Mental health symptoms in siblings of children with Attention Deficit/Hyperactivity Disorder and Autism Spectrum Disorder

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Abstract

Aim. *To investigate if the siblings of the children with an Autistic Spectrum Disorder (ASD) and of those with Attention Deficit/Hyperactivity Disorder (ADHD) represent a group of risk for psychopathology.*

Method*. We studied 100 healthy siblings: 32 of the ADHD children (mean age10y and 2 mo, SD 2y 9mo), 35 of children with ASD (mean age 11 y 4mo, SD 3y 6 mo), 33 of normal development children (mean age 9 y 7 mo, SD 2 y 7 mo). 161 parents filled Child Behavior Checklist (CBCL) for the healthy siblings.*

Results. *The siblings of ADHD children had more externalizing (attention problems and aggressiveness; p=0.057) and internalizing (anxiety, withdrawn; p=0,014) symptoms compared to the siblings of ASD children; siblings of ASD children had more anxiety, thought problems and also aggressiveness.*

Conclusions. *The siblings of ADHD children and those of ASD children could develop a psychiatric disorder, especially those of ADHD children.*

Key words: siblings, ADHD, Autism, mental health, children

1. Introduction

The bond between siblings is the most unique one from all human relationships, is the second one after the attachment bond between parents and children (Moore, Howard, McLaughlin, 2002) being one of the most important and long lasting relationship in a human's live (Baumann, Dyches, Braddick, 2005).

Most studies suggest that the presence of an Attention Deficit/Hyperactivity Disorder (ADHD) child is associated with different levels of family disturbance, a conflict relationship between parents and children which makes the parents lose control, a high level of parental stress and even parental psychopathology, especially when there are behavior disorders (Kendall, 1999; Conlon, Strassle, Vinh, Trout, 2008; Chi, Hinshaw, 2002; Johnston, Mash 2001; Barkley, 1997; Listug-Lunde, Zevenbergen, Petros, 2008).

Within the family of the ADHD children it has been given a little amount of attention to healthy siblings and to the relationship between all the children from the family (Hechtman, 1996). Most researchers generally found that the siblings of an ADHD child have a higher risk of emotional or behavior disorders (Baumann, Dyches, Braddick, 2005; Noller, 2005).

Some researches show that the siblings of an ADHD child feel like a victim, the victimization being connected to the destructive behavior and aggressiveness of the ADHD sibling and it is often minimized or treated with regardlessness by the parents (Kendall, 1999; Moore, Howard, McLaughlin, 2002; Jones, Welsh, Glassmire, Tavegia, 2006). The siblings of ADHD children have a high risk of behavior disorders and also emotional disorders as depression and anxiety.

An autistic child represents a permanent challenge for all family members, so that the siblings have to face the role and structure changes within the family, the lost of attention from the parents and the increasing stress and parental conflict (Pilowsky, Yirmiya, Doppelt, Gross-Tsur, Shalev 2004; Rivers, Stoneman, 2003).

A longitudinal study, which lasted for three years, that was performed on the siblings of the children that have pervasive development disorders and of those with Down syndrome (Fisman, Wolf, Ellison, Freeman, 2000) has shown that the siblings of the autistic children have more adaptation problem than those with siblings that have Down syndrome or those of the control group.

Other studies that were performed on the siblings of autistic children (Hastings, 2003) have shown that they have more behavior disorders even in colleague relationships, but they can develop a much bigger admiration towards the sick sibling, also the fraternity relationships are less conflictive and competitive (Kaminsky, Dewey, 2001).

Recently, there were investigated in more details some of the aspects connected to the experience of growing beside an autistic sibling. For example, Susan McHale (Harris, Glasber, 2003; McHale, 1999) has shown that between 6 and 15 years old the siblings have rather positive reactions connected to the experience of growing beside an autistic child, although some children have negative reactions. They are concerned about the future of the autistic child but they think that the parents have a favorable attitude towards him.

Feiges and Weiss (2004) suggest that anger, frustration, embarrassment, perfectionism, sorrow and gilt are the emotional consequences most frequently found in siblings of children with ASD (Feiges, Weiss, 2004).

The aim of the present study is to investigate if the siblings of the children with an Autistic Spectrum Disorder (ASD) and of those with Attention Deficit/Hyperactivity Disorder (ADHD) represent a group of risk for the development of psychopathologic disorders.

2. Method

There were studied siblings of the children with Autistic Spectrum Disorder and the siblings of the children with ADHD that have attended various recovery therapies in the specialized institutions from Timişoara. The control group was consisting of siblings of children with a normal development, which were scholars in Timişoara within two different schools.

The inclusion criteria for the study group were: the sick sibling was diagnosed by child psychiatrist from The Clinique of Psychiatry and Neurology for Children and Adolescents from Timişoara, the diagnostic according with DSM-IV criteria was Autism, Asperger Syndrome or Atypical Autism (with an IQ between 50-90, measured with standardized tests), and Attention Deficit/Hyperactivity Disorder (with an IQ between 60-90, also measured with standardized tests). The age of the healthy siblings was between 6 and 18 years old, the age of the sick sibling was between 2 and 18 years old; biological family, with both parents present, having at most 4 kids. The inclusion criteria for the control group were similar: ages between 6 and 18 years old; biological family, with both parents present, having at most 4 kids.

All parents consent the study participation by signing the Informed Consent Form, having the possibility to refuse the study participation at any time. The study was approved by the Ethical Committee of the University of Medicine and Pharmacy from Timisoara, Romania.

There were 100 children participating at this study, 32 were the siblings of the ADHD children with an mean age of 10 years and 2 months (10y2mo), Standard deviation (SD) 2y 9mo, 2 of them were the same age as the sick sibling (they were twins, but only one of them was diagnosed with ADHD); 35 of them were siblings of the children with ASD, they had an mean age of 11 y 4mo, (SD 3y 6 mo), one of them had a twin sibling which was the only one diagnosed with ASD (Asperger Syndrome); 33 siblings of the children with a normal development, with an mean age of 9 y and 7 mo (SD 2 y 7 mo).(Table I)

The parents of the children that were participating to the study have filled the Child Behavior Checklist (CBCL), the version for parents, regarding the behavior and emotional problems of the healthy sibling, that were grouped into two categories: internalizing symptoms (Anxious/Depressed, Withdrawn, Somatic Complaints, Social Problems, Thought Problems) and externalizing symptoms (Attention Problems, Delinquent Behavior, Aggressive Behavior). We expect the results to be sometimes different when both parents fill the CBCL because, when it comes to the children with disabilities, the mothers are the ones that are usually more involved in taking care of the sick child and have a higher level of stress, so they may have a different perspective on the behavior of the healthy child than the fathers have. A total of 161 parents have filled the questionnaire, from which 100 were mothers and 61 fathers. The independent variables which were taken into consideration for data processing were: age, the sex of the healthy sibling, the brotherhood order and the mental disease of the child: Autistic Spectrum Disorder, ADHD, or the normal development children.

The depending variables were the scores obtained through CBCL, when the data was processed the means of the scores (standard deviation) were taken into consideration.

There were analyzed the results obtained at the CBCL by the siblings that were a part of the study, as much for internalizing and externalizing problems as for the 8 symptomatic scales. The results were also analyzed by sibling's sex, the brotherhood order and age: taking into consideration two age groups: 6-11 years old, 12-18 years old. For the results comparison in the three groups it was used the One Way Analysis of Variance (ANOVAs).

For statistic data processing was used the program SPSS for Windows 17.0.

Table I: Demographic variables of study and comparison groups: siblings of ADHD children, ASD children and control group of normal development children

	ADHD (n=32) n (%)	**ASD** (n=35) n (%)	**Normal development** (n=33) n (%)
Sex : male/female	20 (63)/ 12 (37)	19 (54)/16 (46)	19 (57)/14 (43)
Age: mean (SD)	10y2mth (2y9mth)	11y4mth (3y6mth)	9y7mth (2y5mth)
Brotherhood order			
Bigger	15 (47)	24 (68)	21 (64)
Smaller	15 (47)	10 (28)	12 (36)
Twins	2 (6)	1 (2)	-
Parents			
Mothers	32 (60)	35 (66)	33 (60)
Fathers	21 (40)	18 (34)	22 (40)

3. Results

The mean score obtained at the internalizing and externalizing scales on CBCL shows that the behavior and emotional problems of the siblings of ADHD children are bigger comparing with those of the siblings of the ASD children and the ones of the siblings of normal development children (Table II).

Regarding the symptoms variation by age, for the siblings of the ADHD children, the mothers estimated that the internalizing symptoms grow with age (mean scores 16.21 at the age of 6-11 and 23.09 at the age of 12-18), while for the siblings of ASD children the mothers estimated that there are many more internalizing problems at the age of 6-11 (mean scores 20.5) comparing to the adolescence age (mean scores 11.26).

There were also found some differences between the behavior and emotional issues of the siblings by sex. Thereby, the mothers of ADHD children perceived more internalizing (mean scores 22.07) and externalizing problems (mean scores 25.71) at the boys comparing to the girls (mean scores for externalizing symptoms 15.63 and internalizing symptoms 15.27). Compared with the siblings of ADHD children, at the siblings of ASD children the situation is reversed, the sisters of ASD children being evaluated by the mothers as presenting more internalizing (mean scores 16.27) and externalizing (mean scores 19.63) symptoms in comparison with boys (mean scores for internalizing symptoms 13.92 and externalizing symptoms 13.42).

The results by brotherhood order show that the mother, as well as the fathers estimated that the bigger siblings have more internalizing and externalizing problems than the little ones, for all three categories of children that were a part of the study; yet, the bigger siblings of ADHD children have more internalizing (mean scores 22.33) and externalizing problems (mean scores 24.4) than the bigger siblings of ASD children (mean score for internalizing symptoms 15.29 and externalizing symptoms 16.62) which have more problems than the siblings of normal development children.

The differences between the scores of the symptoms of internalizing and externalizing within the three groups of siblings that were a part of the study, also had a statistic meaning, as resulted through data processing with One Way ANOVAs test (p=0.14/0.005 and p= 0.057/0.001) (Table III).

Analyzing the results for the 8 symptomatic scales gave us the results for the symptoms: anxious/depressed, withdrawn, somatic complaints, social problems, thought problems (internalizing symptoms) and attention problems, delinquent behavior, aggressive behavior (externalizing symptoms).

Also this time the parents estimate that the siblings of ADHD children have more symptoms compared to the siblings of ASD children and to those with a normal development, with insignificant

differences between mothers and fathers. At the siblings of ADHD children prevails anxious/depressed symptoms and withdrawn from the internalizing symptoms and aggressive behavior from the externalizing symptoms.

At the siblings of ASD children prevails the anxious/depressed symptoms and thought problems from the internalizing symptoms and also aggressive behavior from the externalizing symptoms (Table II).

The differences of the scores that parents got at some of the siblings symptoms also had a statistical meaning, as resulting from the data processing with the One Way ANOVAs test (Table III).

From data analyzing the symptomatic categories by age shows that as a young scholar (6-11 years old) the siblings of ASD children have a higher level of anxious/depressed symptoms (mean scores 10.33), withdrawn (mean scores 7.14), thought problems (mean scores 4.83) beside aggressive behavior (mean scores 16.4), and the siblings of ADHD children have more aggressive behavior (mean scores 11.69) and attention problems (mean scores 7.07); at older ages, the siblings of ADHD children have higher levels of anxious/depressed symptoms (mean scores 10.8), withdrawn (mean scores 15.85) and aggressive behavior (mean scores 11.27), while the siblings of ASD children had a lower level at all symptoms (mean scores < 4).

Regarding the results by sex, the brothers of the ADHD children have higher scores at anxious/depressed symptoms (mean scores 6.5), withdrawn (mean scores 9.35) and specially attention problems (mean scores 8.35) and aggressive behavior (mean scores 14.05) while the sisters have more somatic complaints (mean scores 7.44) and anxious/depressed symptoms (mean scores 5.50); the brothers of the ASD children also have high levels of aggressive behavior (mean scores 9.94), while the sisters of those children, beside aggressive behavior (mean scores 9.5) also have higher levels of anxious/depressed symptoms (mean scores 7.06), and somatic complaints (mean scores 6.69) compared to the boys.

By brotherhood order, the results show that the bigger siblings of ADHD children and also of ASD children have more anxious/depressed symptoms (mean scores 9.12 /8.06), withdrawn (mean scores 13.0/5.16), and also show more attention problems (mean scores 7.73/6.59)]. Small siblings of ADHD children have more somatic complaints (mean scores 6.41) and a higher aggressive behavior (mean scores 9.85) while those of ASD children are just more aggressive (mean scores 11.0).

Table II. Mean scores (SD) of CBCL scales for the three group of children: siblings of ADHD children, ASD children and control group of normal development children

CBCL symptoms	ADHD Mean, (SD) Mother/Father	ASD Mean, (SD) Mother/Father	Normal development Mean, (SD) Mother/Father
Internalizing	19.24 (11.5)/ 18.12 (10.8)	14.96 (11.6)/ 9.54 (9.6)	12 (8.28)/13.53 (13.3)
Externalizing	21.12 (12.4)/ 22.56 (14.3)	16.16 (16.5)/ 7 (9)	12.78 (12.7)/ 14.13 (15.2)
Anxious/depressed	6.08(3.07)/6.05(3.7)	6.32(4.23)/3.44(2.5)	4.4(3.04)/6.21(4.47)
Withdrawn	7.62(8.25)/8.15(7.84)	4.36(2.87)/2.8(3.03)	3.48(2.81)/2.82(1.18)
Somatic complains	5.16(2.83)/3.73(2.72)	2.62(1.9)/2.62(1.99)	2.64(1.93)/6(7.5)
Social problems	2.13(1.45)/2.87(2.1)	2.5(1.5)/2(1)	1.93(0.95)/1.7(0.48)
Thought problems	4.05 (2.3)/ 3.14(1.92)	3.92(3.05)/6.5(3.41)	2.16(1.32)/2.4(1.34)
Attention problems	7.28(4.69)/7.78(4.34)	5.53(3.96)/4.11(4.62)	4.33(3.38)/5.06(3.02)
Aggressive behavior	11.64(6.45)/11.31(7.81)	9.74(7.97)/6.18(3.73)	7.36(6.03)/8.36(7.84)
Delinquent behavior	4.86(2.26)/4.46(2.29)	3.31(3.05)/2.25(1.5)	4.14(5.36)/4.55(6.5)

Table III. One Way ANOVAs' results. Comparison between the three groups of children: siblings of ADHD children, ASD children and control group of normal development children

CBCL Symptoms	ADHD-ASD p value Mother/Father	ADHD-normal p value Mother/Father	ASD-normal p value Mother/Father
Internalizing	.014/.005	.000/.112	.314/.252
Externalizing	.057/.001	.001/.064	.241/.150
Anxious/depressed	.825/.071	.060/.917	.072/.107
Withdrawn	.083/.153	.021/.009	.293/.979
Somatic complains	.000/.309	.003/.236	.977/.233
Social problems	.528/.407	.661/.104	.261/.438
Thought problems	.893/.038	.073/.303	.195/.042
Attention problems	.112/.050	.012/.042	.240/.539
Aggressive behavior	.295/.049	.010/.236	.186/.394
Delinquent behavior	.111/.094	.656/.962	.624/.507

4. Discussion

The specialized literature show us contradictory results on a variety of psychological, social and cognitive effects related to the way in which the healthy sibling is affected by the health condition and behavior of the disabled sibling.

It's relevant to mention that in most of other studies the siblings and families of ASD children were analyzed compared to the siblings of children with mental retardation or Down Syndrome while the siblings and families of the ADHD children were analyzed in comparison with the siblings with normal development or with learning disorders; the specialized literature show that the siblings of ASD children and those of ADHD children have been rarely studied together, therefore in our study many of the results are different.

Faraone and collaborators (Faraone, Biederman, Mennin, Gershon, Tsuang, 1996) performed a longitudinal study, which lasted for 4 years, on the siblings of ADHD children. They found that those children have a higher risk for psychopathology, using CBCL. Compared to the control group, the siblings of ADHD children had more behavior and mood problems, anxiety and a high rate of school failure.

In our study, the siblings of ADHD children shown more internalizing and externalizing problems in comparison with both siblings of ASD children and the ones of the normal development children, which leads to even more adapting difficulties related to disruptive behaviors of the siblings with ADHD.

The results gathered by us on internalizing and externalizing symptoms show that the siblings of ADHD children have more behavior and emotional problems compared to the siblings of ASD children, and those have more problems than the siblings with a normal development; there are predominant problems on boys with ADHD, the problems increasing with age. Behavior and emotional problems of the siblings of ASD children are more intense on the girls, most on the age of 7-11 years old. Till now there haven't been many studies in which these two groups of siblings can be compared, so that our results can only be compared with the data obtained generally by the literature, separately for the siblings of ADHD children as well as the siblings of ASD children.

The studies performed on the families of ADHD children, of those with autism or with learning disorders show that the siblings receive less warmth, closeness or satisfaction from the brotherhood relationship than the siblings of the healthy children. Furthermore, those siblings are the ones that have high levels of anxiety, depression, aggressiveness, worries about the future, low self-esteem, sense of rejection from the parents, shame or embarrassment in their trying of hiding the sibling's difficulties from their

friends, in order to avoid to be teased or assaulted at school. They might also have behavior problems, maybe because of the anxiety and the rejection of others or because sometimes they copy their sibling's behavior (Gowers, Bryan, 2005; Kaminsky, Dewey, 2002).

In this study the siblings of ASD children had many more internalizing symptoms and also externalizing symptoms, as aggressiveness, their intensity being the biggest only at the scholar age, at pre-adolescence and adolescence the intensity of the symptoms fit into the normal limits. The sisters of ASD children had more symptoms in comparison with the brothers, these being the ones that had more caring responsibilities than the brothers, same as in other studies (Gowers, Bryan, 2005; Kaminsky, Dewey, 2002).

In what concerns the siblings of ADHD children the results of our study show that the healthy brothers and sisters have a higher risk especially in developing aggressive symptoms and attention problems and also in symptoms of anxiety and depression. The symptoms intensiveness of the siblings of ADHD children increases with age.

The results are congruent to the results of others studies which show that the siblings of ADHD children feel victimized, the victimization being connected to aggressiveness and destructive behavior of the ADHD sibling and often minimized or unnoticed by the parents (Moore, Howard, McLaughlin, 2002; Kendall, 1999). The siblings of ADHD children have a high risk of behavior disorders as well as emotional ones, as depression and anxiety. Over time, the adapting difficulties of the healthy siblings may increase; this can explain why in our study the internalizing and externalizing symptoms of the siblings of ADHD children at the age of 12-16 years old have gathered higher scores.

Even if the brotherhood relationship is a close and warmth one in early age of childhood, in adolescence this may change. The level of dominance and protection is reduced, as well as the time spent together, the intimacy and the affection from the bigger sibling, possibly increasing the conflict level with the small sibling. This study show that the big siblings of ADHD children and those of ASD children have more internalizing symptoms, but also show more attention problems and aggressiveness.

Moser (Moser, Jacob, 2002) also revealed that sometimes the behavior of the siblings may predict the psychological symptoms, the conflict between siblings predicting depression and anxiety, and this is happening even when the parental education is properly.

Even if the main limit of the study was the relatively small number of children that were a part of it, using the CBCL and analyzing the results by age, sex brotherhood order allowed us to get an overall image regarding this matter, many of the results being congruent with the literature data. Another main limit is that many of the fathers did not take part of the study, so that the significant difference between the perception of the mothers and of the fathers over the children's matter can't be conclusive. The small difference between the CBCL scores of the mothers and those of the fathers may be related to the fact that there were fewer fathers that participated as well as the fact that, many times, the fathers spend less time with children or they may have a denial attitude regarding their problems.

Even though the study lasted for three years, the study was cross-sectional, the working tool being applied to the children only once because of the difficulties encountered in collecting the cases. Recent studies on siblings of children with disabilities show the importance of the studies with a longitudinal design, the evolution of emotional and/or behavior problems of the healthy siblings being connected to the developmental stage in which those children are (Gray, 2002; Hastings, 2007).

In this study we tried to analyze to what extent can the siblings of ADHD children and those of ASD children develop some behavior and emotional problems as a reaction of the experience of growing beside a child with one of the two conditions. Even if those two disorders seem to be very different, through their evolution and prognosis, the results gathered trough the study show that the siblings of ADHD children

as well as those of ASD children may face some adapting problems, manifested through some symptoms of psychopathology and becoming a category of children with a risk of developing a psychiatric disorders.

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Abbreviations

ADHD: Attention Deficit/Hyperactivity Disorder
ASD: Autistic Spectrum Disorder
CBCL: Child Behavior Checklist
SD: standard deviation
Y: year; mo: month