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Proportion of Squint in Neurodevelopmental Disorders among Children

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Purpose: To determine the proportion of squint in children having neurodevelopmental disorders and also to determine the proportion of strabismic amblyopia in these children.

Methods: Eighty children having neurodevelopmental disorders from 5-15 years were included from two institutes of mentally delayed children. It was a cross-sectional study & data was collected to determine the proportion of children having squint.

Results: Out of eighty children , thirty four (42.5%) were esotropic and twenty (25%) were exotropic which shows there is high prevalence of esotrpia then exotropia .Of these 28.75% had poor vision while 11.5% had esotropic amblyopia and 10% had exotropic amblyopia.

Conclusion: The proportion of squint among mentally delayed children is quite high and of these, percentage of esotropia is higher as compared to that of exotropia. This indicates that early detection of squint and proper vision screening should be done in this group of children because they can lead to amblyopia and blindness which can effect their learning and communication skills.

Introduction:

Squint is misalignment of visual axis or an impairment of binocular single vision. It may be broadly classified into **Phorias** which is latent deviation in which fusional control is always present and **Tropias** which is manifest deviation in which fusional control is not present. The deviations are described as Horizontal, Verical and Torsional.

Horizontal deviations are:

Esodeviation: The eye is deviated in a manner that cornea is rotated nasally and the fovea is rotated temporally.

Exodeviation: The eye is deviated in such a manner that the cornea is rotated temporally, while the fovea is rotated nasally.

Vertical deviations are:

Hyperdeviation: The eye is deviated so that the cornea is deviated inferiorly and the fovea is rotated upwards.
Hypodeviation: Conversely, the eye is deviated so that the cornea is deviated upwards and the fovea is rotated downwards

Torsional deviations can be:

Excylodeviation: The eye is rotated so that superior portion of the vertical meridian (12 o'clock) is rotated temporally and inferior portion of the vertical meridian (6 o'clock) is rotated nasally.

Incyclodeviation: Here the eye is rotated in a manner that superior portion of the vertical meridian (12 o'clock) is rotated nasally and inferior portion of the vertical meridian (6 o'clock) is rotated temporally.[1]

Neurodevelopmental disorders are disorders in the functioning of brain of a child affecting his/her behavior, memory or learning ability e.g. mental retardation, dyslexia, attention deficit hyperactivity disorder (ADHD), learning deficits and autism. Neuro-developmental behavioral disorders occur commonly in learning disabilities, developmental delay, attention deficit hyperactivity disorder, autism, reduced intelligence quotient and cerebral palsy. In Aboriginal children, the prevalence is often much higher. Some cases are linked to identified exposures, e.g. fetal alcohol, tobacco smoke, low birth weight and obstetric complications, chromosomal abnormalities, e.g. trisomy 21, Down's syndrome.[2] Many chemical exposures have also been investigated e.g. tobacco smoke, lead and mercury. Prenatal and early childhood offers windows of vulnerability for adverse effects on healthy neuro-development (chromosomes 6, 15) are linked with reading disability.[3] American Association of Mental Retardation has described the ranges of these disorders[4] as given in Table 1

Class	IQ
Profound mental retardation	Below 20
Severe mental retardation	20 – 34
Moderate mental retardation	35 – 49
Mild mental retardation	50 – 69

These ranges are based on Standard Scores of intelligence tests, the Diagnostic and Statistical Manual of Mental Disorders-IV-TR, and the International Classification of Diseases-

Aims and objectives:

1. To determine most common type of squint in children having neurodevelopmental disorders.
2. To determine gender distribution of squint in children having neurodevelopmental disorders.
3. To find out prevalence of strabismus amblyopia in these children.

Materials and Methods:

Study design: Descriptive cross sectional study.

- Inclusion criteria:
- Children who had neurodevelopmental disorders age from 5-15yrs.
- Male and female both included.

Exclusion criteria:
Non cooperative children
Sample size: 80 patients 60 males and 20 females were included.

Results:

Table 2

Squint	Frequency	Percent
Esotropia	34	42.5
Exotropia	20	25
Orthophoric	26	32.5
Total	80	100

The table above shows that esotropia was more common type of squint present in these children.

Table 3

Vision	Frequency	Percent
3/3 -3/19	23	28.8
3/12 -3/7.5	18	33.8
3/6 -3/3	27	15
Total	80	100

This table shows that out of 80, 28.75% had poor vision.

Table 4

Esotropic amblyopia	11.5%
Exotropic amblyopia	15%

This table shows that out of 80, 11.5% had esotropic amblyopia and 15% had exotropic amblyopia

Discussion:

The importance of vision in the acquisition of certain basic and complicated skills e.g. communication (language and interpreting facial expressions), and hand–eye coordination requiring skills cannot be over-emphasized. In the absence of a good vision at age of about 10 – 12 years or thereafter, the adaptability of the visual system to new stimuli is hampered limiting the recovery of good vision. This makes the learning and development in these children very difficult especially during processes that require making informed choices and learning from their surroundings. If more than one disability is present, the suffering and the handicap tend to have a multiplied effect rather than just summing up. These children have a normal physical growth but a decreased mental growth. Ocular abnormalities are more common in mentally retarded than general population. These defects include refractive errors, squint, nystagmus, microphthalmos, corneal abnormalities and retinal detachments.[5]

Eyecare professionals can examine young children (including infants and toddlers) quite comfortably, but sometimes find it challenging to examine an intellectually handicapped child. They must treat these children according to their mental and not physical age. The primary objective should be improvement of the visual status of these special children which could improve their development. It also goes without saying that visual examination of all such children should also be carried out annually similar for those in normal schools.

Detection of a congenital cataract soon after birth as well as complications of other disorders should help to prevent blindness. Visual perception is especially important for mentally handicapped to communicate and move about. A high prevalence of ocular problems was seen in mentally retarded school children. Children with mental retardation should undergo annual ophthalmological check up. Early detection and correction of ocular problems will prevent visual impairment in future. The prevalence of refractive errors and strabismus has been found to be significantly higher in the mentally handicapped than those expected in a non-handicapped population.[6] For example the prevalence of strabismus was 46.4% of which 20% had exotropia and 26.2% esotropia. Another study showed that prevalence of esotropia in 83 children was 54% and exotropia 40%.[7]

Conclusion:

According to my study 34 out of 80 (42.5%) had esotropia and 20 (25%) had exotropia. So my results are close to the previous studies which showed that prevalence of esotropia is high in mentally delayed children along with other ocular defects and that these ocular defects and amblyopia should be treated in visual plastic period.

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