

The Correlation between Autism Severity in Parents Having Autistic Children and Their Children's Morbid Symptoms

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Abstract

The current research was conducted by the aim of studying the correlation between autism severity in parents having autistic children and their children's morbid symptoms. This research is a correlative study. The population includes all of the parents having 4-11 year old children suffering from autism who visit ZehneZiba clinic and Tehran Autism Society in 2013. By the use of available sampling 200 parents were chosen as the sample. Child symptom inventory-4 (CSI-4) and Autism spectrum Quotient were the tools used in this research. Results of multivariate regression showed that parents having children suffering from autism achieve high scores in autistic traits and a significant correlation exists between the autism severity in parents and the autism disorder in child. Also a significant correlation was found between the autism severity of parents and autistic children's morbid symptoms in disorders such as attention deficit hyperactivity disorder (ADHD), behavioral disorder, tic, obsession, schizophrenia, incontinence of urine and feces, social phobia, and anxiety disorder. Yet no correlation existed between the autism severity of parents and disorders such as depression, separation anxiety, and coping behavior disorder. These findings provide some evidences about problems and weaknesses of parents having autistic children in autistic traits and the correlation of these defects with the mental health of children suffering from autism.

Keywords: Autism Severity, Parent's Autism, Children Suffering from Autism, Morbid Symptoms, Autism Spectrum.

Introduction

Autism is a kind of pervasive developmental disorder (PDD) which is diagnosed through severe damage in social interactions and the communicational skills and also existence of stereotype behaviors, interests and activities (American Psychological Association (APA), 2000). Children suffering from this disorder have disorderliness in processing sensory information thus they show abnormal responses toward the sensory stimuli (such as avoidance responses and too much reacting toward them) (Kientz & Dunn, 1997; Jasmin, Couture, McKinley and et al, 2009). Emotional disorders and problems (Rapin, 1991), motor skills, especially delicate movements of hands, activities of daily living (Restall & Magill-Evans, 1994; Watling, Deitz, White, 2001) and playing, language learning and natural speech (Corbette & Prelock, 2006) and problems about imitating others are seen in these children (Sevlever & Gillis, 2010). It could be said that these children have a broad spectrum of medical cognitive disorders (Klin, 2006). Annually the stats for autistic children is increasing, National Institute of Mental Health (NIMH) estimated that the prevalence of this

disorder in 2010 would be one case in each 99 individuals. Since autism is defined as a spectrum, the sensory and motor problems, the stereotype and obsessive behaviors, language problems, social problems and a broad spectrum of psychological and medical disorders are seen in these children. It seems that autism is a genetic disorder and interaction of several genes play roles in its formation (Klin, 2006). Existence of such problems in individual suffering from autism and its negative effect on one's social interaction with the surrounding environment make researchers pay too much attention to this disorder. The sums of these factors give importance to do efforts for diagnosing and performing therapeutic intervention.

Some of the studies have indicated the existence of some milder traits of Autism Spectrum Disorders in parents having such children. The term autism spectrum phenotype refers to behavioral characteristics observed in 15-20% of non-autistic relatives of these patients. Among these behavioral and cognitive characteristics we can mention communicational and linguistic features such as incorrect use of language, talkativeness and silence, being shy, social isolation, and excessive caution (Palermo, Pasqualetti, Barbati and et al, 2006). Although it is not possible to put clinical diagnoses on these relatives, autistic traits have been seen in them. On the other hand several genes have been diagnosed to be responsible for separate components of autism spectrum phenotype (Pellicano, 2008). Probably the autism spectrum phenotype is related to the social and cognitive weaknesses and also the observed psychological problems in parents. Further researches showed that autism spectrum phenotype is not limited to behavioral characteristics and it also includes the social and cognitive problems (Szatmari, Georgiades , Duku and et al 2008). These researches have targeted different cognitive aspects such as performance, visual attention, memory, linguistic, sensory and motor abilities, empathy, recognizing emotions, image processing and visual attention (Sucksmith, Roth ,Hoekstra , 2011). These common features are mainly about social and cognitive fields and it seems that a milder aspect of this disease is seen in parents (Constantino, 2002). For the 1st time in 1944 Kanner indicated these features and called these parents as silent, alone, uninterested in social interactions and being obsessive (Kanner 1944; Quoted by Bailey, Palferman, Heavey and et al, 1998).

Now at this point this question crosses mind that how does this type of personality trait of parents and the effects of family on their children suffering from autism appear? Is it possible that despite having a suffering child the bilateral effects of family members on each other creates other disorders in these children?

Due to the increase in the infection rates of autism it has been years that this disorder in children has been at the center of attention in terms of researches and treatments. Accepting these children in society and family is accompanied by several problems. Presence of an individual with the autism spectrum disorders causes some fundamental changes in the family system and it affects the family whether negatively or positively (Sivberg, 2002). Parents of these children are deprived of boosters that other parents receive (attachment, expressing verbal or practical love, playing and bilateral interaction), furthermore in the traditional Iranian society nursing the patient within the family is one of the duties and priorities of the parents, which is a factor for increasing the mental pressure (Samadi, McKenna, 2011). If we want to put more focus on these important things we could focus on the most important factor of parent-child relationship.

Autistic children have no social communicational and also no empathy and these defects lead to disconnection from environment and individuals. Now if their parents have the same features and defects (not as much as the disorder) obviously the communicational bridges between parent-child will be broken and no effective verbal and emotional communication will happen in the right path. Parents' weaknesses in skills and communications could be set as an example for the children and since autistic children need to communicate and learn verbal and emotional skills, they are deprived

of them, and the shortcomings and defects of their parents could play important role in creating problems simultaneously with autistic disorder such as forming morbid symptoms and behavioral disorders. Autism severity in parents as a hypothesis could be an indicator of severity of created disorders in children and by the change of this low or high severity it could be used as a factor for increasing or decreasing the morbid symptoms and the behavioral problems in children. The current research aims to study below hypotheses:

1. A correlation exists between the autism severity of parents and the autism disorder in children.
2. Existence of comorbidities with autism disorder.

Methodology

The current research is a correlative one, the population includes all of the parents having 4 to 11 year old children who suffer from autism visiting ZehneZiba clinic and Iran Autism Society in 2013. By the use of available sampling, 200 parents were chosen as samples.

Instruments

Child symptom inventory-4 (CSI-4): A screening tool for diagnosing the morbid symptoms of 21 behavioral and emotional disorders in 5 to 12 year old children and its phrases are provided based on the DSM diagnostic criteria, and it has parent form, coach form and teacher form. Questions are reported based on the 4-item Likert scale (never, sometimes, usually and most of the times). The 4th version of this questionnaire (CSI-4) was revised by Gadow and Sprafkin (1994) with some minor changes than the previous versions. In Grison and Carlson (1991) research its sensitivity for oppositional defiant disorder, conduct disorder and attention deficit hyperactivity disorder (ADHD) was respectively 0.66, 0.58, and 0.72 (Gadow and Sprafkin, 1994). In the research of Rahimzadeh, Pouretmad, SamieiKorani and et al (2008) the internal consistency coefficient of teacher form was 0.94, and its validity coefficients in different researches were reported in the range of 0.76 to 0.92 (Ghassabi, Tajrishi, Mirzamani, 2009).

Autism spectrum Quotient: This scale is prepared by Auyeung, Baron-Cohen, Wheelwright, Skinner and et al (2001) for studying the subliminal symptoms of autism disorders and it was translated by the Institute of Cognitive Science and includes 50 phrases with 4 items. All of the 10 questions measure one of the cognitive fields of social skills, shift of attention, attention to details, and imagination. Auyeung and et al achieved the retest validity of 0.85 and the internal consistency of 0.97 by the use of Cronbach's coefficient. The internal consistency of 5 scales of AQ was also satisfactory (Auyeung, Baron-Cohen, Wheelwright and et al, 2007). This questionnaire was standardized by NejatiSafa, Kazemi, Alaghand (2003) in Tehran University of Medical Sciences. The reliability was studied through the use of test-retest method, and an adequate Pearson correlation coefficient was achieved ($r= 0.82$, $p< 0.05$). Cronbach's alpha for the internal consistency of the whole items with each other was 0.76 and/or the overall score was 0.79.

Results

The current research was conducted with the aim of studying the correlation between the autism severity of parents having autistic children and their children's morbid symptoms. According to the research plan, the multiple regression method was used for data analysis and the achieved results of this analysis are provided in below tables.

The calculated correlation coefficient between paying attention to details and children's autism disorder at level $P<0.05$ is positive and significant ($r= 0.158$, $P= 0.013$). In other words the more the parents pay attention to the details the more the children's autism disorder will be and the calculated correlation coefficients between the social skills and children's autism disorder ($r= 0.048$,

P= -0.118) at level $P < 0.05$, shift of attention and children's autism disorder ($r = -0.140$, $P = 0.024$) at level $P < 0.05$, relationship and children's autism disorder ($r = -0.242$, $P = 0.000$) at level $P < 0.01$ and imagination and children's autism disorder ($r = -0.108$, $P = 0.039$) at level $P < 0.05$ were negative and significant. In other words the more these items reduce in parents the more the children's autism disorder will be.

Table 1: Matrix of Correlation Coefficient of Variable of Children's Autism Disorder and the Predictor Variables

Variables	Paying attention to details	Social Skills	shift of attention	Relationship	Imagination
Children's Autism Disorder	*0.158	*-0.118	*-0.140	** -0.242	*-0.108
Predictor Variables					
Paying attention to details	-			-	
Social Skills	-0.070	-			
shift of attention	0.056	**0.370	-		
Relationship	** -0.278	**0.256	**0.226	-	
Imagination	*-0.141	**0.304	**0.490	**0.449	-

* $P < 0.05$, ** $P < 0.01$

Table 2: Multiple Correlation Coefficient and the Squared Multiple Correlation of Variables of Imagination, Paying Attention to Details, Relationship, Shift of Attention, Social Skills in Predicting Children's Autism Disorder

Variable	Model	Predictor variable	Multiple correlation coefficient	Squared multiple correlation coefficient	Adjusted squared multiple correlation coefficient	F coefficient (5,194)	Significance level
Children's autism disorder	1	Imagination, paying attention to details, relationship, shift of attention, social skills	0.327	0.107	0.084	4.634	0.001

Multivariate regression model of two arranged collections using the method of simultaneous partial correlation has been used and the results are shown in table 2.

According to the findings of table 2 it could be concluded that the components of parent's autism severity are significantly effective on the changes of children's autism disorder ($R^2 = 0.107$, $F = (5,194) = 4.634$, $P = 0.001$) these findings show that individuals whose parent's autism severity components scores are high, the autism disorder in those children are higher. The achieved results for determining the regression analysis coefficients and determining the power of significant prediction for the independent variables and arranging the regression equation are provided in table 3.

Table 3: Standard & Non-standard Regression Analysis Coefficients for Predicting Children's Autism Disorder

Variable	Model	Statistical index Predictor variable	Non-standardized coefficients	Standard error	Standardized coefficient	t	Significance level
		Fixed No.	10.755	1.353	-	7.948	0.000
		-Paying attention to details	0.254	0.145	0.126	1.756	0.081
Children's Autism Disorder	1	-Social skills	-0.099	0.169	-0.044	-0.588	0.558
		-Shift of attention	-0.305	0.140	-0.178	-2.175	0.031
		- Relationship	-0.465	0.147	-0.251	-3.172	0.002
		- Imagination	-0.378	0.152	-0.212	-2.487	0.014

According to the table 3 results and significance of F in table 2, and t in above mentioned table the equation for predicting the children's autism severity from the amount of variables of parent's autism severity is as follows:

Predicting the children's autism disorder = $10.755 - 0.305$ (shift of attention) $- 0.465$ (relationship) $- 0.378$ (imagination)

Based on the slope amount, the less the shift of attention, relationship and imagination in parents the more autism disorder is predicted for children. The indicators provided in table 4 show the relative strengths of each predictor.

Table 4: Bivariate and Partial Correlations of Predictors with Children's Autism Disorder

Variable	Bivariate correlations	Partial correlations
Paying attention to details	*0.158	0.125
Social skills	*-0.118	-0.042
Shift of attention	*-0.140	*-0.154
Relationship	** -0.242	** -0.222
Imagination	*-0.108	*-0.176

As it is observable all of the bivariate correlations between the amounts of autism severity and children's autism disorder are significant ($p < 0.05$) and the partial correlations in shift of attention, relationship and imagination are also significant. Based on this correlation analysis it could be concluded that the predictor of parent's autism severity by itself predicts 11% of the changes in children's autism disorder ($R^2 = 0.107$).

Table 5: Matrix of Correlation Coefficient of Parent's Autism Severity Variable and the Predictable Variables

Predictable Variables	Parent's Autism Severity
Hyperactivity	*0.172
Oppositional behavior	0.095
Behavior disorder	*0.160
Anxiety disorder	**0.241
Morbid fears and obsession	**0.551
Tic	**0.199
Schizophrenia	*0.158
Depression	0.030
Social fear	**0.244
Separation anxiety disorder	0.095
Enuresis	**0.451

*P< 0.05 , **P<0.01

According to table 5 the calculated correlation coefficient between the parent's autism severity and hyperactivity ($r= 0.172$, $P= 0.015$) at level $P<0.05$, behavior disorder ($r= 0.160$, $P= 0.024$) at level $P<0.05$, anxiety disorder ($r= 0.241$, $P= 0.001$) at level $P<0.01$, morbid fears and obsession ($r= 0.551$, $P= 0.000$) at level $P<0.05$, social fear ($r= 0.244$, $P= 0.000$) at level $P<0.01$ and enuresis ($r= 0.451$, $P= 0.000$) at level $P<0.01$ are positive and significant. In other words the more the severity of autism in parents the more the above mentioned problems will be, but based on the calculated correlation coefficients no significant correlation exists between the parent's autism severity and oppositional behavior ($r= 0.095$, $P= 0.180$), depression ($r= 0.030$, $P= 0.677$), Separation anxiety disorder ($r= 0.095$, $P= 0.183$).

Conclusions

According to the current research findings the achieved results show that paying attention to details have a positive and significant correlation with children's autism disorder. The studies conducted by Baron-Cohen, Wheelwright, Skinner and et al in 2001 that are consistent with the current research results showed that relatives of children suffering from autism have considerable scores in this component compared to the parents having normal children. But in the research of Bishop, Maybery, Maley and et al (2004) the autism severity in the factor of paying attention to details achieved lower scores in comparison to 4 other factors and this is inconsistent with the current research results.

Other research result indicates that a negative significant correlation exists between the social skills and children's autism disorder. According to Kanner, parents describe the autistic children as cold, uninterested to relationships and unresponsive in terms of affections (Eisenberg and Kanner, 1956).

Shift of attention is another index of autism severity. A part of abnormal processes of attention in autism is accompanied by problems in understanding the meaning of environmental movements, and this will result in weakness in choosing clues in the environment which are provided unclearly and vaguely, and the individual tends to pay too much attention toward a special stimulus in order to dominate one's surrounding and control it (Mihrabzadeh, 2001). Baron-Cohen research results indicate the weakness in shifting the attention in parents and relatives of children suffering from autism and this by itself is probably an explanation for inheriting and genetic transfer

of autism features but with less severity in parents. Problems of shift of attention are observable in parents having autistic children which mean that they cannot easily focus their attention from one stimulus to another (Sucksmith, Roth, Hoekstra, 2011).

In autism severity the factor of relationship was studied as well. According to the achieved results of this research a negative and significant correlation exists between the relationship and the children's autism disorder. Piven, Palmer, Jacobi (1997), Ruser, Arin, Dowd and et al (2007) showed that biological parents of children suffering from autism achieved lower scores in relationship factor compared to the two other clinical and non-clinical control groups. In the researches of Bishop, Maybery, Maley and et al (2004) and Whitehouse, Maybery, Durkin (2007) it was shown that parents having autistic children achieved higher scores in relationship sub-scales compared to the clinical and non-clinical control groups (quoted by Scheeren and Stauder, 2008) which are inconsistent with the current research results.

In surveying the parent's autism severity, both imagination and non-flexible thoughts are studied as well. Non-flexibility could be considered as a factor for feeling flustered and individuals' disorganization at the time of occurrence of a change in the environment. These individuals show a wide range of obsessive and repetitive behaviors just like performing some ritualistic ceremonies which are much like stereotypes (Samadi and McKenna, 2011). Other result showed that the correlation between imagination and children's autism disorder is negative and significant. It could be stated that the problem of reciprocal social interactions and weakness in empathy are parallel and overlapping, thus the autism spectrum disorders are also called empathy disorders (Baron-Cohen, Wheelwright, Skinner, 2001). Sucksmith, Roth, Hoekstra (2011) showed that the empathy weaknesses of self-report in fathers are a part of broad autism phenotype. The important and common point in all of the sub-scales of autism severity questionnaire is broad autism phenotype. BAP refers to a group of communicational features and subliminal social skills and unusual personality traits which are observable in relatives of individuals suffering from autism and it seems that this is the milder aspect of character features of this disease (Constantino, Lajonchere, Lutz and et al, 2006; Rutter, 2000). Kanner and Asperger in their researches stated that parents having autistic children have behavioral features that are the same as their children's features (Kanner, 1943). Sasson, Lam, Parlier and et al (2013) indicated the existence of BAP with lower intensity of autistic behaviors in them.

Parent's personality traits is one of the determinant factors of severity of children's autistic behaviors (Sasson, Lam, Parlier and et al, 2013) at the end of the researches show that in relatives having autistic children, the BAP is obviously observable. When the genetic factors were recognized in etiology of autism this possibility exists that some of the family features may indicate a milder phenotype of this disease (Sasson, Lam, Parlier and et al, 2013).

Based on the current research collected data a positive and significant correlation exists between the parent's autism severity and the children's hyperactivity. The autism disorder has a high overlap with ADHD disorder to the extent that in recognizing these two disorders narrow lines exist for recognizing mistakes. In a research conducted by Ronald, Edelson, Asherson and et al in years 2010 and Ronald, Simonoff, Kuntsi and et al 2008 the overlapping of these two disorders were proved. Other result of the research showed that a positive and significant correlation exists between the parent's autism severity and the children's behavior disorder. Based on the conducted researches by Geier, Kern, Geier (2012) about studying the problems of mental health of autistic children, their behavioral problems were estimated and it was 89%. This possibility could be stated that due to the autistic indicators with different severities in parents of children suffering from autism in indicators such as communicational fields and inflexible thoughts and lack of empathy with others, cold and stiff character (Losh, Klusek, Martin and et al, 2012) and extending these behavioral

features to parenting methods and on the other hand the genetic transfer factor of these elements to children they cause to increase the possibility of correlation between the children's behavior disorder and parent's autism severity.

Existence of a positive and significant correlation between the parent's autism severity and the Generalized Anxiety Disorder phobias and thinking-practical obsession, social morbid fears are some of the other results of the current research. Since the parents of autistic children have high severity in the index of paying attention to details the obsessive behaviors are observable in such individuals and their children. Perhaps possibly the autistic children experience more severities in paying attention to details than their parents and according to their surrounding environment meet this index. In the conducted researches on the autistic children the obsessive behaviors have been estimated 92% (Geier , Kern, Geier , 2012). Van ,Bögels , Perrin (2011) acquired some evidences about the increasing risk of anxiety disorders in autistic children. In this study, the amount of specific phobia was evaluated 28%, obsession 17.4% and social anxiety was 16.6%. A significant correlation existed between the autism disorder and anxiety disorder. In between possibly by considering the BAP in relatives and especially the parents it is one of the important and essential factors in explaining the anxiety disorders such as obsession.

Another result indicates that a positive and significant correlation exists between the parent's autism severity and the children's tic. In terms of diagnosing tic and its different types have narrow boundaries, because sometimes they are mistakenly taken as stereotyped behavior in autism. In this research most of the autistic children were suffering from this disorder. The important point is that the stereotyped behavior in children is a subset of imagination and inflexible thoughts. By focusing on the conducted researches we can see the defect in imagination and existence of inflexible thoughts in both parents and autistic children (but with different levels of severity). It must be mentioned that although probably parents themselves have some levels of autism severity which have less clinical aspects than the autism disorder, the autistic children of such parents have higher levels of severity in coping with this disorder.

Other research finding showed the positive and significant correlation between the parent's autism severity and the schizophrenic children. Studies of Wolff, Narayan, and Moyes (1998) in relation to the parents of autistic children showed that parents of children suffering from autism especially fathers have significant schizoid traits. Studies of Burbach and Van der Zwaag (2009) showed that a few chromosomes and genes are common in these two disorders. In this research a significant correlation was achieved between the parent's autism severity and the children's enuresis. Parents of children suffering from autism have some biological-psychological characteristics such as higher rejection, freedom and excessive support (VahdatTorbati and GhobariBonab, 2001) and also indecency and irresponsibility is observable in them (Piven, Wzorek , Landa and et al ,1994). These characteristics could be considered as probable predisposing factors.

The current research findings could be considered as important findings for explaining the cause and nature of autism disorder and its overlap with other disorders. This research studied variables such as autism severity, BAP and morbid symptoms of children suffering from autism which up to now have been neglected by other researchers. It could be said that the most important aspects of parent's autism severity is their weakness in communicational skills and paying attention to details. In researches it has been shown that parents have the same weakness and defect in 4 aspects of autistic indices the same as their children but with minor severity. On the other hand, studying the morbid symptoms of autistic children showed that disorders such as anxiety, hyperactivity, obsession, enuresis, schizophrenia and tic have significant correlation with autism severity of parents having autistic children. In order to make the research findings more scientific and according to the necessities of conducting this research it is suggested to design a treatment plan

for creating correlations between parents-child in order to improve the relationships of autistic children and accelerating the healing process of such patients. If parents become aware of their weaknesses and genetic factors of the disease they could make decisions with more information in the field of giving birth to new children, treating the autistic children and/or take some steps for enhancing their social skills.

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