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A Study On Screening Of Autism Spectrum Disorder Among Toddlers Using M-Chat-R Scales

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Abstract

Background: Autism spectrum disorder (ASD) is a group of heterogeneous neurodevelopmental disorders, which are characterized by deficits in social communication and interaction, and restricted and repetitive patterns of behaviors, Diagnostic and Statistical Manual of mental disorders (DSM-V) defines a patient with autism spectrum disorders as having persistent deficits in social communication and social interaction which encompass deficits in social-emotional reciprocity, deficits in non-verbal communicative behaviors used for social interaction, and deficits in developing and understanding relationships**.**

Aim Of The Study: To study the early diagnosis of autism spectrum disorder in toddlers using M-CHAT-R scales. To study the factors that influence autism like exclusive breastfeeding, and immunization.

Methods: This cross-sectional study. Consecutive children who were between 16 months and -24 months of age attending Pediatric OP Department Of Paediatrics, Government Medical College, Karur. were assessed for Autism using the M-CHAT-R scale. Study period one year. Of these children evaluated during the study period, 522 children met the inclusion criteria. Parents of 3 children didn't consent to the study and 17 children had a co-morbid neurological illness and were excluded. Hence, the study was conducted in a sample of 502 children-which comprises 275 males and 227 female children.

Results: The prevalence of Autism Spectrum Disorder among my study population is 1 in 100. The mean age of early symptom identification is 22.80 months average of 20 – 24 months. Male children are more affected than female children Male: Female = 4:1. Preterm-delivered children are more affected than term gestation-delivered children. LSCS-delivered children are more affected than labor-natural-delivered children. Exclusively breastfed children are less likely affected than suboptimal breastfed children. Partially immunized children are affected significantly more than fully immunized children.

Conclusion: There is an increasing trend of ASD in the general population. Early identification and early intervention help the affected children to live an optimal life. Improve prenatal and perinatal care. Create awareness about exclusive breastfeeding and full immunization in the general population.

Keywords: ASD, Gender difference, Exclusive breast feed

Introduction

Childhood Autism belongs to the group of Pervasive Developmental Disorders, which are neurodevelopment syndromes characterized by impairment in reciprocal social interaction, impairment in communication, restricted repetitive and stereotyped patterns of behavior, interests, and activities.1Diagnostic and Statistical Manual of

mental disorders (DSM-V) defines the patient with autism spectrum disorders as having persistent deficits in social communication and social interaction which encompass deficits in social-emotional reciprocity, deficits in non-verbal communicative behaviors used for social interaction, and deficits in developing and understanding relationships. There is a rising trend in the prevalence of Autism Spectrum disorder worldwide from 0.5% to 1%.2 A recent systematic review in India and other south East Asia populations has reported a prevalence rate ranging from 0.09% to 1.07% among children in the age group of 0–17 years with Autism Spectrum disorder As of now, Autism spectrum disorder considers a public health problem. Early detection and early intervention need in this area. M-CHAT-R Scale is used for screening Autism Spectrum Disorder in children aged 16 months to 30 months. It is a validated scale used for screening Autism spectrum disorder. 3 There are 20 Yes or No types of questions answered by parents. The questionnaire has been translated into the Tamil language. According to the response, marks were scored. Score <3 the screening was negative. If the child age < 24 months at the end of 24 months repeat the screening test. If the score is 3– 7 repeat the follow-up screening or refers to a psychiatrist for further screening. Score more than 8 directly send to a psychiatrist for treatment. 4 With the recent increase in the prevalence of ASD early identification and early intervention are needed. Early intervention provides optimal life for the affected individual and their family. 5We can identify as early as 24 months of life. Pediatricians can use M-CHAT- R scale for screening the child for ASD. The Pediatrician is the first contact medical person with the child. Pediatricians are responsible for the early identification of ASD and early referral to a psychiatrist for early intervention.6 Autism can easily diagnose as early as 24 months by using - the R scale. Early identification is important because early intervention gives the best opportunity to support the healthy development and life span of the child. The pediatrician is the first contact medical person to screen and refer the child to a psychiatrist for early intervention.7

Methods:

This cross-sectional study. Consecutive children who were between 16 months and -24 months of age attending Pediatric OP Department Of Paediatrics, Government Medical College, Karur. were assessed for Autism using the M-CHAT-R scale. Study period one year. Of these children evaluated during the study period, 522 children met the inclusion criteria. Parents of 3 children didn't consent to the study and 17 children had a co-morbid neurological illness and were excluded. Hence, the study was conducted in a sample of 502 children- which comprises 275 males and 227 female children. Parents/Caregivers of these children were explained about the study and informed consent was obtained from them. Semi-structured proforma is used to collect data regarding perinatal risk factors. Complete physical examination including neurological evaluation was done in those children.

Results

Table 1:Table Showing The Gender Distribution Of The Study Population

S.No	Gender	Frequency	Percentage
1	Male	275	54.8%

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2	Female	227	45.2%

Table 1 shows male children 275 percent of 54.8% and female children 227 Percentages of 45.2% in the study population.

Table 2: Table Showing The Gestational Age Of The Study Population.

S.No.	Gestational age	Frequency	Percentage
1	Preterm	85	16.9%
2	Term	416	82.9%
3	Post-term	1	0.2%

Table 2 shows the gestational age of the study population preterm 85 percentage of 16.9%, term 416 percentage of 82.9%, and post-term 1 percentage of 0.1%.

Table 3: Table Showing The Mode Of Delivery Of The Study Population

S.No.	Mode of Delivery	Frequency	Percentage
1	Lobar Natural	399	79.5%
2	LSCS	103	20.5%

Table 3 shows the mode of delivery, lobar natural 399 percentage of 79.5% and LSCS 103 percentage of 20.5% in the study population.

Table 4: Table Showing The Place Of Delivery Of The Study Population

S.No.	Place of Delivery	Frequency	Percentage
1	Government	434	86.5%
2	Private	68	13.5%

Table 4 shows the place of delivery in government hospitals 434 percent of 86.5% and Private hospital delivery children 68 percent of 13.5% in the study population.

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Table5: Showing The Breastfeeding Pattern Of The Study Population.

S.No.	Exclusive Breastfeed	Frequency	Percentage
1	Yes	454	90.4%
2	No	48	9.6%

Table 5 shows the Breastfeeding pattern, exclusively breastfed 454 percent of 90.4% And breastfed along with a top up breastfed 48 percent of 9.6%

Table 6: Table Showing The Immunization Pattern Of The Study Population.

S.No.	IMMUNIZATION	Frequency	Percentage
1	FULL	485	96.6%
2	PARTIAL	17	3.4%

Table 6 shows the immunization pattern of fully immunized 485 children percentage of 96.6% and partially immunized 17 children percentage of 3.4 % in the study population.

Table 7: Table Showing The Screening Positivity Of Asd Using M-Chat- R Scale In The Study Population

S.No.	SCREENING POSITIVE	Frequency	Percentage
1	NO	497	99.0%
2	MILD	4	0.8%
3	SEVERE	1	0.2%

Table 7 shows the screening results of the study population using the M-CHAT-R Scale.No ASD 497 percentage of 99%. The mild form of ASD 4 percentage of 0.8%.The severe form of ASD 1 percentage of 0.2%

Table 8: Table Shows The Positive Value Of Screening Among The Study Population With Gender Distribution. Screening Vs Gender

VARIABLE	NEGATIVE	POSITIVE	P VALUE

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GENDER	MALE	271(54.5%)	4(80%)	0.255
	FEMALE	226(45.5%)	1(20%)	

Table 8 shows the positivity and negativity of the screening test versus the gender distribution. Males were 4 screening positive percentage of 80 in total positive, screening negative was 271in the percentage of 54.5. Female was 1 screening positive percentage of 20 in total positive, screening negative was 226 with a percentage of 4.5. The p-value is 0.255 there is no statistically significant. So gender difference not affects the screening positively in my study population. The male and female ratio is 4:1.

Table 9: Table Shows The Positive Value Of Screening Among The Study Population With Mode Of Delivery Screening Vs Type Of Delivery

VARIABLE		NEGATIVE	POSITIVE	P VALUE
MODE OF DELIVERY	NVD	399(80.3%)	0(0.0%)	0.000
	LSCS	98(19.7%)	5(100%)	

Table 9 shows the positivity and negativity of the screening test versus the mode of delivery. Normal vaginal delivery was 0 positive percentage 0, screening negative was 399 in the percentage of 80.3. LSCS delivery. were 5 screening positive with a percentage of 100 in total positive, screening negative was 98 with a percentage of 19.7. P value is 0.000 there is much statistically significant. So the mode of delivery is much affect the screening positively in my study population.

Table 10: Table Shows The Positive Value Of Screening Among The Study Population With Place Of Delivery Screening Vs Place Of Delivery

VARIABLE		NEGATIVE	POSITIVE	P VALUE
PLACE OF DELIVERY	GOVERNMENT	429(86.3%)	5(100%)	0.374
	PRIVATE	68(13.7%)	0(0.0%)	

Table 10 shows the positivity and negativity of screening tests versus the place of delivery. Government hospital delivery was 5 screening positive of the percentage of 100 in total positive, and screening negative was 429 with a percentage of 86.3. Private hospital delivery was 0 screening positive percentage of 0, screening negative was 68 with a percentage of 13.7. The p-value is 0.374 there is no statistically significant. So the place of delivery did not affect the screening positively in my study population.

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Table 11: Table Shows The Positive Value Of Screening Among The Study Population With Immunization Status

Screening Vs Immunization Status.

VARIABLE		NEGATIVE	POSITIVE	P VALUE
IMMUNISATION	FULL	481(96.8%)	4(80%)	0.039
	PARTIAL	16(3.2%)	1(20%)	

Table 11 shows the positivity and negativity of screening tests versus immunization patterns in the study population. Fully immunized children were 4 positive percentages of 80 of total positive, screening negative was 481 in the percentage of 96.8. Partially immunized was 1 screening positive percentage of 20 in total positive, screening negative was 16 in the percentage of 3.2. The p-value is 0.039, which is statistically significant. So immunization status is affecting the screening positive in my study population.

Table 12: The Table Shows The Positive Value Of Screening Among The Study Population With Breastfeeding Screening Vs Breastfeeding

VARIABLE		NEGATIVE	POSITIVE	P VALUE
EXCLUSIVE BREASTFEEDING	YES	451(90.7%)	3(60%)	0.020
	NO	46(9.3%)	2(40%)	

Table 12 shows the positivity and negativity of screening tests versus breastfeeding patterns in the study population. Exclusively breastfed children were 3 positive percentages of 60 of total positive, screening negative was 451 in the percentage of 90.7. Breastfed along with a top-up fed were2 screening positive percentage of 40 of total positive, screening negative were 46 in the percentage of 9.3. The p-value is 0.020, which is statistically significant. So, Exclusive breastfeeding is affecting the screening positivity of my study population.

Table 13: Shows The Positive Value Of Screening Among The Study Population With Gestational Age Screening Vs Gestational Age

VARIABLE		NEGATIVE	POSITIVE	P VALUE
	PRETERM	81(16.3%)	4(80%)	
	TERM	415(83.5%)	1(20%)	

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GESTATIONAL AGE	POST TERM	1(0.2%)	0(0.0%)	0.001

Table 13 shows the positivity and negativity of screening tests versus gestational age in the study population. Preterm delivered children were 4 positive percentages of 80 of total positive, screening negative was 81 in the percentage of 16.3. Term delivered child was 1 screening positive of the percentage of 20 in total positive, screening negative was 415 in the percentage of 83.2. Post-term delivered child was 0 screening positive percentage 0, screening negative was 1 in the percentage of 0.2. The p-value is 0.001, which is statistically significant. So, gestational age is affecting the screening positive in my study population.

Table 14:Table Showing Age Distribution In The Screening Positivity Of Asd Using M-Chat- R Scale In The Study Population

SCREENING CATEGORY	MEAN AGE	RANGE
POSITIVE	22.80	20-24
NEGATIVE	20.03	16-26

The mean age of positive is 22.80 months range of 20 – 24 months in my study population.

Table 15: Table Showing The Screening Positivity Of Asd Using M-Chat- R Scale In The Study Population

S.No.	SCREENING TEST	Frequency	Percentage
1	NEGATIVE	497	99.0%
2	POSITIVE	5	1.0%

Table 15 shows screening tests for ASD 5 positive a percentage of 1% and 497 negatives a percentage of 99% among our study population of 502.

Discussion

An Indian study also shows a prevalence rate ranging from 0.09% to 1.07% among children in the age group of 0–17 years with Autism Spectrum Disorder. Gender distribution in my study male-female ratio is 4:1. Males were 4 screening positive a percentage of 80 in total positive, screening negative was 271 with a percentage of 54.5. Female was 1 screening positive with a percentage of 20 in total positive, screening negative were 226 with a percentage of 4.5.P value is 0.255 there is no statistically significant.[8] Other studies also show the same results autism is more common among male children with an M: F ratio of 4:1. Studies from clinical samples report a higher M: F ratio (4–6 to 1)while lower ratios (2–3 to 1) are reported in community samples. [9] According to DSM IV, ASD prevalence in gender distribution male and female ratio is 4:1.In the mode of delivery of my study population, Normal vaginal delivery was 0 positive percentage 0, and screening negative was 399 in the percentage of 80.3. LSCS

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delivery were 5 screening positive with a percentage of 100 in total positive, screening negative was 98 with a percentage of 19.7. P value is 0.000 there is much statistically significant. [10] Cesarean section mode of delivery much affects the screening positive in my study population. Some other studies also show cesarean section-delivered children have more effect on ASD than Normal vaginal-delivered children. [11]Cesarean sections delivered children were more prone to develop ASD due to most of the low birth weight and anomalies babies delivered by LSCS. Breastfeeding pattern children in my study population also affect screening positivity. Exclusively breastfed children were 3 positive percentages of 60 of total positive, screening negative was 451 in the percentage of 90.7. Breastfed along with a top-up fed were 2 screening positive of the percentage of 40 of total positive, screening negative was 46 in the percentage of 9.3. The p-value is 0.020, which is statistically significant. So, Exclusive breastfeeding is affecting the screening positivity of my study population. [12] Other studies also show exclusive breastfeeding significantly affects the prevalence of ASD. Indian Study Autism spectrum disorders are less common in exclusive breastfeeding in first 6 months children than compared to suboptimal exclusive breastfeeding children. Gut microflora acts as a pivot role in developing the immune system and neural development. The immunization pattern of the study population affects screening positivity.[13] Fully immunized children were 4 positive percentages of 80 of total positive, screening negative was 481 in the percentage of 96.8. Partially immunized was 1 screening positive percentage of 20 in total positive, screening negative was 16 with a percentage of 3.2. The p-value is 0.039, which is statistically significant. So immunization status is affecting the screening positive in my study population. [14] Previously public was fear of vaccination particularly MMR vaccination can cause ASD in the child. In my study partially immunized child significantly affected. Other studies show immunization particularly MMR not cause ASD. [15] The child has autism spectrum disorder their siblings were not received routine vaccination. There are more prone to vaccine-preventable diseases. There is no direct role of immunization in the Autism spectrum disorder of my study population affected the screening positivity. [16] Preterm delivered children were 4 positive percentages of 80 of total positive, screening negative was 81 in the percentage of 16.3. Term delivered child was 1 screening positive of the percentage of 20 in total positive, screening negative was 415 in the percentage of 83.2. The post-term delivered child was 0 screening positive of percentage 0, screening negative was 1 with a percentage of 0.2. The p-value is 0.001, which is statistically significant. So, gestational age is affecting the screening positive in my study population.[18] Other studies also show preterm and low birth weight delivered children are more affected by ASD than Term delivered children. Other parameters in my study population are parents' education status and place of delivery.[19] The Parent education status of my study population one of the parents who completed the 12th standard was more affected than the other. In place of delivery government hospital delivery children are most affected than private hospital delivery children. But their p values are> 0.05 statistically significant.[20]

Conclusion

The prevalence of ASD in my study is 1/100. Compare to other studies prevalence in the general population increases. The mean age of identification ASD symptoms in the population is 22.80 months ranging from 20 – 24 months in my study population. So early Screening at age of 16 to 24 months helps with early identification and early intervention. Male gender is more affected than female Male: Female is 4:1.LSCS, Preterm and low birth weight delivery children more affected than term and labor natural delivered children. So need care before delivery prenatal and perinatal care. Exclusively breastfed children are less affected than suboptimal breastfed children. Improve the awareness of exclusive

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breastfeeding. Partially immunized children significantly affected my study population. To improve the immunization status of children.

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