Zahedan Journal of Research in Medical Sciences

Vol.12, No.1, Spring 2010 Quarterly

Review Article

Original Article

Short Communication

Case Report

Letter to Editor

Original Article

Zahedan Journal of Research in Medical Sciences

Journal homepage: www.zjrms.ir

The Relationship between Childhood Attention Deficit/Hyperactivity Disorder and Adulthood Borderline Personality Disorder

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Article information

Article history:
Received: 2 May 2011
Accepted: 22 June 2011
Available online: 28 Oct 2012
ZJRMS 2013; 15(2):68 -73

Keywords:
Attention deficit/hyperactivity disorder(ADHD)
Borderline personality disorder(BPD)
Depression

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Abstract

***Background*:** Attention Deficit Hyperactivity Disorder (ADHD) is a risk factor for Borderline Personality Disorder (BPD) during adulthood. Studying the relationship between childhood ADHD disorder symptoms and depression and borderline personality disorder symptoms among students was the main aim of this study.

***Materials and Methods*:** A total of 291 students, who were studying in Shiraz and Tabriz universities inThe academic year of 2010-2011, were selected from three groups of Humanities, Basic Sciences, and Technical-Engineering Sciences using simple sampling method. They participated in the study through completing Wender Utah Rating Scale (WURS), Borderline Personality Scale (STB) and Beck Depression Inventory (BDI-II). Pearsons correlation coefficient and multiple regression analysis were used to analyze the data.

***Results*:** The results showed that there is a significant positive relationship between childhood ADHD and borderline Personality Disorder (BPD) in adulthood and childhood ADHD is able to predict BPD in adulthood (p<0.01). Similarly, the relationship between symptoms of childhood ADHD and depression was positive and significant (p<0.01).

***Conclusion*:** There is a relationship between symptoms of childhood ADHD, BPD and depression in students. It is recommended to pay due attention to the comorbidity disorders such as BPD and depression in the treatment of ADHD disorder.

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopment disorder in childhood and adolescence which is characterized by a consistent pattern of attention deficit, impulsive behavior and hyperactivity and is often continued up to adulthood [1, 2]. Based on a study made by Fossati et al, 60 percent of the patients with a diagnosis of BPD have had ADHD symptoms during their childhood [3]. There is the evidence that shows ADHD during childhood plays a key role in the development of other disorders such as personality disorders in future. ADHD has a direct relationship with the emotional abuse in childhood and more severe symptoms of BPD in adulthood. Moreover, ADULT ADHD has a relationship with the higher risks of comorbidity disorders in the I and II axes of DSM IV-TR [4].

Likewise, Matthias et al. showed that children with severe ADHD are more vulnerable to the personality disorders [5]. Presence of co-morbid hyperactivity in patients with BPD is defined as a Subdivision of impulsivity of borderline personality disorder. The patients who have both disorders show more homogenous and greater impulsivity profile while BPD patients with no co-morbidity of BPD with hyperactivity disorder have more anxiety and depression disorders [6]. Wender and several other studies have examined the co-morbidity between ADHD disorder and BPD [7-13].

Davis and Gastpar showed that there are common characteristics such as deficient in emotional regulation, behavior control, drug abuse, low self-esteem, and problems in interpersonal relationships between BPD and ADHD [9]. Philipsen et al. demonstrated that adults with ADHD gained higher scores than the healthy individuals in seven symptoms of BPD such as self-perception, emotion regulation, self-destructive, boredom, loneliness, intrusions, and hostility, while they gained lower score in the mentioned symptoms in comparison to the individuals with BPD.self-destructive and emotion regulation were regarded as the biggest difference between the patients with ADHD and patients with BPD [11].

Generally, there are convincing evidences that show Attention Deficit Hyperactivity Disorder (ADHD) is manifested as a comorbid disorder with several psychological disorders. More than 80% of these individuals have at least a co-morbid disorder; over 50% of these individuals have two co-morbid disorders and also more than one third of these patients have at least three co-morbid disorders [14]. Many studies have referred to the co-morbidity and/or relationship between ADHD and depression [15-26].

The present study discusses the relationship between ADHD symptoms during childhood and BPD in adulthood. With due attention to the co-morbidity of depression with ADHD, its relationship with depression among students was the other objective of this study.

Materials and Methods

This correlation-descriptive study was conducted on all female and male students of Shiraz and Tabriz universities who were studying in 2010-2011 Academic Year. A sample size as many as 291 students (101 students from Shiraz University and 190 students from Tabriz University) of humanities (101 students), engineering (96 students) and basic sciences (94 students) were selected randomly via simple sampling method. 119 male students and 172 female students constituted our subjects. In order to observe the ethical principles of research, the research questionnaires were submitted to the subjects of the study after assuring their volunteer attendance.

All participants in the study filled out Borderline Personality Scale, ADHD scale (Wender Utah Rating Scale) and Beck Depression Questionnaire. All three questionnaires were found in self-reporting form and without mentioning name and family name. At first, the researcher introduced himself to the subjects and stated main objective of the study to them. Then, students, willing to participate in the study, filled out the mentioned three questionnaires after necessary explanations and put them confidentially in the box containing filled-out questionnaires. Thus, effort was taken to minimize biases.

ADHD Scale, Wender Utah Rating Scale (WURS): Ward et al. made a scale for ADHD by which symptoms of the disorder can be examined retrospectively in adults. This test includes 61 questions and is considered as retrospective self-report with regard to the symptoms of the disorder in childhood.

The scoring method to its questions is done in Likert spectrum form. It is necessary to say that the score "never" equals to zero, "less" equals to one, "average" equals to two, "rather high" equals to three and "very high" equals to four. Ward et al. reported Split-half reliability of the test as 0.90. Moreover, the researchers showed that the scores of this test differentiate significantly ADHD group, depressed and normal individuals from each other. Thus, the mean score of ADHD, normal and depressed individuals stood at 62.2, 16.1 and 31.7, respectively [27]. Sarrami Foroushani examined standardization, reliability and validity of this test in Iran.

In his study, test reliability coefficient was calculated 0.95 and the mean of the test score was calculated 62.25 and 8 in patient and healthy individuals, respectively. The test has construct validity. Moreover, it can be said that the scores less than 42 are statistically natural while the scores more than 42 and less than 56 are dubious and the scores more than 56 indicate existence of ADHD disorder during childhood [28].

Borderline Personality Scale: Schizotypal Trait Questionnaire – B form: STB: Borderline Personality Scale is a part of Schizotypal Trait Questionnaire (STQ). STQ includes two scales: Schizotypal Personality Scale (STA) and Schizotypal Trait Questionnaire B (STB).

This questionnaire was developed by Claridge and Brocks [29] in Oxford University and was revised by Rawlings et al [30]. Mohammadzadeh et al. [31] added six other items to the 18 initial items of STB using modified version of this test in 2001 and adapting it with DSM-IV-TR criteria in order to cover diagnostic criteria for the disorder. So, the scale includes 24 items which is answered in Yes/No form. The questions which are answered with "yes" are given "one" score while the questions answered with "no" will take zero score. This scale measures three factors: hopelessness factor, impulsivity factor, and stress related dissociative and paranoid symptoms.

In Iran, Mohammadzadeh et al. have reported Test-retest reliability coefficient of total STB 0.84 and subscales of hopelessness, impulsivity and stress related dissociative and paranoid symptoms 0.53, 0.72 and 0.50, respectively. They also have reported alpha coefficient of the total scale 0.77. Moreover, they reported 0.64, 0.58 and 0.57 for the subscales of hopelessness, impulsivity and stress related dissociative and paranoid symptoms, respectively. Likewise, STB has a desirable validity (factor analysis and discriminative in Iran [31].

Beck Depression Inventory Second Edition (BDI-II): This 21 item questionnaire has been developed by Beck, Steer, and Brown and evaluates psychological and physical symptoms of depression in self-reporting form. The questionnaire emphasizes cognitive content of depression and measures seven items of "motivational and emotional symptoms" and seven items of "cognitive symptoms" and seven items of "vegetative symptoms of depression". The subjects should study statemets of each group precisely and should select the statement which is more consistent with his or her current situation.

The scores are from 0 to 3, so that "zero" score indicates lack of symptoms of depression, and "three" indicates severe symptoms of depression. The scores from 0 to 13 indicate lack of depression, while scores from 14 to 19 indicate mild to moderate depression and scores from 20 to 28 indicate moderate to severe depression. In the same direction, scores from 29 to 63 indicate severe depression [32].

This test is a reliable test for the diagnosis and measurement of severity of depression before and after the treatment which is applied in different cases. The internal consistency coefficients and Cronbach's Alpha Coefficient show that this test ha suitable validity and reliability among Iranian population [33] The data obtained in this study was evaluated using descriptive and inferential statistics (Pearson Correlation Coefficient and Simultaneous multiple Regression Analysis and also SPSS-17 software.

Results

In this study, 291 students from Shiraz and Tabriz universities were evaluated. The descriptive data have been shown in table 1. In order to analyze data, pearson correlation coefficient and simultaneous multiple regression analysis were used. The results related to the relationship between ADHD symptoms during childhood and symptoms of BPD and depression are shown in table 1. As it is observed in this table, there is significant positive relationship between ADHD and symptoms of borderline personality disorder in general (p<0.01).

It is meant that with the increased symptoms of ADHD in childhood, BPD symptoms are increased in adulthood. Similarly, there is a significant positive relationship between ADHD symptoms during childhood and components of BPD. The relationship between ADHD, impulsivity, hopelessness, stress-related dissociative and paranoid symptoms stood at 0.38, 0.36 and 0.28, respectively (p<0.01). Likewise, a significant positive relationship is observed between the childhood ADHD symptoms and depression (p<0.01).

The following question was analyzed the fact that whether ADHD history in childhood can predict typology of BPD in adulthood? Simultaneous multiple regression analysis wade used in order to study this question. The relevant results are shown in table 3. The results showed that ADHD in childhood is able to predict components of Borderline Personality disorder. In fact, ADHD disorder was able to predict 14 percent of impulsivity factor variance, 13 percent of hopelessness component variance and also 7 percent of stress related dissociative and paranoid symptoms. As it is shown in table 2, ADHD standard regression coefficient is significant and noticeable in the prediction of impulsivity component (p<0.01). Also, ADHD standard regression coefficient is significant and noticeable in the prediction of hopelessness component (p<0.01) and component of stress related dissociative and paranoid symptoms (p<0.01 and t= 4.96).

Table 1. Descriptive data related to subjects

Variable		Frequency (%)
Gender	Male	119(40.9)
	Female	172(59.1)
Educational status	College degree	29(10)
	Bachelor	172(59.1)
	Master of science	90 (30.9)
Field of study	Human sciences	101 (34.7)
	Technical-Engineering	96(33)
	Basic sciences	94 (33.3)
Marital status	Single	17(5.8)
	Married	266(91.4)
University	Shiraz University	101 (34.7)
	Tabriz University	190 (65.3)
Symptoms	Normal	76(26.1)
	Dubious	65(22.3)
	Childhood ADHD	150 (51.5)

Table 2. Correlation coefficient between ADHD, symptoms of borderline personality disorder and depression in the students

Correlation	ADHD symptoms
BPD (general)	%47**
Impulsivity component	%38**
Hopelessness component	%36**
Stress related dissociative component	%28**
Depression	%32**

**p<0.01

Table 3. The regression coefficients between ADHD symptoms, BPD components

Predictor variables	B	S.E	β	t	R^2
Impulsivity component	0.03	0.006	0.38	6.95	0.14**
Hopelessness component	0.03	0.005	0.36	6.62	0.13**
Stress related dissociative component	0.01	0.004	0.28	4.96	0.07**

B=Effect coefficient of predictor variables, SE=Standard error of regression coefficient, β= standard regression coefficient of predictor variables, R^2=Multivariate determinant coefficient = **p<0.01, R2

Discussion

The results showed that there is a positive relationship between ADHD in childhood and the symptoms of BPD and its components. Many researchers have referred to the co-morbidity and/or relationship between these two disorders, in which, the present study is consistent with them [3, 5, 8- 13]. Unlike the previous studies, the present one is mainly focused on the patients non-clinical student population which differ from other studies. For example, Philipsen [4] studied women suffering from BPD and other studies have either been analyzed the patients suffering from ADHD or BPD. In line with the previous studies, it can be said that there is a relationship between the two disorders.

In studying the subscales of symptoms of BPD, it is observed that there is a significant positive relationship between childhood ADHD symptoms and three factors of hopelessness, impulsivity and stress-related dissociative and paranoid symptoms. Impulsivity factor has the highest correlation with the disorder and it can be anticipated, because, impulsivity is the main specification of both disorders. Wender stated that impulsivity, rage explosions, emotional instability are common characteristics of these two disorders [7]. Philipsen [8], Miller et al. [12] have also shown co-morbidity between ADHD with internalizing and externalizing problems. As Ferrer et al. stated existence of comorbidity ADHD in patients suffering from Borderline Personality Disorder is defined as a subdivision of impulsivity of Borderline Personality Disorder. The patients who have both disorders show impulsivity profile [6]. The impulsivity factor of Borderline Personality Scale includes tendency to severe impulses destructive and antisocial impulses towards others and their properties [31].

Also, Philipsen et al. showed that ADHD adults acquired higher scores than the healthy people in their perception, emotional regulating, self-destructive, dysphoria, loneliness, aggression and hostility [11].

This issue can be consistent with the present study, because, hopelessness component includes hopelessness feelings, causeless and destructive feelings towards themselves, details of which can be observed among people suffering from borderline personality disorder. Similarly, the results showed that ADHD in childhood is able to predict all three factors of borderline personality disorder symptoms. This issue is not far-fetched, because, as it was stated by Fossati et al. [3], ADHD in childhood, which is a risk factor for borderline personality disorder, higher percent of the people who suffer from this disorder are affiliated with the said disorder in their adulthood. ADHD in childhood has a key role in creation of other disorders such as personality disorders in the future [4]. Thus, ADHD in childhood can be considered as a risk factor and can treat a person in a subgroup of patients vulnerable to Borderline Personality Disorder.

Therapists should be aware of the existence of ADHD in childhood and adulthood in BPD patients. Moreover, the effects of methylphenidate and psycho pharmacological noradrenalin should be studied strictly among patients with borderline personality disorder and ADHD co-morbidity [4]. In another study, Golubchik et al. showed that treatment of methylphenidate on young and teen women, who are given the diagnosis of borderline personality disorder and ADHD simultaneously, is effective and this medicine is well tolerated in treatment of some common symptoms of these two disorders [34]. Also, Hesslinger et al. presented a structured training program which is used specifically for adult patients with ADHD. This program has been designed based on the principles of Cognitive Behavioral Therapy (CBT) for Borderline Personality Disorder. This program was modified in order to enable compatibility for adults with hyperactivity [35]. The other objective of this study was as follows: to identify this issue that there is a relationship between childhood ADHD and depression. The results showed that there is a significant positive relationship between ADHD and depression. This issue is consistent with the researches that have shown comorbidity and/or positive relationship between two disorders [15- 26]. As Barkley et al. state, more than 80 percent of individuals with ADHD have at least one another co-morbidity disorder, over 50 percent of individuals have two other co-morbidity disorders and also more than one third of these patients have at least three other disorders. Of these comorbidities, it should be referred to the major depressive disorder and dysthymia [14].

The results indicate that depressive disorder is a risk factor for ADHD comorbidity and ADHD and depressive disorder form a distinct familial subtype which can pose risk factors, clinical course and different treatment response. Regarding the relationship between ADHD and symptoms of borderline personality disorder and depression, paying attention to the comorbidity between the disorders and therapeutic factors is necessary. Here under are regarded as limitations of this study: this study has been performed on a student population and its results cannot be generalized to the clinical pupations. Using structured clinical interviews on the patients who have borderline personality disorder, the future researches can study this point that how much these individuals had ADHD symptoms in childhood. Another limitation of this study is as follows: this study is a retrospective study and seems to be more useful in studying relationship between ADHD and borderline personality disorder.

Since childhood ADHD diagnosis questionnaire is retrospective, possibility of recall bias is posed in the obtained results. So, using graded questionnaires of this disorder in adults is suggested for future studies. Given the limited number of the sample, convenience sampling, mentioned problems and limitations in self-reporting of questionnaires, inability to follow up (due to lack of information, for confidentiality). The results of this study cannot be generalized to all adults and consequently, more comprehensive studies are recommended in this respect. Undoubtedly, the present study has been carried out in a specific range and generalizing results to the entire society should be made with caution.

This study shows a partial and relative picture of the positive relationship of ADHD with borderline personality disorder and depression in the community. To complete this picture, other additional researches should be done. In fact, the present study can be considered as a pilot study. Generally, results of this study showed that there is a relationship between ADHD in childhood and symptoms of borderline personality disorder in adulthood and ADHD in childhood is able to predict symptoms of Borderline Personality Disorder in adulthood. Moreover, there is a positive significant relationship between ADHD and depression. In general, the results indicate that ADHD is a common disorder in adults which can bring about many problems for individual but this disorder has not often been diagnosed due to the co-morbidity of this disorder with the other disorders and lack of familiarization of therapists with the features of this disorder in adults. In spite of the fact that treating this disorder is treatable in multidimensional form, patients may be excluded from receiving proper treatment. Given the co-morbidity of ADHD with Borderline Personality Disorder and depression and its prevalence among students, familiarity of therapists in therapy and counseling centers of the universities with the methods of assessment, diagnosis and treatment of ADHD in adults seems necessary and quite sensible.

Acknowledgements

We acknowledge our special gratitude to the students of Shiraz and Tabriz universities who helped us in this study.

Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

Funding/Support

Ferdowsi University of Mashhad, Mashhad.

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Please cite this article as: Mashhadi A, Soltani E, Akbari E, Farmani A. The relationship between childhood attention deficit/hyperactivity disorder and adulthood borderline personality disorder . Zahedan J Res Med Sci (ZJRMS) 2013; 15(2):68 -73.