	

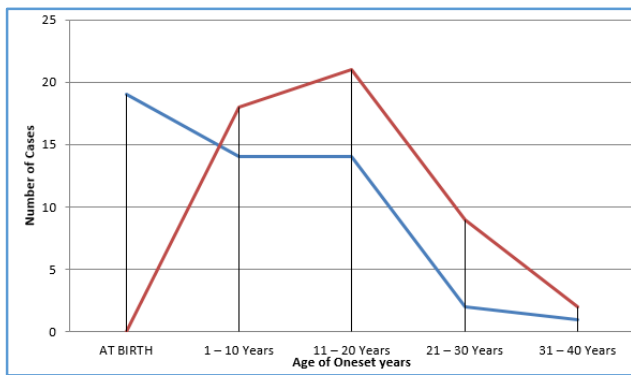


Figure 1. Graphic Analysis of Onset and Age of Diagnosis

Age Group	No. of Cases
1 – 10 Years	13
11 – 20 Years	5
21 – 30 Years	-
31 – 40 Years	1

Table 3. Number of Cases Reported

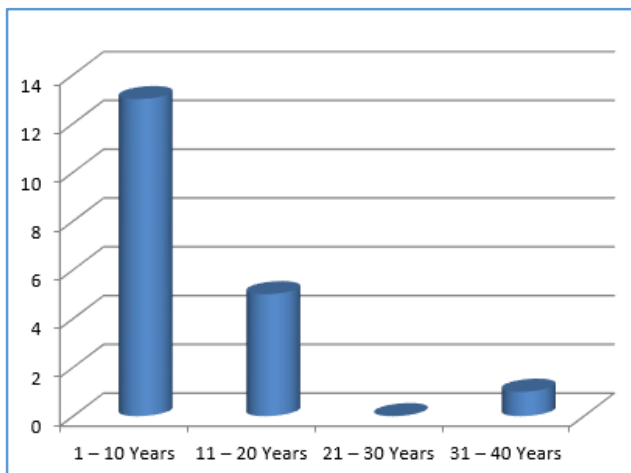


Figure 2. Number of Cases Reported

Diagnosis Patterns

Diagnosis Pattern	No. of cases
Esotropia	15
Exotropia	14
Exophoria	10
Esophoria	2
Amblyopia	9
Unicocular	15
Alternators	18
Amblyopia (without deviation)	5
Phoria	12

Table 4. Diagnostic Patterns

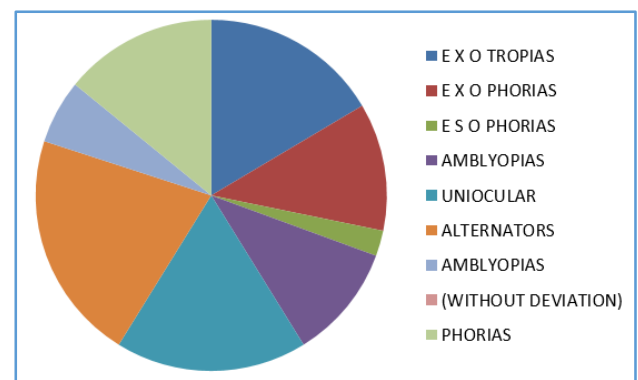


Figure 3. Diagnosis Pattern in this Study

Treatment

1.	Pure "No surgery" or "spectacles"	Orthoptics	- 11 Cases
2.	Postoperative (Patients who had initial surgery)	Orthoptics	- 10 Cases
3.	Spectacles + Orthoptics		- 14 Cases
4.	Contact lens + Orthoptics		- 10 Cases
5.	Pleoptic + Inverse occlusion		- 2 Cases
6.	Prisms		- 2 Cases
7.	Spectacles alone		- 5 Cases
8.	Conventional Occlusion		- 2 Cases (Late presentation)

Sl. No.	Treatment Modality	No. of Cases	IMP	IMP	NO IMP
1.	SP	2	-	2	-
2.	SP + ORE	5	3	2	-
3.	IS + ORE + SP	9	8	-	1
4.	PL	3	2	-	1
5.	AMB – CO	1	1	-	-

Table 5. Treatment Modalities And Responses

- SP - Spectacle
- ORE - Orthoptic exercise
- IMP - Improvement
- MOD - Moderate
- PL - Pleoptic
- IS - Initial surgery
- AMB - Amblyopia
- CO - Conventional Occlusion

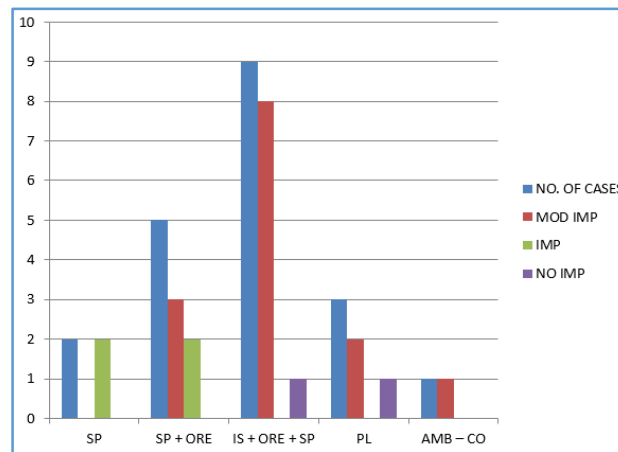


Figure 4. Treatment Modalities in Esodeviations

Sl. No.	Age of Onset	Age of Diagnosis	Type of Amblyopia	Deviation	Treatment	Followup
1.	16	22	AN AMB	R X T	CL/ORE	MI
2	8	14	AN AMB	L X T CI	SP/ORE	I
3	12	25	AN AMB	R X T	CL/ORE	NI
4	NK	12	AN AMB	R X T	CL/ORE	NI
5	1	15	AN AMB	X	CL/ORE	I
6	B	17	STR AMB	L E T ECF	IS/SP/PL	MI
7	9	11	AN AMB	-	SP/ORE	I
8	10	22	AN AMB	-	SP/ORE	I
9	22	22	AN AMB	-	SP/ORE	MI
10	B	14	AN AMB	L X T	SP/ORE	NI
11	8	16	AN AMB	X	CL/ORE	I
12	18	18	AN AMB	-	CL/ORE	MI
13	3	10	STR AN AMB	L E T	IS/CO/ORE	MI

Table 6. Amblyopia – Diagnostic Pattern in This Study

- Hypermetropic anisometropia - 31%
- Myopic anisometropia - 23%
- Strabismus - 15.3%
- Unioocular aphakia - 30.7%

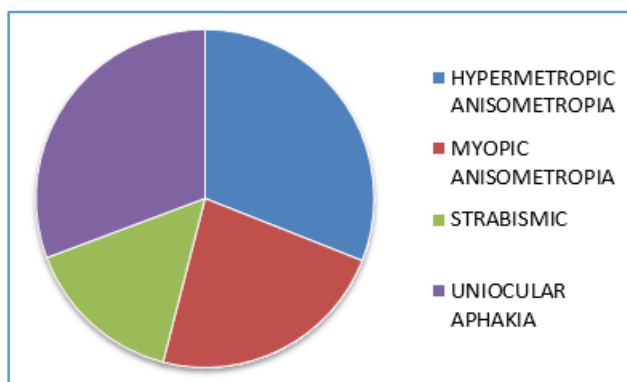


Figure 5. Anisometropic Amblyopia Patterns

DISCUSSION

Of all the nonsurgical modalities adopted in this study, spectacles and contact lenses are the most successful ones.⁵ Age factor plays a very major role - since patients were too young for active pleoptic and orthoptics therapy or too old for it to be effective, reporting for exercises regularly was a

difficult factor, and there was no proper supervision of home exercises. Lack of awareness and false beliefs about squints were also stumbling blocks in the treatment.

Most of the patients reported with rather established amblyopia and the success depended upon the degree of function before amblyopia sets in and the age at which treatment was instituted. Both sexes were affected equally. Lagreyzes (1913), Worth (1903) in their studies found that unioocular squints were 89% and alternators 11%. The visual acuity in unioocular cases were grossly unequal in 67% of cases i.e. the squinting eye definitely showed low vision. Whereas alternators had equal visual acuity in 90% of cases. In this study, unioocular squints were 15 cases, and the visual acuity was unequal in 13 cases, alternators had equal visual acuity in both eyes. There was no sex predilection in squint.

Age of Onset and Age of Diagnosis

Age of onset is noticed earlier in our studies but age of diagnosis or age at which child is brought to the squint department is rather late. Harman (1967) study revealed, presenting age group between 5 and 7 years declining thereafter until 13 years. Whereas in our study, the presenting age group was between 8 and 20 years. Only 22% of patients were below 5 years, whereas 27 cases (54%) were between 8 and 20 years.

Spectacles

Spectacles alone or with atropine when necessary or occlusion in uncomplicated accommodative esotropias - sufficient if treated early.⁸

Keith Lyle and Jackson (1940) ⁽¹⁾ reported 59% success by these methods in uniocular and 54% among alternating squint. Early correction of refractive errors almost eliminate development of anisometropic amblyopia, reduce symptoms in phoria and hence spectacles correct the refractive error and equalise vision and are of immense help in establishing binocular single vision

Spectacles with anti-suppression exercises improved the prognosis in anisometropic amblyopias.

Anisometropic Amblyopia

Anisometropic amblyopia⁷ when treated after early detection, using spectacles, contact lenses and orthoptics seem to respond well (Awasti 1968).⁸ However, success in anisometropic amblyopia is because suppression of vision is a passive process not an active suppression like strabismic amblyopia study by Philips in 1959, Pigasson 1969. Lagleyzes 1913 study found depth of amblyopias varies with the degree of anisometropic. Helveston 1966 in a series of 57 cases found no correlation. Jampolsky et al 1955 found incidence of amblyopia less in myopia and more in hypermetropia cases.

In this study, 23% of cases had myopic anisometropia, 30.7% had uniocular aphakia, 31% had hypermetropic anisometropia. Responses to spectacle correction and or contact lenses with orthoptics proved to be very effective, only if treatment is instituted in the younger age group.

Uniocular Aphakia

Uniocular aphakia.² exemplifies the most marked degree of anisometropia. Amblyopia because of unfocused image, diplopia with glasses due to 30% magnification of images, time lapse before and after surgery and presence of deviation were responsible for lack of improvement. (Duke Elder Vol. VI p 298)(2). In this study case, where the contact lenses were not immediately prescribed after the surgery and when divergent strabismus was present preoperative or post-operative results were poor.

Prisms

In our study, prisms were used for diagnosis and Orthoptics. Prisms were prescribed only for one case, because patients couldn't accept the idea of treatment for squint without straight eyes.

Drugs

Mitotics along with correcting spectacles introduced by Abraham (1949) (AJO 32, 233, 1949, use of mitotic in the treatment of convergent strabismus) was found to be successful only in cases where suppression had not developed. In our study, application of drug twice a day by the patient and economic constraints were the stumbling factors, so only in one case pilocarpine was prescribed.

Conventional Occlusion

Conventional occlusion in amblyopia.^{3,9} in this study could be done only in one patient and even he was 14 years old. The result was not encouraging.¹⁰

Pleoptics and Inverse Occlusion

In this study, two patients who had large deviations with eccentric fixation were corrected by surgery.^{4,8} followed by inverse occlusion and pleoptics though both were regular for treatment, they were 17 and 8 years old, it turned out to be an academic exercise, the fixation persisted eccentrically.^{3,4,6,11} Ayberk (1968) found that only 24% of cases achieved true binocular vision although 43.2% attained improved vision, but treatment should commence between 2 to 5 years.

However, it is obvious from the above data that once eccentric fixation sets in, it is not only difficult to get back to centric fixation, but also to maintain it.

Pleoptics was done with Euthyscope and alternoscope in this study, since eccentric fixation persisted, no binocular training could be given.

The irony in pleoptics is that it is not effective above 5 years, but patient cannot cooperate below 5 years - especially appreciation of negative after image.

Orthoptics

Orthoptics: Orthoptic exercises yield good results only when they are carried out along with other modalities. Orthoptics in heterophoria were useful and yields good result especially in convergence insufficiency.^{7,12} Home exercises are rewarding as it involves the patient and parents and avoids multiple trips to the hospital.

In this study of 50 cases, the most glaring facts are

- Late age of diagnosis-due to late presentation.
- Uniocular aphakia - contact lenses could not be prescribed immediately.
- Parents were anxious about only motor orthophoria and not sensory orthophoria.
- Relaxed attitude towards orthoptics.
- Sensory adaptations were well established by the time patient reached the hospital.

CONCLUSION

This study brings to light the following points: Importance of early detection and early treatment of squint should be emphasised. Parents should be made to understand that in a squint eye, vision will be reduced if early treatment is not initiated.

The latest non-surgical modality of Botulinum toxin was not tried in this study.

The following are the Conclusions

- Though deviation of eyes were noticed at birth, the patient was brought only much later to the hospital.
- 36% were brought to hospital between 1 and 10 years; 42% between 11 and 20 years; 22% after 20 years. This gives an indication that success rate i.e.

attainment of sensory orthotropia is going to be very poor. Most of the cases turned out to be cosmetic motor orthotropia only.

3. Accommodative esotropias showed excellent improvement with spectacles.
4. Exophorias of convergence insufficiency responded very well to orthoptics, refractive errors were corrected with spectacles.
5. Anisometropic amblyopia – uniocular aphakia - operated without exodeviation responded well and had a good amount of fusion.
Anisometropic Myopia - responded well to spectacles and or contact lenses.
6. Prisms were only of limited use.
7. Conventional occlusion and pleoptics were only academic exercises since patients were 8 years and above.
8. Exophorias – responded moderately to orthoptics.
9. Alternators responded better than uniocular.
10. Post-operative orthoptics results were better, may be because after surgery patients come for followup regularly.

So, early detection and early therapy is an important criterion to establish binocular single vision. Intense education of parents, paramedical persons is necessary to acquire binocular single vision in concomitant squints.

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