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Comorbidity of psychiatric disorders in attention deficit/hyperactivity disorder

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Abstract

Background and Objectives: Attention Deficit/Hyperactivity Disorder (ADHD) occurs concurrently with many psychiatric disorders. Considering lack of information about comorbid psychiatric disorders in Iranian children, this study was performed to evaluate the prevalence and pattern of psychiatric disorders comorbidity in the children with ADHD.

Methods: In a cross sectional study, frequency of comorbid psychiatric disorders in a randomly selected sample of children with definitive ADHD referred to child and adolescent psychiatry clinic of Kashan University of Medical Sciences, Iran, was determined through clinical interview using Kiddie's Schedule for Affective Disorders and Schizophrenia.

Results: The mean age of participating children was 7.35±1.23 years and 132(66%) children were boy. Among 200 children, 107 (53.5%) had at least one comorbid psychiatric disorder which Obsessive-Compulsive Disorder was most prevalent psychiatric disorders following with Enuresis, and Oppositional Defiant Disorder respectively. There were statistically significant relationships between age and the type of comorbid psychiatric disorders.

Conclusion: Considering the high prevalence of psychiatric disorders comorbidity such as OCD, Enuresis and ODD in children with ADHD, precise diagnosis and proper treatment is essential. More studies are recommended for detection and proper treatment of these psychiatric disorder comorbidities.

Keywords: Attention Deficit Hyperactivity Disorder, Comorbidity, Psychiatric Disorder

Background

Attention Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder and it has been reported in 8.6 percent of Iranian children and adolescents (1). The prevalence of ADHD varies across studies. When diagnostic criteria such as DSM are used, prevalence rates are between7-10% of children (2) and 2.5 to 5.5% of adult (3). Gender play a significant role in determining prevalence of ADHD in the childhood population. In epidemiological samples, male children are between 2.5-5.6 times more likely than female children to be diagnosed as ADHD with the average being roughly 3:1 (4). within clinic-referred samples, the gender ratio can be considerably higher. This is probably because boys are more likely to have a comorbid conduct disorders (5). These comorbidities may cause correct diagnosis and treatment troublesome and may be different in males and females and need different therapeutic programs (6). Two thirds of US children with ADHD have comorbid conditions. Social and educational functioning declines with more commodities. Clinical management of ADHD must address multiple comorbid conditions (7).

The frequency of different comorbid disorders in the children with ADHD has been reported differently (8-11). In a study was done in Rio de Janiro (2005), 23% of children with ADHD had comorbid anxiety disorders which most prevalent anxiety disorders reported were generalized anxiety disorder (GAD), separation anxiety disorder (SAP), and social phobia respectively (8). In another study performed by Adler et al., comorbid psychiatric disorders were reported as follow: 32% depressive disorders, 21.2% Bipolar Mood Disorder and 9.5% anxiety disorders (9). In a study was done by Dilsaver, among 104 children with ADHD 59.6 % had mood disorder (10).

In a review, 35% of children with ADHD had comorbid conduct disorder (CD) and 26% had concurrent oppositional defiant disorder ODD (11).

Few studies have been performed regarding pattern of comorbid psychiatric disorders among children with ADHD in Iran. In a study 12.7% of boys and 7.9% of girls with ADHD had depressive disorders, 32.4 of boy and 26.3% of girls had enuresis and 29.6 % of boys and 16 % of girls had anxiety disorders (12). Another study reported enuresis in ADHD has a relationship with ODD and only ODD comorbidity was the predictor of enuresis in these children (13). In the best knowledge of the authors, there is not any other, recent study regarding the frequency and pattern of comorbid psychiatric disorders in the children with ADHD. Therefore, the researchers decided to evaluate the frequency and type of comorbid psychiatric disorders in the children with ADHD referred to outpatient child psychiatry clinic of Kashan University of Medical Sciences in Kashan, Iran.

Methods

Participants

In a cross sectional study, 200 children with ADHD who referred to outpatient child and adolescent psychiatry clinic of Kashan University of Medical Sciences in Kashan, Iran (2015) were selected using randomized sampling. Inclusion and exclusion criteria were: children with 5-14 years old had not mental retardation and disability. All of the 5- 14-year-old children were interviewed by a board-certified child and adolescent psychiatrist and diagnosis of ADHD was documented using DSM-IV-TR criteria and Kiddie's Schedule for Affective Disorder and Schizophrenia (K-SADS). All of the children, who had apparent organic disorders (such as visual or hearing deficits, seizure disorders, past history of head trauma, and any acute or chronic medical disorders) and mental retardation according to their history, were excluded from the study. The parents of all of the participants gave written consent form.

Instruments

The comorbid psychiatric disorders in the selected children were evaluated by child and adolescent psychiatrist through clinical interview by using K-SADS which is a semi-structured diagnostic interview to assess current and past episodes of psychopathology in children according to DSM-III-R and DSM-IV criteria. Probes and objective criteria are provided to rate individual symptoms. The K-SADS-PL is administered by interviewing the parents, the child, and finally achieving summary ratings which include all sources of information. Reliability and validity of the Persian translation has been established in Iran (13).

Data analysis

The obtained data regarding comorbid psychiatric disorders and other variable include age and gender were analyzed using SPSS 16.0 software and Chi Square and Fisher's exact tests. P value ≤ 0.05 was considered significant.

Results

In this cross-sectional study, comorbid psychiatric disorders were evaluated in 200 children with ADHD. The mean age of the participants was 7.35±1.23 years, 68 (34 %) were female and 132 (66 %) were male.

Table 1. Comorbid psychiatric disorders in the studied children with Attention Deficit/Hyperactivity Disorder.

Comorbid Disorder		N (%)
Disruptive Behavior Disorders		45(22.5)
	Oppositional defiant disorder	27 (13.5)
	Conduct	18 (9)
Obsessive Compulsive Disorder		31(15.5)
Enuresis		30 (15)
Learning Disorder		20 (10)
Anxiety Disorders		16 (8)
	Generalized and Separation Anxiety Disorders	9 (4.5)
	Specific Phobia	7 (3.5)
Mood Disorder		14 (7)
	Bipolar Mood Disorder	10 (5)
	Major Depressive Disorder	4 (2)

Table 2. Frequency of comorbid psychiatric disorder in the children based on age group

Age group	With comorbidity (%)	Without comorbidity (%)
5-9 y/o (n=167)	86 (51.5)	81(48.5)
10-14 y/o (n=33)	21(63.6)	12(36.4)
Total (n=200)	107(53.5)	93(45.5)

Table 3. Frequency of comorbid psychiatric disorders among the children in different age groups

Comorbid Disorder	5-9 years (%)	10-14 years (%)	p value
Obsessive-Compulsive Disorder	31 (18.6)	0 (0)	0.002
Enuresis	24 (14.4)	6 (18.2)	NS
Oppositional Defiant Disorder	22 (13.2)	5 (15.2)	NS
Learning Disorder	20 (12)	0 (0)	0.022
Conduct Disorder	11 (6.6)	7 (21.2)	0.015
Bipolar Mood Disorder	7 (4.2)	3 (9.1)	NS
Generalized and Separation Anxiety Disorders	6 (3.6)	3 (9.1)	NS
Phobias	4 (2.4)	3 (9.1)	NS
Major Depressive Disorder	2 (1.2)	2 (6.1)	NS

Prevalence of comorbid psychiatric disorders with ADHD was 53.5 % (107 cases). The most prevalent psychiatric class comorbidity was Disruptive Behavior Disorders including ODD and Conduct, Obsessive-Compulsive Disorder (OCD), and enuresis. The most frequent psychiatric disorders were OCD, enuresis and Oppositional Defiant Disorder respectively (Table 1).

Psychiatric disorders were compared between age groups (5-9, 10-14 years old) which are summarized in Table 2. Comorbid psychiatric disorders were recorded in 51.5 % of the 5-9 years-old age group and 63.5% of the 10-14 years-old age group. There was no significant difference of psychiatric comorbid disorders frequency between the two age groups ($p> 0.05$). However, frequencies of OCD, CD, and learning disorder (LD) were significantly different between two age groups. Conduct disorder (CD) was more frequent in 10 to14 year-old age group but OCD and LD was observed more frequently in 5 to 9 year-old age group (Table 3).

Based on gender, 51.5% of girls and 54.5% of boys had comorbid psychiatric disorders. There was not any statistically significant difference in overall frequency of comorbid psychiatric conditions between girls and boys ($p> 0.05$). The frequencies of different psychiatric disorders and its comparison were summarized in Table 4.

We tried to study the frequency of more than two psychiatric disorders that can occur concurrently in the ADHD children. In children with ADHD, 34.5% had one comorbid disorder, 14.5% had two comorbid psychiatric disorders, 4.5% had three of the comorbid psychiatric disorders with ADHD. However due to small sample size and variability of these concurrent comorbid conditions, statistical analysis was not possible.

Discussion

The higher frequency of comorbid psychiatric disorders with ADHD in male participants was a predictable finding that is compatible with the previous studies (1-7, 17). This difference may be due to gender ratio in the studied population (boy/girl: 2/1).

The overall frequency of psychiatric disorders

Table 4. Frequency of comorbid psychiatric disorders based on gender

Comorbid Disorder	Female (%)	Male (%)	p value
Obsessive-Compulsive Disorder	14 (20.6)	17 (12.9)	0.112
Enuresis	10 (14.7)	20 (15.2)	0.055
Learning Disorder	7 (10.3)	13 (9.8)	0.551
Oppositional Defiant Disorder	5 (7.4)	22 (16.7)	0.050
Generalized and Separation Anxiety Disorders	4 (5.9)	5 (3.8)	0.364
Conduct Disorder	3 (4.4)	15 (11.4)	0.082
Major Depressive Disorder	2(2.9)	2(1.5)	0.419
Phobias	2 (2.9)	5 (3.8)	0.555
Bipolar Mood Disorder	2 (2.9)	8 (6.1)	0.278

in the present study was 53.5%. In similar studies this frequency has been reported with great variability (7,15-18). Larson study in USA reported 67% of children with ADHD had at least one other neurodevelopmental disorder (7). In Kadesjo & Gillberg study, as many as 87% of clinically diagnosed ADHD children in Swedish schools may have at least one other disorder and 67% have at least two other disorders (15). Ghainzadeh et al. reported 92.4% boys and 78.3% of girls with ADHD had comorbid psychiatric disorders (17). We found a lower frequency of comorbid psychiatric disorders in the studied children. This lower frequency may be due to differences in the studied population and methodology includes exclusion criteria such as mental retardation and seizure disorder, cultural and geographical differences in reporting some clinical manifestations.

The most prevalent comorbid class of psychiatric disorder in the present study was Disruptive Behavior Disorders (DBD). This finding is similar to other studies (16-21). Anxiety disorders were observed in 8% of the children. This was slightly lower than the similar study by Souza et al., (8) and comparable with the findings of a study by Adler et al., (9). It seems the frequency of comorbid anxiety disorders in the children with ADHD should be considered as culture independent conditions that occur with similar frequencies in these children.

The frequency of mood disorders in our study was lower than similar studies (22-24). This frequency was comparable with study of Alavi et al. (1).

One of the most prevalent comorbid psychiatric disorder in our study was Obsessive-Compulsive disorder (OCD) that was observed in 15.5% of the studied patients, followed by enuresis, Oppositional-Defiant disorder (ODD) and Conduct disorder (CD). Higher frequency of OCD in the patients with ADHD, as compared to the study of Shams in adolescents of Iran (11. 2%) was an expected finding (25, 26). However, Frequency of OCD in studied population was too high (15.5%). This may be due to real high frequency of obsessive compulsive disorder in the population of Kashan that needs further studies in this city.

Within a few years Numerous studies, have reported significant rates of ADHD-OCD co-occurrence (27-29). Increased co-occurrence rates were found in children and adolescents as compared to adults. Extreme variability across studies was documented (0- 60%) (28). Moreover, according to the Executive Overload Model, ADHD-like symptoms may be present in OCD. An attempt to provide an etiological account for ADHD-OCD comorbidity, primarily genetic in nature was made only with regard to children (29). Mathews study, revealed significant correlation between OCD and ADHD (29). In a previous study by Alavi et al, (1) the frequency of ODD in a population based sample of children in the urban areas of Tehran was 7.3% and the frequency of OCD was 2.1 %. It was expected that the frequency of ODD to be higher in this sample of ADHD children. However, it should be considered that the pattern and distribution of psychopathologies in these two cities (with a distance of only about 220 kilometers) may be quite different. Kashan is a city with a population of about 300,000 people, a traditional culture, many familial marriages (like many of this sized cities of Iran) and powerful religious background but Tehran is multicultural metropolitan with a population of about 13 million coming from different parts of Iran with no special cultural dominance. The differences in cultural, economical and social conditions in these two cities may stand for the variability of psychological manifestations of youngsters in the two cities.

Frequency of Enuresis in our study was somehow similar to other studies (16, 18). Frequency of enuresis in a sample of general population was reported 8-19% (30-32). Considering the fact that the formal study was a population based one, we can conclude that enuresis is more prevalent in the children with ADHD who referred to clinics.

In the present study, frequency of CD was higher in the 10-14 years-old age group. This finding is similar to a study by Huh et al (33). They also reported a higher frequency of mood disorders in the adolescents. In the present study, the frequencies of Major Depressive Disorder (MDD) and Bipolar Mood Disorder (BMD) was insignificantly higher in 10-14 years-old age group which may be due to an increase in the frequency of conduct behaviors with growing and increased time to express traits of mood disorders with age.

There was a higher frequency of OCD among the studied girls and higher frequencies of CD and BMD among the studied boys. However, there were not any statistically significant differences in the frequencies of various psychiatric comorbid conditions between sexes.

The studied children were selected from child referred to outpatient clinic that may not repre-

sent all of the population of children and adolescent with ADHD. Small sample size is another limitation for the present study; maybe with larger sample size, some of the observed differences in gender distribution of some disorders would become significant.

Conclusion

Comorbid psychiatric disorders, such as OCD, enuresis and ODD should be considered in the management of a child or an adolescent with ADHD. It seems special attention to OCD in ADHD patients is essential due to high frequency of OCD among ADHD patients.

Conflicts of interest: None declared.

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