Characteristic Symptoms and Adaptive Behaviors of Children with Autism

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ABSTRACT

Objective: To determine the characteristic symptoms and adaptive behaviors of children with autism, as well as the distribution of autism severity groups across gender.

Study Design: Cross-sectional observational study.

Place and Duration of Study: Special Education Schools of Rawalpindi and Islamabad, from September 2011 to January 2012.

Methodology: Thirty nine children of either gender, aged 3 - 16 years and enrolled in special education schools, fulfilled the DSM-IV-TR criteria of autism. Among those, were identified as meeting the criteria of autism. The childhood autism rating scale-2 (CARS-2) was used to study the characteristics and severity of symptoms of autism. Later, adaptive behavior scale (school edition: 2) ABS-S: 2, was administered on children (n=21) to formulate the level of adaptive functioning.

Results: There were 15 boys and 8 girls with mean age of 10.6 ± 2.97 years. They showed marked impairment in verbal communication (mean=3.17 ± 0.90) followed by relating to people (mean=2.75 ± 0.83) and general impression (mean=2.73 ± 0.7). Most of the children showed average to below average adaptive behaviors on number and time (n=19, 90.5%), independent functioning (n=17, 81.0%), self direction (n=17, 81.0%), physical development (n=13, 61.9%), responsibility (n=12, 57.1%) and socialization (n=13, 61.9%) as well as poor to very poor adaptive behaviors on pre-vocational skill (n=15, 71.4%), language development (n=13, 61.9%) and economic development (n=13, 61.9%). The frequency of boys with autism was more towards moderate to severely impaired spectrum, without gender differences in any symptom associated with autism.

Conclusion: Comprehension of the presentation of characteristic symptoms of children with autism will be helpful in devising the indigenous intervention plans that are congruent with the level of adaptive functioning.

Key Words: Autism.   Adaptive behaviors.   Characteristic symptoms.   Autism spectrum disorder.   Special education.

INTRODUCTION

The reported prevalence rates of autism vary widely.[1] The prevalence has been reported to be 1% in developed countries.[2] Autism is a neurodevelopment disorder marked by triadic impairment in areas of social interaction, communication and repetitive or stereo-typed behaviors.[3,4] Children with autism usually show detached, passive sometimes active or odd social behaviors. Usually they are unable to cope with give and take of everyday human interaction. Even in the first few months of life, many of them do not interact and even avoid eye contact. They seem indifferent and distant to other people, and often prefer to be alone. The most significant feature of language impairment in autism is the lack of communication in a social context.[5] It is estimated that approximately half of all children with autism fail to develop functional speech. Mostly these children also demonstrate little to no receptive language skills and show mark impairment in expressive communication but there is mounting evidence that at least some children with autism display a profile characterized by a relative advantage of expressive over receptive language.[6]

It has been noted that these autistic children make no attempt to develop alternative communication methods, such as eye contact or body gesture, eventually as they grow up.[7] Moreover, unusual and repetitive motor mannerisms such as hand-flapping, spinning, rocking, bouncing of head etc. are also marked characteristics in autistic disorder. These repetitive behaviors usually depend upon their intellectual functioning.[8] In addition; they usually have difficulty in adjusting to change in their schedule or routine and may also engage in severe behavioral outbursts when such changes are implemented or maintained.[9] Children with autism show lower functioning in socialization and communication domains of adaptive behaviors. Adaptive skills are the crucial aspects of development that contribute strongly to prognosis, successful functioning and independency of an autistic child in the world.[10,11]

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There is the scarcity of research on the phenomena of autism in Pakistan. People are not fully aware of its characteristic symptoms and medical presentation. Moreover, little is known about its diagnosis and intervention.[12]

This research aims at studying the characteristic symptoms and adaptive behaviors of children with autism. It also aims to examine the distribution of autism severity groups across gender.

METHODOLOGY

The CARS-2[13] and ABS-S: 2[14] were used to study the characteristic symptoms and level of adaptive functioning in children with autism. The CARS-2 consists of 14 domains assessing behaviors associated with autism, with a 15th domain rating general impressions of autism. Each domain was scored on a scale ranging from one to four; higher scores are associated with a higher level of impairment. Total scores can range from a low of 15 to a high of 60; scores below 30 indicate that the individual is in the non-autistic range, scores between 30 and 36.5 indicate mild to moderate autism, and scores from 37 to 60 indicate severe autism.

Child adaptive behavior was measured by Adaptive Behavior Scales-School, 2nd edition (ABS-S:2) which assesses the adaptive functioning of school-aged children (ages 3 to 16 years). Individuals are asked to either select the highest item/statement that describes the child's behavior or indicate whether the statement is true or false by circling "Yes" or "No". The rating are then summed up to get a score on different domains of the scale.

The research was conducted in special education schools of Rawalpindi and Islamabad. Before conduction of the study inform consent was acquired from school authorities and from parents of children included in the study. Non-probability purposive sampling was employed and a set criterion was followed to screen the sample. Boys and girls with autism, aged 3 - 16 years, were part of the study, who were enrolled in special education schools of Rawalpindi and Islamabad. Initially, 39 children were screened on the basis of DSM-IV-TR criterion for autism disorder. Later, screened children were observed by two independent raters on the CARS-2. After these observations, only 23 children were diagnosed as potential cases of autism on the CARS-2. After acquiring the characteristic symptoms on CARS-2, adaptive functioning as reported by teachers / parents was assessed using ABS-S: 2. Parents of n=21 children responded on ABS-S: 2, regarding their child's adaptive functioning. Data of each client was completed in three to four sessions in natural school setting.

For data encoding and analysis, Statistical Package for Social Sciences (SPSS) version 18 was used. To establish inter-rater agreement for CARS-2 Cohen's kappa coefficient "κ" and for internal consistency of CARS-2 and ABS-S:2 Crohnbach's alpha "α" was established at significant level p < 0.05. One sample t-test (at significant level p < 0.05) was used to study the characteristic symptoms of autism. Microsoft office excel 2007 was used for the presentation of adaptive behaviors in frequencies and percentages for depiction of graphs. Using SPSS version 18, cross tabulation was done to summarizes categorical data (male and female) and severity level of autism (mild, moderate and severe), in a contingency table. To determine the gender differences across severity level of autism (mild, moderate and severe), Fisher's extract test (at significant level p < 0.05) was used because the expected value in the contingency table 3 were all below 10. As an additional analysis to see the gender differences across characteristic symptoms on 15 domains of CARS-2, a non-parametric Mann-Whitney U-test equivalent to t-test was also used because the data on fifteen domains of CARS-2 was on ordinal scale and two independent group are used (male and female). P-value ≤ 0.05 was taken as significant.

RESULTS

There were 23 children including 15 boys and 8 girls with mean age of 10.6 ± 2.97 years. Kappa was computed for assessing the interrater reliability of the observation on CARS-2. The kappa value derived between the rating of two raters was (κ = 0.86) significant at p < 0.001, which was considered as an excellent agreement between two raters. And Crohnbach's alpha for CARS-2 in the present study was α = 0.92, indicating excellent internal consistency. Crohnbach's alpha for ABS-S:2 in the present study was α = 0.68 depicting acceptable level of internal consistency for the scale.

Results mentioned in below Table I shows the characteristic symptoms of children with autism. As children were observed by two independent raters on fifteen

Table I: Characteristic symptoms of children with autism on 15 domains of CARS-2 (n=23).

Characteristics	Mean	SD	t-test
Verbal communication	3.17	0.90	16.74*
Relating to people	2.75	0.83	15.77*
General impression	2.75	0.77	16.91*
Visual response	2.73	1.0	12.56*
Fear of nervousness	2.69	1.0	12.34*
Imitation	2.61	0.84	14.85*
Emotional response	2.56	0.85	14.35*
Body use	2.51	1.0	12.02*
Activity level	2.51	0.66	18.14*
Non-verbal communication	2.41	0.95	12.11*
Level and consistency of intellectual response	2.32	0.68	16.40*
Listening response	2.26	0.92	11.76*
Taste, smell and touch response and use	2.23	0.89	12.02*
Object use	2.13	0.89	11.46*
Adaptation to change	2.11	0.86	11.78*
Total score	37.52	9.45	19.04*

*p <.001

different dimensions of CARS-2. Firstly, an average score of all fifteen domains and total score on CARS-2 was calculated and than one sample t-test was computed on average scores to compare characteristic symptoms on different domains of CARS-2.

To assess gender differences on fifteen domains of CARS-2, Mann-Whitney U-test was also conducted. There was no statistical difference found between boys and girls with autism on characteristic symptoms that are relating to people (U=42.00, p=0.23), Imitation (U=34.00, p=0.83), emotional response (U=40.50, p=0.199), body use (U=51.50, p=0.57), object use (U=47.50, p=0.40), adaptation to change (U=34.50, p=0.09), Visual response (U=51.00, p=0.728), listening response (U=44.50, p=0.30), taste smell and touch response and use (U=51.00, p=0.55), fear of nervousness (U=42.50, p=0.24), verbal communication (U=38.00, p=0.143), non-verbal communication (U=51.50, p=0.56), activity level (U=58.50, p=0.92), level and consistency of intellectual response (U=52.00, p=0.59) and general impression (U=40.50, p=0.198). The results showed that there was no significant difference between boys and girls with autism on characteristic symptoms as depicted by 15 domains of the CARS-2.

The assessment of the level of adaptive functioning presented in Figure 1 showed that most of the cases showed average to below average adaptive functioning in number and time (n=19, 90.5%), independent functioning (n=17, 81.0%), self direction (n=17, 81.0%) physical development (n=13, 61.9%), responsibility (n=12, 57.1%) and socialization (n=13, 61.9%) and poor to very poor adaptive behaviors on prevocational skill (n=15, 71.4%), language development (n=13, 61.9%) and economic development (n=13, 61.9%).
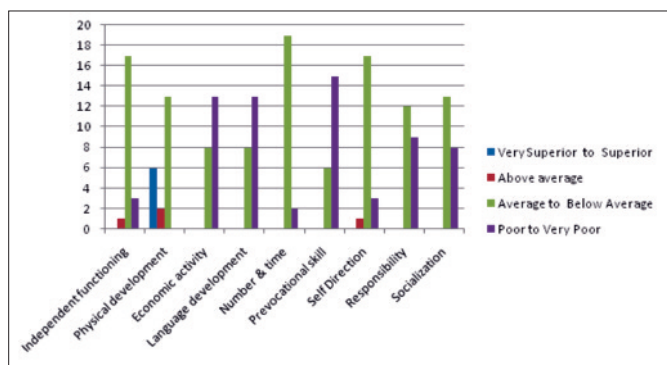

Figure 1: Comparison of various domains of adaptive behaviors on ABS:2-S.

Table II: Contingency table showing frequency of gender across severity groups on CARS-2 (n=23).

Gender	Severity group			Total
	Minimal to no symptoms of autism	Mild to moderate symptoms of autism	Severe symptoms of autism	
Male	4	5	6	15
Female	1	2	5	8
Total	5	7	11	23

The contingency table (Table II) showed that the diagnoses on CARS-2 has depicted that the frequency of male children is more towards moderate to severe end of the spectrum.

To see the gender differences across severity level of autism, (mild, moderate and severe). Fisher's extract test was also applied and results revealed that severity level of autism, (mild, moderate and severe) is not significantly differed by gender. As the (two-sided) extracted p-value was 0.859, there was no significant difference between severity level of autism and gender of the child.

DISCUSSION

The aim of this research is to identify characteristic symptoms and level of adaptive functioning of children with autism. Moreover, it also examined distribution of severity group across gender. It was seen that most of children showed impairment in characteristic symptom of verbal communication. As communication impairment is one of the defining features of autism and it has been established that most of the autistic children do not have speech at all and even if few have speech, it is a mixture of meaningless weird, infantile squeals and non-human sounds.[9] Finding on ABS-S:2 also showed similar trend where most of the sample ranged from poor to very poor in language development. On non-verbal communication and listening response scales of the CARS-2, situation was slightly better than verbal communication, as most of the sample lied from mild to moderate level of impairment but issue of receptive speech was still present.

Lack of meaningful speech is a source of stress for parents as well as special education staff. Behavior analytic methods have been proven more effective for addressing the behavioral issues in children and many of these methods were also effective for developing communication skills in children with autism e.g. prompting has been one of them and used to facilitate the occurrence of desired response.[17] Augmentative and alternative communication (AAC) has been very effective with children who suffered from severe expressive communication impairment. Unaided ACC system included system without any external devices e.g. gestures, manual signs and aided AAC systems (communication systems with external devices, e.g. communication boards, photographs, line drawings, words, letters, and computer-based technology with voice output). These systems could be easily taught and applied by speech therapists in special education schools of Pakistan. This area needs lot of research; it is important to develop indigenous strategies to work with children to develop their communication skills both at verbal and non-verbal level.[18,19]

Absence of verbal and non-verbal communication also hamper the children's social interaction. Social develop-

ment is also considered to be a core deficits in autistic disorder.[15] Accordingly, the sample of the study showed moderate to severe level of impairment in symptom of relating to people. Similar finding are observed on socialization scale of ABS-S:2 where most of the sample lies from below average to very poor category. Most of the time, the autistic children prefer to remain alone and detached. In this regard, the forceful attempts of the parents or caregivers are necessary to attain child's attention. In our culture, such children are called "*syain*", children who are absorbed in their own world and least bothered about what is being going around them.

Different interventions like social interest, social initiation, social responsiveness and empathy may help to improve autistic children. Joint family system is an advantage for helping autistic children in socialization. Living in collective culture of Pakistan, positive aspects may help in improving social development of children with autism. There is a need to teach the parents not to restrain and confine themselves and their children from social gathering just because of stigmatization related to this disorder. Interaction of the children to different social gathering can facilitate social development of such children. Appropriate social interaction can also be introduced through integrated system of education.[20]

The picture of adaptive functioning as measured by ABS-2, is very consistent with the findings of CARS-2. Most areas of adaptive functioning ranged from average to below average level. In socialization, most of the sample fall in average to below average category whereas in language development most of the sample lied between poor to very poor. These finding are consistent with the outcomes of relating to the people and verbal communication domain of the CARS-2. Similarly, on economic activity and prevocational skills, most of the sample lied in poor to very poor category. Prevocational skill is another important aspect which is mostly ignored. Due to the lack of knowledge and over protection by the parents, children are not usually exposed to vocational and pre-vocational skill that hampers their independent functioning. Intervention plans should cater the awareness and importance of these skills to make the child self sufficient.

Mild to moderate level of impairment is seen in taste smell, touch response and in object use. These children might show lack of response or over reaction to certain sounds and usually cover their ears when they hear some everyday sounds. Children were in the habit of excessive smelling and putting in eatable objects in mouth. Children with autism might be over sensitive to sounds and small changes in the daily routine. This is because of brain's inability to correctly process stimuli from the sensory inputs including vision, hearing, touch, taste, smell, vestibular and kinesthetic. The frequency of abnormal sensory responses has not been included in the diagnostic criteria for autism that is why it has been disregarded in some researches. It has been observed that impairment in sensory modalities is stressful for parents and teachers and it also hampers intervention process.[16]

Sensory integration therapy and other physical approaches like deep pressure, sensory diet, touch therapy/massage therapy are quite effective. Sensory therapy is not considered as part of intervention but it helps in reinforcing the child and above all children usually enjoy these sensory based activities.[21] The good thing in our culture is that people usually try this indigenous method of massage at home with their children and they report that these methods are really effective. We should work on creating awareness among the teachers and the parents for the importance of sensory therapy so that the child's intervention process can be supported. To get better prognosis, it is important to incorporate assessment of adaptive functioning while screening the children and most importantly when working on the intervention.[22]

Present research has shown that prevalence of autism is more in boys than in girls, which is very much consistent with current literature. Their was no significant difference on various dimensions of characteristics symptomology in boys and girls with autism.

Their is a need to create awareness about autism in general population, parents, teachers and staff. Early diagnosis and intervention can be possible, research has shown that earlier identification and diagnosis of autism can improve opportunities for the children to benefit from intervention and lessen the burden on parents.[24] There is a need for more research specific to cultural presentation of the disorder so that holistic intervention plans can be formulated. In future, research autism with co-morbid disorders should also be studied. Cohort studies are required to better conceptualize the presentation of symptomology across different age groups.

Beside symptomology and adaptive functioning, cognitive functioning should be included to get better picture. Sample was taken only from special education setups that limits the scope of the study. Age band of the sample was restricted.

CONCLUSION

Comprehension of the presentation of characteristic symptoms of children with autism will be helpful in devising the indigenous interventions plans that are congruent with the level of adaptive functioning.

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