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Original Article

Demographic correlates of children and adolescents with Autistic disorder

Ayyoub Malek[1], Shahrokh Amiri*[2], Afshin Razzaghi-Rezaih[3], Salman Abdi[4], Ali Baharigharehgoz[5]

[1] *Professor, Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran*
[2] *Associate Professor, Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran*
[3] *Resident, Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran*
[4] *Psychologist, Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran*
[5] *Psychologist of Exceptional Children, Education Office, Tabriz, Iran*

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Abstract

Introduction: Comparison of the demographic characteristics of patients provides useful information to their identification. This study aimed to determine the demographic characteristics of children and adolescents with autistic disorder (AD).

Methods: In this cross-sectional case-control study, 115 children and adolescents with AD were selected from Autism Society Rehabilitation Center in Tabriz, Iran, and 112 normal children and adolescents from the public schools, in 2014. The participants in both groups were matched regarding age and gender. Diagnosis of AD was performed using diagnostic and statistical manual of mental disorders-4th edition (DSM-IV) criteria and clinical diagnostic interviews by two child and adolescent psychiatrists. The demographic information of children and adolescents and their parents were collected from the medical records of children and interviews with their mothers.

Results: Most of the children with autism had second or higher birth order and had families with more than three members. Mothers of children with autism had significantly lower levels of education and were mostly housewives. Fathers of autistic children mostly had high school diploma and fewer had university education, and most of them were employed. However, there was no statistically significant difference between the AD group and the control group regarding the average height and weight of children and the residence (urban or rural) and age of parents at childbirth.

Conclusion: The demographic characteristics of the two groups of children and adolescents with AD and normal controls were different from each other regarding family size, birth order, parent occupation, and parent education variables.

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Introduction

According to the diagnostic and statistical manual of mental disorders-4th edition-Text revision (DSM-IV-TR), autistic disorder (AD) is identified with impairment in social interaction, qualitative impairments in communication, significant limitations of interests and activities and preoccupation with parts of objects.[1] The prevalence of autism spectrum disorders (ASD) is estimated 0.75-2.64% children in nonclinical sample of children.[2] Moreover, the prevalence of ASD at the age of eight is estimated between 5.7 and 21.9/1000 children.[3] The prevalence of AD in a sample of Iranian children at the age of five was estimated 6.26/10000.[4]

The severity of damages caused by AD[1] and individual, family and social consequences of AD[5] signifies the importance of identifying the risk factors for autism, which can be useful in prevention and

*** Corresponding Author:** Shahrokh Amiri, Email: amirish@tbzmed.ac.ir

management. Therefore, various studies[6,7] have implemented various strategies to identify the risk factors for AD. It seems that one of the most important factors in the management of AD is to understand its demographic characteristics, which can be easily used to control the AD.

The links between the advanced parental age and several psychiatric disorders such as AD, schizophrenia and early onset of type I bipolar disorder have been determined.[8] Such that the studies by Croen et al.[6] and Reichenberg et al.[7] indicated the effects of advanced maternal and paternal age at birth on the risk of AD.

Previous studies have reported low birth weight[9] and overweight in children with autism compared with normal children.[10] Such that the prevalence of obesity and overweight in AD has been reported 17 and 18%, respectively.[11] However, in these studies, the average weight of children with autism and normal children is not mentioned, and they solely investigated overweight and obesity criteria. Therefore, further studies are required to clarify the existing ambiguities.

Developmental abnormalities (especially head-to-height ratio) have been reported in children with autism, and in terms of birth order, autism is more common in first-born children.[12] The research carried out in Iran showed that the parental age and education level are risk factors for the development of autism in children so that the advanced paternal age and the parental higher education level increases the risk of development of autism in children, nevertheless, the advanced maternal age has no relationship with the development of autism in children.[13] They also reported that first-birth order and urban residence are contributing factors in the development of autism.[13] Another report indicated that there were no differences between two groups of parents of children with AD and two other groups of children with other disability and typically developing children regarding the average age of parents and their educational level.[14]

Since the findings of psychiatric studies are affected by geographical location and the interaction of environmental and nature factors, this study aimed to compare the demographic characteristics (order of birth, height and weight of children and age, education level, employment status and place of residence of parents) of children and adolescents with AD and normal controls.

Methods

This case-control study was conducted in 2014. The study population included 115 children and adolescents younger than 18 years old with AD who were selected from an autism society rehabilitation center in Tabriz, Iran, using convenience sampling. Autism was diagnosed based on DSM-IV criteria and clinical diagnostic interviews by two child and adolescent psychiatrists.

Moreover, 112 normal children and adolescents were selected from the children and adolescent students of public schools in Tabriz using cluster random sampling. Accordingly, first, three districts out of the five educational districts in Tabriz were randomly selected, and one girl's school and one boy's school were randomly selected from each district. Then one class from each school was randomly selected, and all students were included in the study based on inclusion and exclusion criteria. Those who, after filling out the strength and difficulties questionnaire (SDQ), had no psychiatric disorder were selected. The participants of the two groups (case and control) were matched regarding age and gender.

All the ethical standards related to the participants of the study were considered during implementation, such that awareness of the research objectives, confidentiality of information of the individuals and the participants' right to be excluded from the study were observed.

Parental consent to participate in the study, age of < 18 years old and diagnosis of AD were the inclusion criteria for children with AD. In addition, parental consent to participate in the study, a maximum of 18 years of age and not having psychiatric

disorders were the inclusion criteria for the children in the control group. The presence of any known medical, endocrine, metabolic or neurological disorder or disease associated with AD was the exclusion criterion.

In this research, the medical records of children and interviews with their mothers were used to obtain the demographic information of children and adolescents (gender, age, height and weight) and their parents (maternal age, paternal age, residence, family size, birth order, maternal education, paternal education, father occupation, and mother occupation).

Kiddie schedule for affective disorders and Schizophrenia (K-SADS)

K-SADS is a semi-structured diagnostic interview designed based on DSM-III-R and DSM-IV criteria, which is filled by a psychiatrist through interviews with parents and children. K-SADS is scored using a 0-3 point rating scale. Zero score indicates a lack of adequate information, score one indicates the presence of symptoms, score two represents the sub-threshold level of symptoms and score three represents the threshold criteria. In Iran, Ghanizadeh[15] reported the reliability of the Persian version of K-SADS 0.81 through the test-retest method and 0.69 through inter-rater method. In this study, K-SADS was used to assess lack of psychiatric disorders associated with autism.

SDQ

The SDQ; Goodman[16] is a brief behavioral screening questionnaire for investigating the mental health of children and adolescents which contains 25 questions that consist of five subscales including (emotional problems, conduct problems, hyperactivity/inattention problems, peer problems and pro-social behavior) each having 5 items. The SDQ scoring method is as follows: 1 = not true, 2 = sometimes true, 3 = always true. In Iran, the Persian version of the SDQ has been used among 3-17 years old individuals by Ghanizadeh et al.[17] and its psychometric properties have been confirmed. Moreover, the reliability of the questionnaire has been reported 0.73 using Cronbach's alpha. In this study, the SDQ was used for screening and diagnosing normality of the control group.

All the statistical analyzes were performed using SPSS software (version 21, SPSS Inc., Chicago, IL, USA). The descriptive statistic methods (frequency, percentage, mean and standard deviation), Fisher's exact test and odds ratio were used for comparing the frequency of the demographic characteristics of the two study groups. Moreover, the independent t-test was used to compare the mean age, height, and weight of children with autism and normal controls.

Results

A total of 115 children and adolescents with AD and 112 normal control children and adolescents were included in the study. Based on the results of the independent t-test (Table 1), there was no statistically significant difference between the two groups regarding their mean age, height, and weight.

Fisher's exact test was used to compare the frequency of gender distribution of children (Table 2), parental age at childbirth, family size, parents' occupation, and family residence between the group of children and adolescents with AD and the control group. The results showed that there were no statistically significant differences between the two groups of AD and control group regarding the frequency of gender distribution of children (male and female), parental age at childbirth (below and over 35) and residence (urban and rural).

Table 1. The results of t-test comparing the age, height and weight of children and adolescents with autistic disorder and controls

Variables	Autistic disorder	Control	t-test	
	Mean ± SD	Mean ± SD	t	P
Age	6.94 ± 3.55	7.63 ± 3.52	1.45	0.140
Height	119.41 ± 16.19	122.13 ± 19.83	1.13	0.250
Weight	26.53 ± 11.02	28.16 ± 14.31	0.96	0.330

SD: Standard deviation

Table 2. Frequency and percentage of demographic characteristics of autistic and normal children and adolescents and Fisher's exact test results

Variables	Autistic disorder	Control group	Fisher's exact test		OR (95%CI)
	n (%)	n (%)	χ^2	P	
Gender					
Boy	68 (61.8)	70 (64.2)	0.13	0.780	0.90 (0.52-1.56)
Girl	42 (38.2)	39 (35.8)			
Mother age in birth day of child (year)					
Low than 35	104 (90.4)	100 (89.3)	0.08	0.820	1.13 (0.47-2.68)
35 and more	11 (9.6)	12 (10.7)			
Father age in birth day of child (year)					
Low than 35	70 (60.9)	61 (54.5)	0.95	0.340	1.30 (0.76-2.20)
35 and more	45 (39.1)	51 (45.5)			
Family size					
Three	38 (33.0)	55 (49.1)	6.05	0.010	0.51 (0.29-0.87)
More than three	77 (67.0)	57 (50.9)			
Birth order					
First	50 (43.5)	68 (60.7)	6.75	0.010	0.49 (0.29-0.84)
Second and more	65 (56.5)	44 (39.3)			
Maternal education					
Under diploma	32 (27.8)	26 (23.2)	0.63	0.450	1.27 (0.70-2.32)
Diploma	63 (54.8	27 (24.1)	22.31	< 0.001	3.81 (2.16-6.72)
Academic	20 (17.4)	59 (52.7)	31.13	< 0.001	0.18 (0.10-0.34)
Paternal education					
Under diploma	21 (18.3)	28 (25.0)	1.52	0.250	0.67 (0.35-1.26)
Diploma	94 (81.7)	82 (73.2)	2.36	0.150	1.63 (0.87-3.07)
Academic	42 (36.5)	59 (52.7)	5.99	0.010	0.51 (0.30-0.87)
Father occupation					
Unemployed/retired/other	6 (5.2)	4 (3.6)	0.36	0.740	1.48 (0.40-5.41)
Administrative employment	30 (26.1)	51 (45.5)	9.35	0.002	0.42 (0.24-0.73)
Self-employment	79 (68.7)	57 (50.9)	7.48	0.007	2.11 (1.23-3.63)
Mother occupation					
Employed	19 (16.5)	51 (45.5)	22.39	< 0.001	0.23 (0.12-0.43)
Housewife	96 (83.5)	61 (54.5)			
Residence					
Urban	102 (88.7)	102 (91.1)	0.35	0.660	0.76 (0.32-1.83)
Rural	13 (11.3)	10 (8.9)			

OR: Odds ratio; CI: Confidence interval

According to table 2, based on the results of the Fisher's exact test, the frequency of birth order (first and second/higher than second) was different in AD and control group; autistic children mostly had second or higher birth orders [odds ratio (OR) = 0.49, confidence interval (CI) = 0.29-0.84, P < 0.050]. The frequency of family size (three and more than three) was different in the two groups of AD and control group; most of the autistic children were born to families with more than three members (P < 0.050).

The frequency of educational status (lower than high school diploma, high school diploma and university degree) of mothers of children with AD and control group was different; mothers of autistic children were less educated compared with mothers of normal control group (P < 0.001). The frequency of educational status (lower than high school diploma and high school diploma) of fathers of children with autism and control group was not statistically different. However, parents of children with autism had lower university education (P < 0.050).

The frequency of administrative employment status in parents of children with autism was lower compared with parents of the control group (P < 0.010). Moreover, the frequency of self-employment status in parents of children with autism was higher compared with parents of the control group (P < 0.010). The frequency of distribution of housewives and employed mothers of children with AD and control group was different; the majority of mothers of autistic children were housewives (P < 0.001).

According to table 2, binary logistic

regression was performed to assess the effect of mother and father age in birthday of the child, family size, child birth order, maternal and paternal education, father and mother occupation, and residence on children's risk of having autism. The results showed that, among the predictor variables, the two variables of maternal education level (under diploma and diploma) are associated with children's increased risk of having autism ($P < 0.050$).

Discussion

This study, which aimed to determine the demographic characteristics of children and adolescents with AD, showed that there is no significant difference between the children with AD and normal control children regarding the average height and weight. This finding is in contrast with reports that emphasize on the higher prevalence of obesity and overweight in children with AD.[11,18] It seems that lack of a control group, as well as the presence of samples of children with other ASD in those studies, are the probable causes of contradiction of their findings with our study.

Consistent with the other report, there was no difference between the autism group and the normal control group regarding the parental age at childbirth.[14] This finding is in contrast with the study that found an association between paternal age of 35-49 years and AD.[19] In another report, advanced paternal age was reported as a risk factor for ASD.[20] Since there were few samples in the parental age distribution range of over 40 in this study, it seems that we need larger sample of children with AD with parents of older than 40 at childbirth to understand the impact of parental age.

The results showed that the frequency of second and higher birth orders are more prevalent in autistic children whereas previous reports have reported first birth order[12,13] as risk factors for autism.[21] Based on these findings, birth order is probably not a direct and decisive determining factor for AD. However, the need to study the contradictions in the previous reports requires further investigation.

The findings of this study showed that there is no relationship between the urban/rural residence and autism. However, previous reports have emphasized on the relationship between autism and urbanization[13,22] and the reason was reported as higher neonatal environmental microbial exposures in urban areas.[23] Nevertheless, urban residence factor cannot be considered as the direct cause of this problem. Particularly, because many of the villages and cities in Iran are close to each other and have similar health and social status. Therefore, in the future studies, it is important to investigate the sanitary facilities as well as the diversity of neonatal environmental microbial exposures to clarify the contradiction of the results.

According to the research findings, mothers of autistic children had significantly lower educational levels, and fathers of autistic children had significantly lower levels of university education. However, it is reported that higher parental educational levels increase the risk of autism in children.[7,13] Furthermore, considering parents' educational levels as a significant variable in disease management is important. Basically, low parental educational levels can be an obstacle to managing autistic children.[24] Therefore, in therapeutic interventions, the need to recognize families with low educational levels and to train them is a necessity.

Another part of the findings of this study showed that self-employment was more frequent in fathers of children with autism compared to the control group. Moreover, the frequency of housewives was greater in mothers of children with autism compared to the control group. However, the report by Windham et al.[25] demonstrated that mother occupation in technical fields is associated with ASD in offspring such that mothers of ASD were somewhat more likely to work in hi-tech occupations (6.7%) than mothers of control group (4.0%). Nevertheless, in their study, there was no significant difference between fathers of children with autism and

normal control group regarding of fathers' employment status.

Limitations

In this research, the study was conducted on the sample of children with AD and other ASD (such as Asperger's syndrome) were not studied. In addition, the population of patients with AD mostly included urban residents. Furthermore, the severity of AD was not controlled in this study. Moreover, selecting the samples using convenience sampling can be among the limitations of this study. The above limitations and the questions raised in the discussion suggest the importance of complementary studies.

Conclusion

According to our findings, demographic characteristics of height, weight, place of residence and parental age were not associated with the development of AD in children. However, birth order, family size, employment status, and educational level of parents were different between the two groups of children and adolescents with AD and a normal status. These findings imply that demographic characteristics are very important in differentiating autistic children from normal children, and they can be used in managing AD in children and adolescents. This finding can be helpful in clinical diagnosis and identification of high-risk groups of children suspected of having autism.

Conflict of Interests

Authors have no conflict of interest.

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