



STUDY OF AUDITORY REACTION TIME IN SEVERITY OF AUTISM

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ABSTRACT

Sample of 30 autistic children, in the age group 2-8 years were studied for evaluating auditory Reaction time with severity. Severity was measured by CARS Scale and using CARS score, autism is of mild, moderate and severe type.

KEYWORDS : autism, auditory reaction time.

INTRODUCTION

Autism spectrum disorders (ASD) are developmental disorders that include autism, Asperger's disorder, and pervasive developmental disorder. ASD are defined by a triad of deficits:

1. language impairment in social communication
2. repetitive or stereotyped behaviors or interests
3. Impaired social interactions[1]

Infantile autism was described for first time by Leo Kanner as autistic disturbances of affective Contact[2] Genetic variation, environmental exposure, and prematurity are supposed to be etiologies contributing to autism spectrum disorder.[3] Incidence of autism has dramatically risen from 2–5 per 10,000 to approximately 1–2 per 1,000 children [4] Reaction time is the time interval between the application of stimulus and appearance of appropriate voluntary response by a subject. It involves stimulus processing, decision making and response programming. Reaction time is found to be altered by a number of factors both physiological and pharmacological.[5,6] Evaluation of the processing speed of central nervous system and the coordination between the sensory and motor systems is done by reaction time test.[7] Reaction time measurement is a sensitive and reproducible test and it requires simple set up and simple apparatus. It is an inexpensive means for determination of sensory motor performance of person.[8]

MATERIAL AND METHOD The study included 30 autistic children from "Arambh" autistic school in the age group 5 to 10 years were taken. auditory reaction time was measured in government medical college, Aurangabad.

METHODOLOGY

After obtaining ethical clearance, a proper written informed consent was taken from the parents of autistic children. The procedure was explained and trial was given before taking the reading. Auditory reaction time was determined by using an instrument reaction time apparatus designed by Anand agency, Pune All the tests were done in a quiet room temperature of 27°C. For auditory reaction time, stimulus was given in the form of beep. In built digital chronoscope is present on examiners side to measure the reaction time in milliseconds. An average of three readings was taken. The data was statistically analyzed by using ANOVA test.

OBSERVATION TABLE

Score of autistic children was calculated using CARS scale and classification was done According to childhood autism rate scale, autistic children who are having CARS score less Than 30 are considered to be mild type, moderate are those having score between 30-60. And severe autistic have score more than 60.

OBSERVATION TABLE

	MEAN + - SD	F - VALUE	P -VALUE
MILD	2.21+ _ 0,62		

MODERATE	3.58 +_ 0.45	69.11	P< 0.0001
SEVERE	4.94 +_ 0.62		SIGNIFICANT

DISCUSSION

In autistic individuals, slower processing of auditory stimuli causes longer reaction time responses.[9] It was found that in autistic children have abnormalities in initial auditory cortical processing.[10] Bruneau and colleagues found abnormalities of N1b and N1c of auditory evoked potentials which is fronto-central and Temporal component was diminished in autistic group. N1 peak amplitude increased with Increasing intensities, but in autistic group, this effect was present on right side, which suggests a right hemispheric dominance in auditory processing in autistic individuals.[11]

Dysfunction at the level of auditory association cortex, superior temporal gyrus, superior temporal sulcus are important for auditory processing, which was shown by Bonnet–Brilhault. [12].

Event related field maturational pattern of lateralization was investigated by Flag ,Oram Cardy ,Roberts and Roberts, in autistic children and found reversed maturational pattern Of lateralization.[13]

Position emission tomography studies have found right hemispheric dominance of auditory Processing in ASD individuals.[14] Abnormal development of temporal lobe areas changes auditory and speech sound processing.[15,16,17,]

Maziade et al reported prolongation of an brainstem auditory evoked responses in autistic Disorder children and suggested that slowing may be due to abnormalities in myelination Process during development.[18]

In autistic children, slower reaction time may be due to defects in the perceptual motor process. Deficits in the perceptual motor process may be the cause of slower reaction time in autistic children.

CONCLUSION

Demyelination of auditory nerve fibers ,abnormalities in myelination processes during development defect in auditory processing might be responsible for prolongation in reaction time in severe type autism, as compare to mild and moderate type.

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