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RELATION BETWEEN ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) IN CHILDREN AND MATERNAL ANXIETY IN EGYPT

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ABSTRACT

Background & aim: According to the previous studies, mood and anxiety disorders are common among mothers of children with attention deficit hyperactivity disorder (ADHD). There is a viscous cycle between the effect of features of ADHD in children on the maternal anxiety state and the effect of anxiety on parenting skills of mother trying to control a child with ADHD. This study aimed to determine the relationship between maternal anxiety and ADHD in children in the Egyptian community as there is lack of data about this subject. **Methods:** This study was conducted on 60 mothers of ADHD children (aged 6-12 years), selected via convenience sampling from May 2017 till the end of August 2017. The subjects lived in Cairo government, with their children and were referred to Friends forever outpatient clinic. Structured clinical interview for the DSM-IV Axis I disorders **SCID- I**, Stat-Trait Anxiety inventory **STAI**, Hamilton Anxiety rating scale **HAM-A** and attention deficit hyperactivity disorder test **ADHD T** were completed by the subjects except HAM-A by the researcher. The collected data was revised, coded, tabulated and introduced to a PC using Statistical Package for Social Sciences (SPSS) software version 21. Data summarized using descriptive statistics, number and percentage for qualitative values and mean and standard deviation or median and interquartile range for quantitative variables. Parametric and non- parametric tests of significance will be used appropriately. P value equals or less than 0.05 will be considered significant. **Results**: Our data showed that 51.67% of mothers had severe anxiety state, 43.3% had severe anxiety trait and only 20% had moderate to severe anxiety measured by Hamilton anxiety rating scale. Also 26.6% of mothers are diagnosed with mood disorders and 23.3% are diagnosed with anxiety disorders. There are statistical significant correlations between the anxiety state and the ADHD subtype. **Conclusion:** The present study suggests that 100% of mothers showed anxiety state with different degrees. Mood and anxiety disorders are common among Egyptian mothers have a child with ADHD. There is a relation between the anxiety state of the mothers and the ADHD subtype in children.

KEYWORDS: Attention Deficit hyperactivity disorder, ADHD, maternal Anxiety, mothers.

INTRODUCTION

ADHD is a developmental disorder of executive functioning that impairs the ability to focus, increases impulsivity, and increases motor activity. The condition is usually diagnosed between the ages of 6 to 12, but symptoms can persist into adulthood.[1] Although the etiology of ADHD is not fully understood, genetic and neurologic factors play important roles.[2] In addition, ADHD is associated with deficits in brain structure, and neuronal functioning and connectivity, which appear to be correlated with ADHD severity.[3] The diagnosis of ADHD should be considered in patients four years or older with poor attention, distractibility, hyperactivity, impulsiveness, poor academic performance, or behavioral problems at home or at school. More boys have ADHD overall; however, the inattentive subtype is more common in girls.[4] No specific test can diagnose ADHD, and the DSM-5 requires the presence of a sufficient number of core symptoms and functional impairment. ADHD includes three subtypes: primarily inattentive (e.g., distracted, poor organization and follow-through); primarily hyperactive-impulsive (e.g., fidgety, overly active, interrupts); and combined. A positive family history for ADHD is supportive of an ADHD diagnosis. Physicians who inherit a patient with a previous ADHD diagnosis should review the diagnostic process and current symptoms and treatment needs. Rating scales should be included in the medical record to monitor progress and adjust treatment accordingly.[1] Medications may be considered if ADHD symptoms are moderate to severe and not responsive to behavioral therapy. Therapy should start with medications in

children six years and older. Behavioral treatments are also recommended for older children; however, they are particularly helpful if medication response is poor or associated with adverse effects.[5] Mothers of ADHD children tend to exhibit more controlling and less rewarding parenting[6] that may lead to anxiety and tension which may affect the relation between the children and the mother. Parents of ADHD children assess their family environment as less supportive and more stressful than the comparison group.[7] In another research, Durukan I evaluated the depressive symptoms, anxiety status and coping behaviors of mothers of 30 children with ADHD in comparison to 30 healthy controls. The Beck depression and anxiety scores of the mothers of ADHD sample were significantly higher than the controls.[8] Another study compared the rates of anxiety and depression in a sample of Brazilian parents; the sample included the parents of 26 ADHD Students and 31 paired controls. The results of this study indicated that mothers of ADHD children presented higher depression and anxiety levels.[9] Therefore, depression and anxiety in mothers of ADHD children can be one of the consequences of dealing with the problems of these children and in turn can exacerbate their behavioral challenges, making family environment more stressful. Considering the importance of the family as a building unit of the Egyptian community and the mother as the corner stone for family building this study is aimed to detect the anxiety state in mother caring with a child diagnosed with ADHD in Cairo City, Egypt.

Subjects and methods

This study is a prevalence study did by a convenient sampling; this is a specific type of non- probability sampling. All children and their mothers with inclusion criteria and agreed to share in the study were included started from the 1st of May 2017 till the end of August 2017. Participants were recruited from a private sector called Friends forever center. It is a center caring with mental health of children from 3-14 years old.

Sample size: The sample consisted of 60 mothers (25 years- 45 years) with their children aged between (6 to 12 years) old who had the clinical diagnosis of Attention Deficit Hyperactivity Disordere. Sample size based on literature review and as flow of patients in 3 months (about 20 patients per month) sample size is estimated to be 60 children and their mothers.

Selection of cases: All children who were brought to the clinic with chief complaints of inattention and hyperactivity were evaluated clinically and with ADHD-T (Attention Deficient Hyperactivity Disorder test) to confirm the diagnosis. The Inclusion criteria for the study were: For the children: **1.** Children diagnosed with ADHD by clinical interview and confirmed by psychometric evaluation (ADHD-t), **2**. Aged from 6-12 years (Primary years), **3**. Live in Cairo, **4**. Live with their mothers at the same home, and **5**. No chronic physical illness.

For the mothers: 1. Mothers' willingness to participate in the study with their children, Aged from 25-45 years, live in Cairo with her children at same home with no chronic illness.

Exclusion criteria: Any criteria are not in the inclusions and Patients refuse to agree the written consent of our study.

Consent and ethical consideration: An approval from Research Ethics Committee in Benha Faculty of Medicine was obtained and an official Permission was obtained to perform the current study and an approval from friends' forever center. An informed written consent was obtained from the patient before participation; it included data about aim of the work, study design, site, time, subject, tool and confidentiality. A developmentally appropriate explanation about the study was also given to the children. The participants understood that they have the right to withdraw from the study at any time without any consequences or will that affect their treatment in the facility.

Methods: All children who were brought to the outpatient clinic with chief complaints of inattention and hyperactivity were evaluated clinically and with ADHD-T (Attention Deficit Hyperactivity Disorder test) to confirm the diagnosis and their mothers were interviewed for basic psychiatric disorders by the researcher with the semi Structural Clinical Interview for DSM IV- Axis 1 disorders and Hamilton Anxiety rating scale HAM-A. Finally they completed State –Trait Anxiety Inventory (STAI).

Instruments

1. **Identification cards for the mother and her child:** Demographic data including age of the children and their mothers, educational level, residence, health status and others were gathered using an identification questionnaire.
2. **Structured Clinical Interview for the DSM-IV Axis I Disorders (SCID-1):** All participating mothers had been subjected to the Structured Clinical Interview for DSM-IV Axis I Disorders Arabic Version. It is a semi-structured interview guide for making DSM-4 diagnoses. It is administered by a clinician or trained mental health professional that is familiar with the DSM-4 classification and diagnostic criteria.[10]
3. **Hamilton Anxiety rating scale (HAM-A) is applied to the mothers:** The Arabic version was used to assess maternal anxiety by psychiatrist (the researcher). The HAM-A was one of the first rating scales developed to measure the severity of anxiety symptoms including anxious mood, tension, fears, insomnia, somatic complaints and behavior at the interview.[11]
4. **State –Trait Anxiety Inventory (STAI) is applied to the mothers:** The Arabic version was administered to all mothers. It is a self-report

measuring the presence and severity of current symptoms of anxiety and a generalized propensity to be anxious. Versions of this measure are available for both adults and children and the adult's version was used. There are 2 subscales within this measure. First, the State Anxiety Scale (S-Anxiety) evaluates the current state of anxiety, asking how respondents feel "right now," using items that measure subjective feelings of apprehension, tension, nervousness, worry, and activation/ arousal of the autonomic nervous system. The Trait Anxiety Scale (T-Anxiety) evaluates relatively stable aspects of "anxiety proneness," including general states of calmness, confidence, and security.[12]

5. **The Attention-Deficit/Hyperactivity Disorder Test (ADHDT)**
   It was applied on the children by the mothers. It is considered an effective instrument for identifying and evaluating attention-deficit disorders in persons ages 3 to 22 and was applied on the children. Based on the diagnostic criteria for Attention-Deficit/Hyperactivity Disorder of the DSM-IV.[13]

Statistical Analysis

The collected data was revised, coded, tabulated and introduced to a PC using Statistical Package for Social Sciences (SPSS) software version 21. data was presented and suitable analysis was done according to the type of data obtained for each parameter.

Descriptive statistics

Means, standard deviation (+- SD) and range for parametric numerical data, Frequency and percentage of non-numerical data.

Analytical statistics

T test was used to assess the statistical significance of the difference between two study group means. Chi-square test was used to examine the relationship between the qualitative variables. Fisher`s exact test: was used to examine the relationship between two qualitative variable when the expected count is less than 5 in more than 20% of cells.

RESULTS

The mean age of the mothers was 35.367 years as shown on table 1. And the mean age of the children was 8.450 years as shown in table 2. Table 1 and 2 demonstrate the demographic variables of the mothers and children variables respectively.

Table 1: Show the socio demographic data of the mothers.

Variables	**Total number = 60 (100%)**		
Age (yrs.)	**Mean +_ SD 35.367 (4.0420) Minimum 28, Maximum 45**		
	Variable	**Frequency**	**Valid percentage**
Current job	House wife	23	38.4%
	Working	37	61.6%
Educational level	University Graduated	45	75.0%
	Post Graduated	15	25.0%
Family History of Psychiatric disorders	Yes	24	40%
	No	36	60%

Table 2: Shows the sociodemographic data of the children.

Variables	**Total number = 60 (100%)**		
Age (yrs.)	**Mean +_ SD 8.450 (2.1583) Minimum 6.0, Maximum 12.0**		
	variable	**Frequency**	**Valid percentage**
Gender: (Gender: frequency)	Male	43	71.7 %
	Female	17	28.3 %
Grade no.: frequency	Grade1:	13	21.67%
	Grade 2:	18	30.0%
	Grade 3	2	3.33%
	Grade 4	6	10.0%
	Grade 5	4	6.67%
	Grade 6	11	18.33%
	Grade 7	6	10.0%
Birth order Rank frequency)	1st	17	28.34%
	2nd	16	26.67%
	3rd	8	13.33%
	4th	4	6.66%
	Only child	15	25.0%

The results of anxiety state show that 30% was above moderate anxiety, 18.33% are moderate and 51.67% are with severe anxiety. Table 3 shows also the results of anxiety trait as the following 1.7% are moderate, 16.7% are above moderate, 43.3% are severe and 38.3% are very severe anxiety. On the other hand the Hamilton scale illustrates the following results 20% are moderate to severe anxiety.

Table 3: Shows the results of Anxiety state, trait and Hamilton Rating Scale for anxiety.

Variables		Total number = 60 (100%)		
		Variable	Frequency	Valid percentage
Anxiety state severity		Above moderate	18	30%
Mean	35.367			
Median	35.000	Moderate	11	18.33%
Standard deviation	4.0420	Severe	31	51.67%
Minimum	28.00			
Maximum	45.00			
Anxiety trait severity		Moderate	1	1.7%
Mean	61.13	Above moderate	10	16.7%
Median	62.00			
Standard deviation	13.549	Severe	26	43.3%
Minimum	31			
Maximum	83	Very severe	23	38.3%
Hamilton severity		Mild	30	50%
Mean	18.15	Mild to moderate	13	21.67%
Median	16.50			
Standard deviation	9.404	Moderate to severe	12	20%
Minimum	6	Severe	5	8.33%
Maximum	45			

In our study, 25% of the mothers are diagnosed with Mood disorders, 21.67% are diagnosed with anxiety disorders and 48.33% are free.

Table 4: Shows Prevalence of different psychiatric disorders in mothers.

Prevalence of different psychiatric disorders in mothers		
Variables	**Frequency**	**Valid Percent**
Mood disorders	15	25%
Anxiety Disorders	13	21.67%
More than diagnosis	3	5%
Nothing	29	48.33%

There was a statistical significant correlation between the anxiety state and the subtype of ADHD, as shown on table 5.

Variable		ADHD presentations			Total	Point Probability
		combined presentation	hyperactive impulsive presentation	inattentive presentation		
Anxiety State severity	moderate	1	0	0	1	.024
	above moderate	7	3	0	10	
	Severe	21	3	2	26	
	very severe	14	3	6	23	
Total		43	9	8	60	

CONCLUSION

26.6% of mothers are diagnosed with mood disorders, and 23.3% are diagnosed with anxiety disorders and that is similar to Ghanizadeh, (2007)[14] who revealed that mood disorder is the most common psychiatric disorder in the parents of children with ADHD. Rate of depression in mothers of ADHD children was 30% in the study published by Soltanifar (2009).[15] In our study 68.3% of the mothers felt anxious at least once in their life, this may be due to stressors facing females starting from monthly hormonal changes till menopause, marital and community issues e.g. gender discrimination, physical, sexual harassments, working and caring with family. In agreement with the current results an observational study aimed to investigate stress and associations to symptoms of exhaustion, depression and anxiety in a working age population seeking primary care found that 59% felt stress before; the female population was about 68.69%.[16]

51.67% are suffering from severe anxiety state features. These results could be explained by the fact that mothers of ADHD children tend to exhibit more controlling and less rewarding parenting[6] and Mirzaaghasi, 2014[17] also found that mothers of (preschool) ADHD children considered their parental efficacy to be less than desirable; this feeling increased the rate of anxiety and depression among them. Lau (2006) agrees with the current research in that the anxiety state is affected by the environmental factors.[18] The anxiety trait mean is 61.13 that indicate severe anxiety and that may suggest that anxious symptomatology might be independent of impairment associated with ADHD symptoms.[9]

There is statistically significant correlation between the state of anxiety and clinical type of ADHD. There is no clear research aimed to clarify the type of the ADHD in relation to the severity of anxiety but some articles tried to explain the different response of mothers that having specific type of ADHD. Mothers of hyperactive children tend to experience more stress, social isolation, self-blame and depression. Mothers of children with ADHD combined and inattentive subtypes tend to feel less satisfied in their role as parents and often experience more negativity in their social lives. They tend to feel less competent in their parenting abilities.[19] This may explain our results that approved that combined, inattentive subtypes causing more anxiety features than hyperactive subtype, it may be due to direct negative effect of inattention on the academic performance of the children and the social skills.

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