

Screening for Autism, Agreement with Diagnosis

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Background: Early diagnosis of Autism would facilitate access to evidence-based intervention that can significantly improve the outcomes in children with Autism. To make early identification easier to achieve valid screening diagnostic instruments are needed that are, ideally, simple and brief, a cost effective to administer. The screening or diagnostic tools need to be accurate when completed by both clinicians and parents, appropriate for toddlers as well as older children, and designed for individuals at both the low and high ends of the autism spectrum. The field of Autism has recently seen the introduction of a range of new instruments and a high degree of agreement between the various assessment procedures. The clinical diagnoses by experienced professionals would provide evidence supporting the instruments' diagnostic utility with clinical populations. Little research has been conducted comparing M-CHAT with other recognized measures such as Gilliam autism rating scale (GARS). Continued research on the relationship between the GARS and clinical diagnoses is needed.

Objective: Therefore the aim of the study was to find out the diagnostic agreement and positive predictive value of M-CHAT with GARS -2

Methodology:

Research Design: A retrospective study design was adopted. The study was conducted as per the declaration of Helsinki guidelines.

Participants: Participants included 110 children between the age of 3 years and 10 years (mean = 4.2, SD = 1.89) who received diagnostic assessments at the paediatric unit for the assessment of Autism in a tertiary hospital setting from the year 2016 to 2017. The sample had 82 percent male from the city of Coimbatore, Erode, Tirupur, Salem. Children who were at risk for Autism on the M-Chat and on whom GARS-2 was administered were included in the study. Children with other developmental disabilities and comorbid disorders were excluded.

Measures: Modified Checklist for Autism in Toddlers- The M-CHAT (Robins et al. 1999; Robins et al. 2001) is a 23-item yes/no parent report checklist. It is an adaptation of the CHAT (Baron-Cohen et al. 1996) designed for the American healthcare system, eliminating the observation section and expanding parent report items. The M-CHAT is validated for screening toddlers between 16 and 30 months of age, to assess risk for autism spectrum disorders (ASD). The M-CHAT has a sensitivity of 0.87, specificity of 0.99, positive predictive power of 0.80, and negative predictive power of 0.99.

Gilliam Autism Rating Scale-2 (GARS-2) -The GARS is a 42-item parent report behavior checklist intended to help identify children who have a high likelihood of autism (Gilliam, 1995).

Each subtest raw score is converted to a standard score with a mean of 100 and a percentile rank. In addition, subtests are summed to generate an overall GARS total score which is converted into a standardized ‘autism quotient’ and overall percentile rank. Gilliam (1995) reported internal consistency coefficients for the subtests in the 0.80s and 0.90s and test–retest and interrater reliability well within acceptable ranges.

Procedure: Review of scores of M-CHAT and GARS -2 and sociodemographic data was collected from each child’s medical record. MCHAT and GARS-2 were reviewed and compared for analysis. For analysis the children were divided into 4 age groups – A 3-4 yrs , B 5-6 yrs, C 7-8yrs, D 9-10yrs.

Result:Statistical analysis was done using SPSS version 20. Descriptive statistics was used to analyze the demographic details and the measurement tools. Pearson’s correlation was used to find correlation between M-CHAT and GARS-2. Chi square analysis was done to compare the scores of M-CHAT and GARS-2, to find screen positive and negative cases with likely, unlikely of Autism.Calculations of Positive Predictive value, Negative predictive value, Specificity, Sensitivity and overall percentage agreement were also done.

Table 1: Shows Sensitivity, Specificity, PPV, and NPV of Modified Checklist for Autism in

Instrument	Sensitivity	Specificity	Positive Predictive value (PPV)	Negative Predictive Value(NPV)	Overall percentage agreement
MCHAT	90.72%	38.46%	91.67%	35.71%	84.5%

Toddlers with GARS-2.

The above table shows that M-CHAT and GARS-2 had an overall diagnostic agreement of 84.5%.It was found that M-CHAT and GARS -2 had a positive predictive value of 91.7% , Negative predictive value of 35.71% , specificity of 38.4% and sensitivity of 90.7%.

Table 2. Comparison between M-CHAT and GARS-2 screen positives and screen negatives.

	N	Percentage	X ²	P
Screened+ve(M-CHAT)				
Likely (GARS)	88	91.7	338.136	0.367
Screened -ve(MCHAT)				
Likely(GARS)	9	9.4	11.62	0.476

Screened +ve(MCHAT)				
Unlikely(GARS)	8	8.3	18.00	0.324
Screened -ve(MCHAT)				
Unlikely(GARS)	5	5.2	10.00	0.265

Table 2 shows there was no statistically significant difference between the scores of M-CHAT and GARS-2 on Chi-square analysis($X^2=336.13, p=0.367$), screened negative with likely of autism($X^2=11.62, p=0.476$), screened negative with unlikely of autism ($X^2=10.00, p=0.265$), screened positive with unlikely of autism($X^2=18, p=0.324$). This shows that both M-CHAT and GARS-2 are equally fit to identify children with ASD.

Conclusion: Results suggest that M-CHAT and GARS-2 continues to be an effective screening and diagnostic instrument for ASD. Screening and diagnosing with the M-CHAT and GARS-2 has the potential to greatly reduce the age of diagnosis and optimize long-term prognosis. Administering these instruments as a standard practice will help in early identification and early start on effective therapies.

Keywords: Autism, M-CHAT, GARS-2, Diagnostic agreement, Positive predictive value, Sensitivity