

Symptoms of Children with Autism Spectrum Disorder, a clinical sample

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Objective: The aim of this report was to study the gender role on autism symptoms distribution and severity in a clinical sample from Iran. Then, the results were compared with the published study from the same community population sample, Iran.

Method: The subjects of this retrospective study were a convenient clinical sample of the referrals of children with pervasive developmental disorders. The diagnosis was made according to DSM-IV diagnostic criteria.

Results: Most of the subjects were boys. Boys were referred for evaluation more frequently than girls. The sample included 61 children and adolescents aged 2.1 to 15 years; of whom, 49 had autism. The mean age of children with autism was 7.2(SD=3.2) years. The mean of age, the diagnosis and severity of the symptoms were not related to gender.

Conclusion: Usually, those with severe cases of autism refer to clinics for treatment. Therefore, the clinical sample of children with autism is just the tip of the iceberg and they may not be the actual representative of community sample of children with autism. Preventive programs should be more focused on the screening and referring of inflected girls for service utilization.

Keywords: *Epidemiology, Iran, pervasive developmental disorders (PDD), Sign and symptoms*

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Autism is one of the pervasive developmental disorders (PDD) according to the Diagnostic and Statistical Manual of Mental Disorders; its diagnosis is quite stable for older ages (1).

A population-based sample study from USA on autism reported the prevalence of 53 per 10 000 (95% confidence interval, 45-61 per 10 000) in children aged 3 to 17 years (2). The estimated rate of autism spectrum disorders in school aged children population in Iran is about 1.9% (3). Autism has a population prevalence of 1/1000 while other autism spectrum disorders are relatively frequent with prevalence rates in the order of 1 in 250 and the other estimation approximately 60 per 10,000 persons (4).

Autism is more common in boys (79%) than in girls (2). Epidemiological studies on autism spectrum disorders reported a male to female ratio of about 3:1 (5). An epidemiological study on school aged children in Iran reported that there was no gender difference for prevalence of autism (3). The ratio of boys to girls in a clinical sample of children with autistic disorder in India was more than 2:1(6). It is interesting to note that first-born children were referred earlier than the later born children due to the more time the parents spend with first-born children (6).

In clinical samples of children with autism, qualitative impairment in social interaction and communication is reported more frequently than restricted interests and activities (6). While, the frequency of autism core

dysfunctions assessed by expert ratings do not vary with gender, parents report symptoms in girls more than boys, particularly regarding social problems (7). There is a bias that parents expect more socially desired behavior from the girls than boys (7).

There are also contradictory findings about association between autism severity and gender. While some studies reported that there is no gender difference in the severity of autism (e.g. (8)), others reported that boys are impaired on early social development compared to girls (9).

It is important to investigate the differences between clinical samples and epidemiological samples in order to find out who is referred and who is not. To the best of the author's knowledge, no published study compared the symptoms distribution and severity of children with autism between clinical and epidemiological samples. This study surveys symptoms distribution and severity in children with autism from a clinical sample and compares it with the results of a population-based epidemiological published study (3).

Both of the clinical and the community samples are from the same region, increasing comparability between the two populations.

Materials and Methods

Sample

The subjects of this retrospective study are a convenient sample of children with pervasive

developmental disorder (PDD) who referred to the Child and Adolescent Psychiatry Clinic affiliated with Shiraz University of Medical Sciences, Fars, Iran .

Instruments

Interviews: The children and one of their parents were interviewed using DSM-IV diagnostic criteria (10). Their demographic characteristics such as age and gender were gathered .

Pervasive developmental disorder (PDD) checklist: Severities of symptoms were evaluated by use of the PDD checklist of Child Symptom Inventory-4 (3, 11, 12). The checklist includes 12 symptoms in the three categories. The categories are 1) “qualitative impairment in social interaction”; 2) four items on the dimension of “qualitative impairments in communication”; 3) four items on dimension of “restricted repetitive and stereotyped patterns of behavior, interests, and activities”. Each category contains 4 symptoms. Each symptom is scored on a Likert scale with four choices of “0 = never”; “1 = sometimes”; “2 = often”; and “3 = almost always”. The total score of each category can be 0 to 12. Total scores for the whole checklist ranged from a minimum of 0 to a maximum total of 36. This system of scoring is used for evaluation of the severity of symptoms.

There is another scoring procedure by counting the symptoms (categorical model) with a score of 0 for “never/sometimes”, and 1 for “often/ almost always.” The maximum score is four and minimum score is zero for each category. The total score for the whole checklist ranges from 0 to 12. This standard instrument has been used in similar studies for survey of the prevalence of pervasive developmental disorder in school aged children in Iran (3) and it has enough validity and reliability (12) .

Diagnostic criteria of autism and Asperger’s disorder: Children with autistic disorder have 2 or more symptoms on the category of “qualitative impairment in social interaction”, at least one symptom on the category of “qualitative impairments in communication”, and at least one symptom on category of “restricted repetitive and stereotyped patterns of behavior, interests, and activities”. Delays or abnormal functioning in at least one of the above mentioned areas started before the age of 3.

Children with Asperger’s disorder have at least 2 symptoms of the category of “qualitative impairment in social interaction”, lack of any symptoms on the category of “qualitative impairments in communication”, and at least one symptom from the category of “restricted repetitive and stereotyped patterns of behavior, interests, and activities” (10)

The study was conducted according to the Good Clinical Practice Guidelines in accordance with the Declaration of Helsinki.

Analysis

The data analysis was conducted by SPSS-17. Chi-squared analysis and Fisher’s exact test were used for

categorical data. Continuous data were analyzed using non-parametric tests. Mann-Whitney test was used to examine the association of gender and age in children with autism. T-test was used to compare the mean age of the first-borne children group and the group of later-borne children. Statistical significance was defined as P value less than 5%.

Results

Demographic characteristics

The study subjects included 61 children and adolescents aged 2.1 to 15 years; of whom, 49 had autism. Thirty nine (79.6%) of the children with autism were boys. The mean age of children with autism was 7.2(SD=3.2) years. The mean age of children in the whole sample was 7.05 (SD=3.1) years. 45 (73.8%) of them were boys. About 50.8% of the children were the first-borne child in the family.

Prevalence of different types of PDD

Forty nine (80.3%) of the sample were children with autism. The rate for Asperger’s disorder was 3.3%. The prevalence of childhood disintegrative disorder, Rett’s syndrome and PDD-NOS type were: 5(8.2%), 2(3.3%), and 3(4.9%) respectively .

Thirty nine (81.3%) of the children with autism were boys. The mean age of the girls and boys with autism was not different (P=0.4 .)

As demonstrated in table 1, the most frequently reported symptoms in children with autistic disorder were as follows: “encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus”; “in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others” and “lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level” (93.8%, 89.6%, and 89.6% respectively). All of the 12 symptoms in children with autism were common and were more than 81% except for one of them that was about 67%. Except for the symptom of “persistent preoccupation with parts of objects”, none of the other symptoms were associated with gender

Severity of the symptoms was not different between the genders in children with autism (Table 2). Age of the first-borne children was not different from the group of later-borne children (t=0.8, df=49, P=0.8). Severity of symptoms was not different between the only child group and other children group (Table 3)

Discussion

This study on children at the clinic of child and adolescent psychiatry showed that the rate of autism was gender related. This finding was in accordance with many studies reporting that the rate of autism is 3 to 4 times more common in boys than in girls (13). A similar study on 51 children with the mean age of 3.28 years from a clinical sample in India reported that the ratio of boy to girl is 2.2: 1 (6). However, the current

Table 1 The frequency of the symptoms in children with autism

	Boys N=39		Girls N=10		Total		percent of the symptoms in the epidemiological study+	Difference between boys and girls
	n	%	n	%	n	%		
impairment in social interaction								
1. nonverbal behaviors	32	66.7	7	14.6	39	81.3	33.3	X ² =.08, df=1, P=0.7
2. peer relationships	32	66.7	9	18.8	41	85.4	76.7	X ² =.08, df=1, P=0.7
3. spontaneous seeking to share enjoyment, interests, or achievements with other people	32	66.7	8	16.7	40	83.3	80.0	X ² =.2, df=1, P=0.6
4. social or emotional reciprocity	34	70.8	8	16.7	42	87.5	43.3	X ² =.08, df=1, P=0.7
impairments in communication								
1. the development of spoken language	33	68.8	8	16.7	41	85.4	13.3	X ² =.1, df=11, P=0.7
2. initiate or sustain a conversation	35	72.9	8	16.7	43	89.6	60.0	†X ² =.001, df=11, P=0.9
3. stereotyped and repetitive use of language or idiosyncratic language	31	64.6	8	16.7	39	81.3	40.0	X ² =.4, df=11, P=0.5
4. Make-believe play	35	72.9	8	16.7	43	89.6	70.0	X ² =.001, df=11, P=1
Restricted repetitive and stereotyped patterns of behavior, interests and activities								
1. stereotyped and restricted interest	37	77.1	8	16.7	45	93.8	60.0	X ² =.1, df=11, P=0.7
2. nonfunctional routines or rituals	36	75.0	6	12.5	42	87.5	63.0	†X ² =4.3, df=11, P=0.7
3. motor mannerisms	35	72.9	6	12.5	41	85.4	30.0	†X ² =3.1, df=11, P=0.3
4. preoccupation with parts of objects	30	62.5	3	6.3	33	68.8	53.3	X ² =6.4, df=11, P<0.01

+ [3] ; † Fisher's exact test

Table 2. The comparison of severity of total score and each dimension score between genders in children with autism

Dimension	Mann-Whitney U	P
Social interaction	171.3	0.9
Communication	132.5	0.2
Restricted repetitive and stereotyped patterns of behavior, interests and activities	1116.0	0.1
Total score	163.0	0.7

result is not in accordance with the results of the population-based epidemiological study that was conducted in the same region in Iran (3).

That study reported lack of association between autism frequency and gender. This may show that boys are referred for evaluation more frequently than girls. It is not clear if the parents consider autism symptoms less abnormal in girls than in boys or they refer their inflicted girls for evaluation less compared to boys.

Another possible explanation for the gender difference might be that girls are referred later than boys. However, the current results indicated that the mean age of children with autism was not related to gender. In addition, the mean age of children with autism in the epidemiological study was not different between boys and girls (3). Therefore, this is not in favor of the explanation that boys are referred earlier than the girls with autism.

Another reason for the difference between genders might be related to the severity of the disorder in boys and girls. The epidemiological study in school age children in the same region with the same measure reported that the severity of autism was not different between genders (3). Therefore, the difference for the gender ratio in the clinical sample cannot be justified

by the possible different severity of autism in genders. Of course, it should be emphasized that the previous study in Iran reported screening symptoms of autism that were completely different from autism disorder (3).

Then, it might be suggested that although the severity of autism is not different between genders, the severity of the different dimension of autism might be different between genders and it may lead to lower prevalence of referred girls. However, the current study found that the severity of none of the three dimensions of autism is different between groups. In addition, the epidemiological study reported lack of difference between genders (3). It means that girls are not referred later due to possible lower severity of their symptoms. Meanwhile, we do not know if females with ASD (who are often with much lower functioning) are referred to other clinics; for example, intellectually disabled children and children with autism spectrum disorder may or may not be part of the diagnostic process there. In that case, girls who are not referred to the clinic in the current study are not necessarily non-referred at all. The fact that age did not differ between genders may not be a good reason to conclude that girls are not

referred later.

Finally, it is possible that the difference between girls and boys may be related to their parental education and socioeconomic class. The status of occupation and educational level of the mothers and fathers were not different between boys and girls. Therefore, the lower rate of girls cannot be explained by socioeconomic class differences.

Therefore, there is an unjustified difference between genders regarding frequency of autism in the clinical sample. It is highly possible that girls with autism symptoms are probably more ignored for referring and treatment. These results indicate that preventive programs should be more focused on the detecting and referring for treatment for girls. Moreover, in our culture, there is a bias just in reverse of the possible bias towards children with autism in Western cultures. In the western cultures, parents have a bias that they expect more socially desired behavior from girls than boys (7). While, the current results show that in the Iranian culture, parents expect more socially desired behavior from boys than girls. Parents, especially parents of girls, must be informed and educated about this disorder for early referring and diagnosis.

The three most common symptoms in children with autism in the community sample were "lack of spontaneous seeking to share enjoyment, interests, or achievements with other people"; "failure to develop peer relationships appropriate to developmental level"; and "lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level". The three most common symptoms in the current clinical sample were "encompassing preoccupation with one or more stereotyped symptoms"; "lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level"; and "in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others". It is notable that prevalence of all of the symptoms in the clinical sample was more than the community sample. It indicates that the most severe cases of autism usually refer to clinics for treatment. It means that children with mild to moderate forms of autism are not usually referred to clinics and they are probably ignored.

It is interesting to note that being a first-borne or a later-born child was not related to age or severity of symptoms of autism. This finding is not consistent with a previous and a similar study which was conducted in India (6). However, this might not support the hypothesis that the parents spend more time with their first-born children than the later-born children.

Moreover, the composition of the clinical sample of the 61 PDD children is quite unusual because the rate of Childhood Disintegrative Disorders (CDD) outnumbers the rate of PDD-NOS. In addition, the rate of Retts disorder is equal to that of Aspergers disorder. Ordinarily, Aspergers disorder is far commoner than Retts disorder and CDD. These show that our sample is a deviated clinical sample of PDD. It probably means

that our clinical sample cannot be easily compared with the community sample. Future prospective studies with more rigorous sampling method and a much larger sample size should be conducted to compare symptoms between PDD males and females based on a much larger representative clinical sample of PDD.

Limitations

There are some limitations and serious shortcomings in this study that should be considered. First of all, the sample size was small. The subjects were not evaluated for their IQ. The mean age of children in the epidemiological study was 9.1 years while in the current study it was 7.05 years. The age range of children in the clinical sample was 7 to 12 years. The number of the participants in the community sample was 1600 which is more than the current clinical sample. The possible confounding effects of IQ and age cannot be ruled out. It is likely that children with more impaired intelligence are referred to clinics and this may be the possible explanation for the differences between the community and the clinical sample. Moreover, the sample was from just one clinic; consequently, generalization of the results to other clinics might not be guaranteed. Despite of all the limitations, this was the first study to compare children with autism who were diagnosed according to DSM-IV diagnostic criteria in a clinical and epidemiological sample.

Conclusions

In the Iranian culture, parents expect more socially desired behavior from boys than girls. Parents of girls must be informed and educated about autism disorder for early referring and diagnosis. Prevalence of all the symptoms of PDD in the clinical sample was more than the community sample. Severe cases of autism usually refer to clinics for treatment, but mild to moderate forms of autism are not usually referred to clinics and most probably are ignored.

Future studies

It is possible that girls with autism are under diagnosed, so further studies should be conducted with semi-structured interview to detect the disorders. Future studies should investigate why children who have milder symptoms are not referred and why they have not received adequate help.

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