

Presentation of Restrictive and Repetitive Behaviors in Autism Spectrum Disorder

MUHAMMAD BASIT¹, ALLAH NAWAZ SULTAN², SHABIR AHMED³, NOSHEEN IFTIKHAR⁴, WAHEED AHMAD⁵, MUHAMMAD HAFEEZ⁶

¹Consultant, Deptt of Paediatrics, THQ Hospital Kulachi Dera Ismail Khan

²Assistant Professor, Deptt of Paediatrics Sharif Medical City Hospital Lahore

³Associate Professor, Deptt of Paediatrics Azra Naheed Medical College Lahore

⁴Associate Professor, Deptt of Paediatrics Sharif Medical City Hospital Lahore

⁵Assistant Professor, Deptt of Paediatrics Azra Naheed Medical College Lahore

⁶Senior Registrar, Deptt Paeds Medicine Holy Family Hospital Rawalpindi

Correspondence to Email: ashabir76@yahoo.com Cell 03004353171

ABSTRACT

Background: Autism spectrum disorders (ASDs) are lifelong developmental disabilities characterized by marked difficulties in social reciprocal interaction and communication, along with restricted and repetitive interests, attitudes and behaviors.

Aim: To determine the frequency and spectrum of restrictive and repetitive interests, attitudes and behaviors in patients with ASD.

Methods: A Descriptive cross sectional study was carried out at The Children's Hospital & Institute of Child Health, Lahore for six months. A total of 190 cases were enrolled in this study, Patients assessed for presence of restrictive and repetitive interests, attitudes and behaviors and its types including; Stereotyped or repetitive motor movements, insistence on sameness, highly restricted, fixated interests and Hyper or Hypo reactivity to sensory input. All the data was entered and analyzed on SPSS.

Results: The mean age of patients was 6.54±2.29 years. Male to female ratio was 1.63:1. The mean CARS score was 42.12±7.31. The restricted and repetitive interests, attitudes and behaviors were noted in 180(94.7%) patients.

Conclusion: Repetitive behavior was noted in 94.7% patients, stereotypies, insistence on sameness, highly restricted interests and hyper of hypo reactivity to sensory input was found in 42.6%, 30.5%, 10.5% and 11.05% respectively

Keywords: Repetitive, Behavior, Restricted Interests, Sensory Input

INTRODUCTION

Autism spectrum disorder is characterized by persistent deficits in reciprocal social communication and interaction across multiple contexts, including deficits in social reciprocity, nonverbal communicative behaviors issued for social interaction, and skills in developing, maintaining, and understanding relationship¹.

In 2014, the centers for disease control and prevention (CDC) released new data on the prevalence of autism in the united states. The overall prevalence of ASD was 14.7 per 1000 (one in 68) children aged 8 years. ASD prevalence estimates varied by sex and racial/ethnic group also. ASD is almost 5 times more common among boys (1 in 42) than among girls (1 in 189). Non-hispanic white children were approximately 30% more likely to be identified with ASD than non-hispanic black children and were almost 50% more likely to be identified with ASD than Hispanic children.² Studies in Asia, Europe and North America have identified individuals with ASD with an average prevalence of about 1%. A study in South Korea reported a prevalence of 2.6%.³ Nazish et al diagnosed autism in 3.2% of all the children referred to a tertiary care hospital in Pakistan with developmental delay⁴.

Most scientists agree that genes are one of the risk factors that can make a person more likely to develop ASD⁵. Children who have a sibling with ASD are at a higher risk of having ASD⁶ Restricted and repetitive behaviors (RRBs) associated with autism spectrum disorders (ASD) comprise a heterogeneous group of behaviors, but research during the last decade suggests that they can be divided into at least two dimensions or subcategories. Repetitive Sensory Motor behaviors include motor mannerisms, sensory seeking behavior, and repetitive use of objects whereas insistence on Sameness behaviors are characterized by compulsions and rituals and difficulties with changes in routine⁷. Behavioral subcategories such as these are of particular interest to researchers investigating biological processes that may underlie ASD, because they provide a means by which to organize the larger ASD population into smaller group of individuals with more similar behavioral profiles. Ultimately, it is hoped that identifying more phenotypically homogenous subgroups will facilitate effort to understand etiologies of ASD.

As restrictive and repetitive behaviors are an important part of diagnostic criteria (DSM-V) in ASD and are seen in 98% of children with ASD⁸ Therefore this study is planned to determine spectrum of different restrictive and repetitive behaviors, that will lead to administration of proper intervention program for management of ASD. This study was carried out to determine the frequency and spectrum of restrictive and repetitive behaviors in patients with ASD.

Operational Definitions

Autism Spectrum Disorder: ASD was defined as per CARS as detailed in Annexure (cut off value 29). Range 15-60

Restrictive and Repetitive Behaviors: Spectrum of restrictive and repetitive behaviors include any one of these from 1 to 4

Stereotyped or repetitive motor movements: Hand-flapping, rocking, jumping and twirling, arranging and rearranging objects, and repeating sounds, words, or phrases, spending hours lining up toys in a specific way instead of using them for playing, having household in a fixed order or place.

Insistence on sameness: Extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat specific food every day

Highly restricted interests: Strong attachment to or preoccupation with unusual objects e.g. stick, stones strings etc

Hyper or hypo reactivity to sensory input: Apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement.

MATERIAL AND METHODS

After IRB permission a descriptive cross sectional study was conducted at development outpatient Department of Children's Hospital and Institute of Child Health, Lahore during a period of six months. A total of 190 cases is calculated with 95% confidence level, 2% margin of error and taking expected percentage of restrictive and repetitive behaviors i.e., 98% in patients with ASD⁸. Non probability consecutive sampling was employed

Inclusion Criteria

1. Age range 3-10 years.
2. Both males and females included.
3. Patients diagnosed as ASD on CARS.
4. The subject's parents should read and sign the informed consent form.

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Exclusion Criteria

1. Children having autistic like features with primary diagnosis of ADHD, GDD (Global Development Delay) or intellectual disability (intellectual developmental delay) or overlapping features. (On clinical examination)
2. Other underlying medical or neurodevelopmental disorder like fragile X syndrome, Tuberous Sclerosis etc. (On medical ground)

Data Collection Procedure: After getting IRB approval, the purpose and procedure of the study was explained to parents/guardian and written informed consent was taken. Patients meeting diagnostic criteria were enrolled. Patients assessed for presence of restrictive and repetitive behaviors and its types including; Stereotyped or repetitive motor movements, insistence on sameness, highly restrictes, fixated interests and Hyper or Hypo reactivity to sensory input (as per operational definition). Data was collected on OPD basis through proforma and then verified by a consultant having at least 5 years' experience in Developmental Pediatrics.

Data Analysis Procedure: Data was stratified for age, gender and CARs score to address the effect modifier. Post stratification chi-square test was applied with p-value ≤ 0.05 as significant. Computer program SPSS version 10 was used for data analysis, results would be shown in table and graphs. Quantitative variables like age and CARs score was presented in the form of mean \pm S.D. Qualitative data like gender and restrictive and repetitive behaviors and spectrum of different restrictive and repetitive behavior (stereotyped more movements, insistence on sameness highly restricted interests, and hyper or hypo reactivity to sensory input) was presented in the form of frequency and percentages.

RESULTS

In this present study total 190 cases participated. The mean age of the patients was 6.54 ± 2.29 years with minimum and maximum ages of 3 & 10 years respectively (Table 1). In this study 118(62.11%) patients were male and 72(37.89%) patients were females. The male to female ratio of the patients was 1.63:1 (Fig. 1). The study results showed that the mean value of CARs score of the patients was 42.12 ± 7.31 with minimum and maximum score values of 30 & 55 respectively (Table 2). In this study the restricted and repetitive behavior was noted in 180(94.7%) patients while 10 (5.3%) patients did not have it (Table 3).

Out of 190 patients the stereotyped was noted in 81(42.6%) patients and while 99(52.1%) patients did not have it (Table 4). Out of 190 patients the insistence on sameness was noted in 58(30.5%) patients and it was not found in 122(64.2%) patients (Table 5). In our study the highly restricted interests were found in 20 (10.5%) patients and it was not found in 160(84.2%) patients (Table 6). In this study the hyper or hypo reactivity to sensory input was noted in 21(11.05%) patients and it was not found in 159(83.68%) patients. (Fig. 2).The study results showed that the restricted and repetitive behavior was noted in 180 cases [≤ 5 years=66, >5 years =114], [Male=112, Female =68], [≤ 5 CARs score=114, >45 CARs score =66], stereotyped were noted in 81 cases [≤ 5 years=33, >5 years =48] [Male=49, Female =32], [≤ 45 CARs score=45, >45 CARs score =36], insistence on sameness was found in 58 cases [≤ 5 years=18, >5 years =40], [Male=32, Female =26], [≤ 45 CARs score=42, >45 CARs score =16], highly restricted interest was found in 20 [≤ 5 years=8, >5 years =12], [Male=15, Female =5], [≤ 45 CARs score=12, >45 CARs score =08], similarly hyper and hypo reactivity was noted in 21 cases [≤ 5 years=7, >5 years =14], [Male=16, Female =5], [≤ 45 CARs score=15, >45 CARs score =06] (Table 7,8,9).

Table 1: Descriptive statistics of age (years)

n	190
Mean	6.54
SD	2.29
Minimum	3
Maximum	10

Fig.1: Frequency distribution of gender

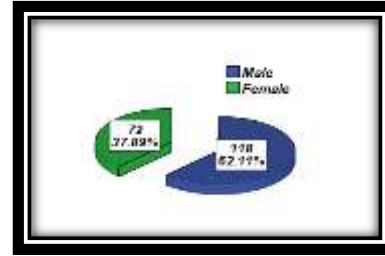


Table 2: Descriptive statistics of CARs score

n	190
Mean	42.12
SD	7.31
Minimum	30
Maximum	55

Table 3: Frequency distribution of restricted and repetitive behaviors

Restricted and repetitive behaviors	Frequency	Percent
Yes	81	42.6
No	99	52.1

Table 4: Frequency distribution of stereotyped

Stereotyped	Frequency	Percent
Yes	81	42.6
No	99	52.1
NA	10	5.3

Table 5: Frequency distribution of insistence on sameness

Insistence on sameness	Frequency	Percent
Yes	58	30.5
No	122	64.2
NA	10	5.3

Table 6: Frequency distribution of highly restricted interests

Highly restricted interests	Frequency	Percent
Yes	20	10.5
No	160	84.2
NA	10	5.3

Fig. 2: Frequency distribution of hyper or hypo reactivity to sensory input

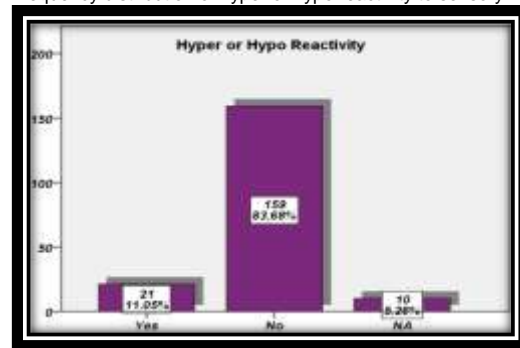


Table 7: Comparison of age with restricted and repetitive behavior, stereotyped, insistence, highly restricted and hyper and hypo reactivity

		Age (years)		Total	p-value
		≤ 5	> 5		
Restricted and repetitive Behaviors	Yes	66	114	180	0.396
	No	5	5	10	
Stereotyped	Yes	33	48	81	0.314
	No	33	66	99	
	NA	5	5	10	
Insistence on Sameness	Yes	18	40	58	0.391
	No	48	74	122	
	NA	5	5	10	
Highly restricted Interests	Yes	8	12	20	0.662
	No	58	102	160	
	NA	5	5	10	
Hyper of hypo reactivity	Yes	7	14	21	0.660
	No	59	100	159	
	NA	5	5	10	

Table 8: Comparison of age with restricted and repetitive behavior, stereotyped, insistence, highly restricted and hyper and hypo reactivity

		Sex		Total	p-value
		Male	Female		
Restricted and repetitive behaviors	Yes	112	68	180	1.000
	No	6	4	10	
stereotyped	Yes	49	32	81	0.779
	No	63	36	99	
	NA	6	4	10	
Insistence on sameness	Yes	32	26	58	0.295
	No	80	42	122	
	NA	6	4	10	
Highly restricted interests	Yes	15	5	20	0.291
	No	97	63	160	
	NA	6	4	10	
Hyper of Hypo reactivity	Yes	16	5	21	0.237
	No	96	63	159	
	NA	6	4	10	

Table 9: Comparison of age with restricted and repetitive behavior, stereotyped, insistence, highly restricted and hyper and hypo reactivity

		CARS score		Total	p-value
		≤ 45	> 45		
Restricted and repetitive behaviors	Yes	114	66	180	1.000
	No	6	4	10	
stereotyped	Yes	45	36	81	0.132
	No	69	30	99	
	NA	6	4	10	
Insistence on sameness	Yes	42	16	58	0.116
	No	72	50	122	
	NA	6	4	10	
Highly restricted interests	Yes	12	8	20	0.927
	No	102	58	160	
	NA	6	4	10	
Hyper of hypo reactivity	Yes	15	6	21	0.699
	No	99	60	159	
	NA	6	4	10	

DISCUSSION

This present descriptive cross sectional study was carried out at conducted at development outpatient Department of Children's Hospital and Institute of Child Health, Lahore to determine frequency of restrictive and repetitive behaviors in patients with ASD and to find spectrum of different restrictive and repetitive behaviors in patients with ASD.

ASD is an important mental impairment for the Social Security Administration as well as for stakeholders in the health care system and disability community, due in part to the considerable and continuous growth in the rates of disability attributed to ASD. RRBs are hallmark symptoms of ASDs; however, it has proven difficult to understand the mechanisms underlying these behaviors⁹.

In this study the restricted and repetitive behavior was noted in 180(94.7%) patients, stereotyped was noted in 81(42.6%) patients, the insistence on sameness was noted in 58(30.5%) patients, highly restricted interests were found in 20(10.5%) patients and the hyper of hypo reactivity to sensory input was noted in 21(11.05%) patients. Some of the studies are discussed below showing their results as.

One study by Duchan E et al¹⁰ showed that the over the last 40 years report that the conservative estimate of autistic spectrum disorder prevalence is 27.5 per 10,000 individuals; however, the prevalence estimate based on newer surveys is 60 per 10,000 individuals. Several factors are considered in various epidemiologic surveys of autism, especially the evolution of the concept of autism and changing criteria for diagnosis. As restrictive and repetitive behaviors are important part of diagnostic criteria (DSM-V) in ASD and are seen in 98% of children with ASD¹¹.

Bronia Arnott et al¹² found that 66% of children had an intense interest, with 29% of the whole sample being categorized as having an EII. There was a clear gender difference: 75% of

those children who had an EII were boys, and the EIIs of boys tended to be rated as more intense. Clare Harrop¹³ presented that the children with ASD displayed higher frequency and greater diversity of RRBs at all time points, however RRBs were not unique to ASD and evident in the TD control group albeit at a reduced frequency.

Richler et al. (2010)¹⁴ followed children's RRBs across four age periods, age 2, 3, 5, and 9. They also included separate analysis of repetitive sensory and motor behaviors and insistence on sameness behaviors. Results showed that repetitive sensory and motor behaviors remained high across these age points though they decreased in children with higher nonverbal IQs by age 9.

The nature of the restricted, repetitive behavior varies depending on developmental level as well as degree of disability, from stereotyped motor movements, such as hand-flapping, to behavior such as lining up or ordering objects, to preoccupation with a certain area of interest.¹¹

CONCLUSION

In our study the repetitive behavior was noted in 94.7% patients, stereotyped, insistence on sameness, highly restricted interests and hyper of hypo reactivity to sensory input was found in 42.6%, 30.5%, 10.5% and 11.05% respectively.

Conflict of interest: Nil

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