

STUDY OF VISUAL REACTION TIME IN AUTISM

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Abstract

The present study was carried out to assess visual system in autistic children. Twenty subjects were selected as subject group. Age group of children was 10 – 15 years. Visual tasks were performed on Reaction time apparatus. visual reaction time is prolonged in autistic children.

Keywords:

autistic children, visual reaction time .

Introduction

Autism spectrum disorders are defined clinically by impairment in communication, social interaction, and behavioral flexibility.¹ Infantile autism was described for first time by Leo Kenner as autistic disturbances of affective contact.² For infants, visual orienting is the primary means of exploring the world. The efficiency of orientation undergoes developments in the first years of life, including capacity to disengage attention & look away from salient stimuli imaging on fovea.³ Individuals with autism have a narrow focus of attention & interest, as well as acute perception of details.⁴ Several studies have suggested that task dependent difficulties in visual attention are present in autism across the life span in adults; these difficulties are repeated in tasks requiring rapid shifting of attention to different spatial locations.⁵ Development accounts would suggest that problems in visual orienting are likely to be present very early on in autism.⁶ Reaction time has physiological significance and is simple and non invasive test to see peripheral as well as central neural structures. The reaction time is an indirect index of processing capability of central nervous system and also a simple means for sensory and motor performance. The time interval between the application of stimulus and appearance of voluntary response by a subject is defined as reaction time. It involves stimulus processing, and response programming. Therefore, study to see the effect of visual reaction time in autism children.

Materials and methods

The present study was conducted in Dept. of Physiology, MGM'S Medical College, Aurangabad included 20 autistic children from 'arambh' autistic school and 20 normal children in the age group 10 to 15 years were taken for the control match.

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. was determined by using an instrument reaction time apparatus designed by Anand agency, Pune. All the tests were done in a quiet room at room temperature of 27C. For visual reaction time, stimulus was given in the form of beeping tone and click. 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 students paired 't' test.

Result

Table 1: Showing mean value and SD of Visual reaction time (msec) in autism and control Reaction time

		Mean ± Sd	t-value	p-value
Visual reaction time	Autistic	2.47 ± 0.79	12.4	P=0.0001
	Non-autistic	0.26 ± 0.067		significant

Table 2. showing mean age and percentage of male female ratio of autism

Sex	Mean age	N(total=20)	Percentage
Male	11.5 years	17	85%
Female	11.5 years	13	15%

Discussion

Our study showed statistically significant prolongation of visual reaction time as compared to healthy age match controls. It has also been hypothesized that the cerebellum, a structure that shows significant changes in neuronal density in autism may play a role in impaired sensory integration in autism. This mediation occur through atypical filtering of afferent inputs, although the exact mechanisms is unclear⁷ However, others propose that as sensory integration is dependent on the rapid exchange of information between distinct cortical and sub cortical regions, disruptions in connectivity likely play the causative role.⁸ Infant siblings of autism showed longer disengagement latencies as well as less facilitation relative to the control group. Some have suggested that early impairments in disengagement of visual attention may relate to the social communicative deficits found in autism.⁹ Early deficit in social orienting, resulting in decreased input from socially relevant stimuli, may underlie the emergence of autism symptoms.¹⁰ All physiological responses are controlled by the the autonomic nervous system which includes both the sympathetic and parasympathetic nervous system. Both systems, which are controlled by lower parts of the brain thought to be out of balance in some children with autism.¹¹ Gowen and Hamilton propose that motor problems in autistic spectrum involve perceptual inputs and are related to poor higher order sensorimotor integration, resulting in the slow planning of movements.¹²

Conclusion

Visual reaction time was prolonged in autistic children as compared to control. Visual reaction time is a simple physiological parameter to study neurophysiologic processing in autism. Due to decreased input from stimuli and prolonged disengagement which is related to visual attention there may be difference in visual reaction time. We suggest that differences in sensory processing actually causes core features of autism such as difficulty with reading emotion from faces. However further study is required in this field.

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