

Early detection of autism – comparison of two screening tools

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Abstract

Introduction: The aim of the study was comparison of a newly developed test Trivandrum Autism behaviour checklist with gold standard test, CHAT. **Method:** The present study was done in pediatric OPD (Bundelkhand Medical College, Sagar, (MP). The study was done in the children of 24 to 36 month of age over a period of one year. The study including sex, age of the father & mother, education of father & mother, place of residence, antenatal history, natal & neonatal history, immunization history, developmental history and also two tools – CHAT & TABC. **Result:** There are many factors taken during study but there is relation between these factors and Autism. However, Autism is more common in age group of 21 to 30 month of age and also common in male than female. It is more common in urban areas. It is shown that the Birth weight of babies were 2.5 to 3.00kg. The incidence is also high in immunized children. There is no relation with age and education of the parents, Antenatal History, Developmental history. In present study, the maximum no. of cases were screened by CHAT test (28 case) while 11 cases by TABC case. However, 11 cases were screen by both CHAT and TABC. In study sensitivity of the TABC (Trivandrum Autism behaviour checklist) 39.2 it is low, hence TABC is not good test for screening. Specificity 99.4 it is high, hence TABC is good test for diagnosis or confirmatory test. **Conclusion:** It is shown that chat is a good test for screening of Autism then TABC. The TABC is good test for the diagnosis or confirmation of the disease.

Key words - CHAT test, TABC (Trivandrum Autism behaviour checklist) test, Autism

Introduction

Autism is a developmental disorder that appears in first three years of life and is characterized by impaired social communication and interaction. Autism is also characterized by restricted and repetitive behaviour. It is also called as pervasive developmental disorder. Fombonne E et al study shows the prevalence to be 0.9/1000 with highest prevalence rate in rural areas [1]. Studies conducted across the world have shown that the cases of autism have increased from 50% to 2000% [2]. This number could have increased partly due to improvement in awareness and clinical practice [3]. The exact cause of autism is unknown. Autism is linked to genetic predisposition and also to

infections occurring during prenatal, perinatal or postnatal phases [4-7]. Certain environmental factors could also act as trigger. Siblings of children with autism are at a higher risk of developing autism. Drugs like thalidomide and valproic acid taken during pregnancy are believed to be risk factors for autism [8,9]. High parental age is also believed to be one of the risk factors [10]. Despite profound research the pathophysiology of autism is still not well understood. There is alteration of brain system and this is believed to occur immediately after conception [11].

Several screening tools have been developed for successful diagnosis of autism. Adequate use of these tools requires training and experience. The signs and symptoms of the toddlers should be

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monitored for early diagnosis of autism. They primarily include impaired social interaction, language problems, repetitive behaviour, delayed developmental milestones, absent protodeclarative pointing and history of frequent infections. There is no known cure. These children can benefit with speech and behavioural interventions if started at early stage.

The prognosis of patients with autism is dependent on their intelligence quotient (IQ). Patients with low functioning IQ may find it difficult to live independently throughout their entire life. Patients with high functioning IQ may be able to carry out their responsibilities independently and even progress in life.

Methodology

Aims- The aim of our study to publish is to diagnosed autism earlier as possible.

Objective: The object of this study is to identify autistic child as early as possible by chat & TABC. To compare the two test (CHAT & TABC) to diagnose the autism as earlier as possible.

Type of study- It is cross sectional case study.

Sample collection- These children are coming from Sagar Division MP as well as U.P., Chattishgarh and Maharashtra in OPD of Bundelkhand Medical College, Sagar (MP)

Sampling method- Patients were interrogated in the Bundelkhand Medical College, Sagar for any signs of autism.

Inclusion Criteria- Normal Children from 24 to 36 months in age coming in OPD

Exclusion Criteria- Cerebral palsy, Global Developmental delay patients

Duration study- one year.

Present study was done in pediatrics O.P.D. in Bundelkhand Medical College, Sagar (M.P.). We have taken children of 24-36 months age group. There is no difference on the basis of sex, religion and education. We have compare these babies with CHAT screen and TABC score. We have examine children in following orders. - age, sex, Birth order, Place of Residence, Age of the father & mother, Presenting Complaints, Antenatal History, Natal & Neonatal History, Immunization History, Developmental History.

Tools- CHAT (Check list for Autism Toddlers) Research Centre at the University of Cambridge

Questions for the parents

1. Does your child ever pretend, for example to make a cup of tea by using a toy cup and teapot or pretend other things?
2. Does your child ever use his or her index finger to point, to indicate interest in something?
3. Does your child take an interest in other children?
4. Does your children enjoy playing peek-a-boo or hide-and-seek?
5. Does your child ever bring objects over to you to show you something?

[If the answer to two or more of the above is "No" than autism is suspected (except in the presence of server generalized developed delays)]

Physicians' observation

1. During the appointment, has the child made eye contact with you?
2. Get the child's attention, then point across the room at an interesting object and say "Oh look! There's a (name object)". Watch the child's face. Does the child look across to see what you are pointing at?
3. Get the child's attention, the give the child a miniature toy cup and teapot and say, "Can you make a cup of tea? "Does the child pretend to pour out tea, drink it, etc? (May use other objects for pretend play).
4. Say to the child, "Where's the light? or "Show me the light" does the child point with his or her index finger at the light?

[If the answer to two or more of the above is, "No" autism is suspected].

Trivandrum Autism Behavioural Checklist, Child Development Centre Trivandrum (TABC)

I. Social Interaction

- a. Inability to establish and/or maintain eye contact.
- b. Child does not respond when called, sometimes appear to be deaf.
- c. Difficulty in mixing and praying with other children of same age.
- d. Lack of appropriate emotional responses.
- e. Can do certain tasks well, but not the tasks involving social understanding.

II. Communication

- a. Difficulty in comprehension/communication.
- b. May/May not indicate needs by gestures or leading adults by the hand.
- c. Echolalia/using nonsensical words and muttering to self.
- d. Lack of pretend play.

III. Behavioral Characteristics

- a. Like sameness in every day routine.
- b. Inappropriate attachment to objects.
- c. Unusual body movement such as flapping hands, or rocking and jumping.
- d. Extreme restlessness, hyperactivity over passivity or prefers to be alone all the time.
- e. Not responsive to normal teaching methods.

IV. Sensory Integration

- a. Doesn't like to be hugged or touch/Apparent insensitivity to pain.
- b. Intolerance/Addition to certain sounds, tastes, odours, visuals.
- c. No understanding or fear of real dangers/excessive fear for heights, changes in position.
- d. Enjoy spinning or rotating objects.

- e. Inappropriate laughing and giggling/Crying spells with extreme distress for no apparent reasons.
- f. Difficulty in fine motor skills/a tendency to fall/clumsiness/ resistance to new motor movement activities.

Note: Scoring is done by asking these various questions in all four headings and totaling is done. In each case.

1. Never 1 marks (Nil)
2. Sometimes – 2 (Less than 50%).
3. Often – 3 (More than 50%)
4. Always – 4 (More than 90%).

Calculations of scoring

1. 20-35 scoring – no autism
2. 36-43 likely autism
3. 44 and above severe autism.

Analysis of Data- By gold standard test – calculated sensitivity, specificity, positive predictive value, negative predicative value, likely hood ratio – positive & negative, Accuracy, prevalence, odds, probability.

Observation**Table-1: Age of children.**

Age group	No. of child
24-30 Month	118 (58.70%)
31-36 Month	83 (41.29%)
Total	201

Out of 201, 118(58.70) children were 24-30 month of age group 83(41.29%) child were 31-36 month of age group.

Table-2: Birth Weight.

Name	No. of cases
1-1.5 kg	0 (0%)
1.5 to 2.5 kg	45 (22.38%)
2.5 to 3.0 kg	110 (54.71%)
3.0 to 3.8 kg	46 (22.88%)
Total	201

Most of babies birth weight was in 2.5 – 3 Kg. (110, followed by 3-3.5 kg. (46), 1.9-2.5 kg. (45) and no case in 1-1.5 kg birth weight.

Table-3: Checklist of Autism in Toddlers (CHAT).

Question Parents		Physicians Obs.		Both
1	128 (63.68%)	1	49 (24.37%)	
2	18 (8.99%)	2	34 (26.91%)	
3	1 (.49%)	3	10 (4.97%)	
4	2 (.99%)	4	3 (1.49%)	
5 (No)	52 (25.87%)		105 (52.23%)	
				13.93%

Out of 201, no symptoms were reported in 52 cases, one symptoms reported in 128 cases and 2 symptoms were reported in 18 cases and 3 symptoms reported in one case only and 4 symptoms reported in 2 cases.

Table-4: Trivandrum Autism Behavioural Checklist (TABC).

Score	No Autism	Likely Autism	Severe Autism
20-35	190 (94.52%)		
36-43		9 (4.47%)	
44- above			2 (.99%)
Total	190 (94.52%)	9 (4.47%)	2 (.99%)

Out of 201, 191 cases have no autism, 8 cases have likely autism and 2 cases have severe autism.

Table- 5: Results of Study.

	Chat	TABC	Both Chat+TABC
Positive	28 (13.93%)	11 (5.47%)	11(5.47%)
Negative	173 (86.06%)	190 (94.52%)	190 (94.52%)
Total	201	201	201

Table shows 28 cases were screen by chat while 11 cases by TABC. In both tools 11 cases were positive.

Table- 6: Analysis of Data.

Specificity		Sensitivity	
CHAT	TABS	CHAT	TABS
99.4	99.99	39.2	18.18

Specificity for chat was 99.4% while TABS had 99.9%. Sensitivity for chat was 39.2% while 18.18% were for TABS.

Discussion

The Trivandrum Autism Behavioral Checklist TABC test is one simple tool developed by the Child development centre, Medical College, Thiruvanthapuram, India which has been found to be equally good to screen the children for Autism. As per our study the frequency of occurrence of Autism is 1.5%. More and more children are currently being diagnosed for Autism then before.

In present study, out of 201 children of 24-36 months, it shows the autism is more common in the age group of 24-30 months (58.70%). The forborne also reported 57.91 cases [1]. In present study, it shows that autism in more common in male (55.72%) than female children (44.27%). This is because of male babies suffer more than female children naturally. In present study, most of the

babies (87.56%) delivered with mothers age group of 21-30 years of age as also reported by Di martino A et al [2]. In present study, out of 201 most of the father came in the age group of 21-30 years of age (66.16%) cases followed by 31-35 years of age (17.91%) as reported by Jin [3].

In present study, out of 201 children, higher children came in the birth order of II (48.7%) as compared with 49% as reported by HAS [4] followed by birth order 41.29% and birth order III (8.9%). In present study out of 201, most of the father (63.18% cases) were educated, as 9.45% father were schooled up to primary level, 24.87% father were studied up to high school and 25.37% had degree in various subjects as also reported by crespini B et al [5]. In present studies, out of 201, most of the children belonged to urban area (52.36%). Children came from villages were 47.26% as also reported by Reichow B [6].

Out of 201 mother, 98.50% mother have no positive antenatal history. 1.49% mothers had infection during pregnancy as also reported by Patterson et al [7]. In present study, out of 201, most of babies were in the age group of 2.5-3.4kg weight group (54.72%). It is followed by 3.00 Kg – above (22.8%), similar findings were also reported by Rossignol DA et al [8].

In present study, out of 201 children, babies receive no vaccine were 27.36% cases. 4.97% child received only 1 dose of DPT & OPV while 7.46% children received only 2 doses DPT & OPV. 16.41% cases received 3 doses of DPT & OPV. 16.14% children received only measles vaccines & 83.55% did not receive measles vaccine. 16.41% babies also received MMR vaccine. While 83.55% not received MMR as reported by Doja A et al [9].

In present study it has been divided into two parts. Part 1 comprises of asking questions from the parents and the direct observations of child by physician. In study 25.87% parents giving answer of questions – YES, 63.68% parents giving answer of one question – NO, 8.91% parents giving answer of two questions – NO, 0.49% parents giving answer of three questions – NO, 0.99% parents giving answer of four questions – NO

In present study, in 52.73% children physician observation were – YES. 24.37% children physician observation were – No only in one observation.

16.91% children physician observation were – No only in two observations. 4.97% children physician observation were – No only in three observations. 1.49% children physician observation were – No only in four observations. Total cases detected are 13.93% as reported by Baird et al [10].

In present study, 94.52% babies did not have any symptoms and sign of autism, 4.47% babies have likely autism and .99% have autism. Similar findings were reported by Biever et al [11] while 11 cases were detected by both tests.

Conclusion

In present study, the maximum no. of cases were screened by CHAT test (28 cases) while 11 cases by TABC case. However, 11 cases were screened by both CHAT and TABC. In study sensitivity of the test 39.2 it is low, hence TABC is not good test for screening. Specificity 99.4 it is high, hence TABC is good test for diagnosis or confirmatory test. I concluded, it is shown that CHAT is a good test for screening of Autism then TABC. The TABC is good test for the diagnosis or confirmation of the disease.

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