


Attention deficit and hyperactivity in social anxiety disorder: relationship with trauma history and impulsivity

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Received: 20 June 2015 / Accepted: 12 January 2016 / Published online: 21 January 2016
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Abstract The aim of this study is to investigate the rate of childhood traumatic experiences and assess the relationship between childhood trauma and impulsivity in the presence of attention deficit–hyperactivity disorder (ADHD) in patients with social anxiety disorder (SAD). A total of 123 patients with a primary diagnosis of SAD were enrolled. All patients were assessed by using the clinical version of Structured Clinical Interview for DSM-IV (SCID-I/CV) and Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime version (K-SADS-PL), ADHD module. A clinical and sociodemographic data form and rating scales were filled out. We found higher rates of emotional traumatic experiences and impulsivity along with more severe symptoms of depression, anxiety and social anxiety in the

group of SAD patients with childhood ADHD than in SAD patients without ADHD in childhood. The presence of ADHD is associated with higher severity in several domains in patients with SAD. Patients with SAD should be assessed carefully whether they have ADHD, especially when their SAD symptoms are severe, when they have a history of traumatic experiences or problems with impulse control.

Keywords Social anxiety disorder · Attention deficit–hyperactivity disorder · Childhood trauma · Impulsivity

Introduction

Social anxiety disorder (SAD) is a common disorder in society and emerges early in life. The fact that the onset generally occurs during adolescence (Schneier et al. 1992; Grant et al. 2005) has raised an interest about the relevance of SAD with psychosocial factors such as traumatic childhood experiences. Traumatic childhood experiences (separation from parents, parental divorce, family violence, sexual abuse, childhood disease, etc.) were more frequently found in patients with SAD compared to healthy control groups (Bandelow et al. 2004). In another study, SAD was found to have the most specific association with childhood sexual abuse (CSA) and childhood physical abuse (CPA) among Axis I disorders (David et al. 1995). Moreover, SAD was found to be associated with CSA in females (Cogle et al. 2010; Molnar et al. 2001; Dinwiddie et al. 2000) and CPA in males (Cogle et al. 2010). Gibb et al. (2007) reported that compared to both CSA and CPA, childhood emotional abuse has a stronger association with SAD.

Kuo et al. (2011) compared 102 patients with SAD and 30 healthy controls and found greater childhood emotional

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neglect and abuse in the SAD group. Bruce et al. (2012) assessed 156 patients with SAD by using Childhood Trauma Questionnaire-28 (CTQ-28) and found the following rates for traumatic childhood experiences: 35.9 % physical neglect, 34.6 % physical abuse, 36.5 % emotional neglect, 50.6 % emotional abuse and 68.4 % sexual abuse. Physical neglect, emotional neglect and emotional abuse were associated with higher symptom severity; emotional neglect and emotional abuse were associated with greater disability in that study (Bruce et al. 2012). In another study, at least one childhood abuse or neglect experience was found in 70 % of 103 patients with generalized type SAD. Total CTQ-28 score was found to be associated with higher Liebowitz Social Anxiety Scale (LSAS) and lower Clinical Global Impression (CGI) scores (Simon et al. 2009).

The relationship between SAD and ADHD

The relationship between inattentive type of ADHD and SAD was pointed out, and it was reported that the presence of comorbid ADHD was associated with increased severity of SAD symptoms and decreased functionality (Koyuncu et al. 2015). In two studies conducted with small samples, 3 % of 33 SAD patients were diagnosed with childhood ADHD (Safren et al. 2001) and childhood symptoms of ADHD were reported in 7.8 % of patients with SAD (Mörtberg et al. 2012). Adult ADHD studies also revealed an association between these two disorders (Kessler et al. 2006; Park et al. 2011).

The relationship between ADHD and trauma

Similar to children who have disabilities, children with ADHD are also constantly maltreated (Prayez et al. 2011). In an epidemiological study, inattentive type of ADHD was found to be related to neglect, physical neglect, physical abuse and sexual abuse, whereas hyperactive type of ADHD was found to be related to neglect and physical abuse (Ouyang et al. 2008). Sonnby et al. (2011) investigated 4910 students aged between 15 and 18 and found experience of any sexual abuse in 20.9 % of the sample (28.7 % for females and 13.3 % for males).

History of any abuse was found to be higher in girls with ADHD than in controls (14.3 vs. 4.5 %) (Briscoe-Smith and Hinshaw 2006). Rucklidge et al. (2006) reported higher rates of emotional neglect and emotional abuse in males with ADHD and higher emotional neglect, emotional abuse, physical abuse and sexual abuse in females with ADHD compared to controls.

From another aspect, in a study with 95 children with a history of sexual abuse, 13.6 % were diagnosed with

ADHD (Merry and Andrews 1994). In another study ADHD, (22 %) was the most common psychiatric comorbidity among the group of sexually, physically and emotionally abused children (Cengel-Kultur et al. 2007).

Overall, SAD is significantly associated with ADHD, whereas traumatic experiences during childhood are associated with both of these disorders. Therefore, it is important to assess the complex relationships between ADHD and childhood traumas in patients with SAD. Impulsivity is one of the three core features of ADHD, and its possible associations with childhood traumatic experiences in patients with SAD have not been studied extensively yet. Our aim in the present study is to assess the relationship between trauma and impulsivity and the impact of ADHD on this relationship in a sample of patients with SAD.

Materials and methods

A total of 123 patients with a primary diagnosis of generalized type of SAD were included in this study. Patients were chosen from the admissions to a private center for SAD and İncirli Ethica Hospital from September 01, 2013, to October 31, 2014. All patients were assessed by using Structured Clinical Interview for DSM-IV/Clinician version (SCID-I/CV) (First et al. 1997). All patients gave informed consent to participate in the study after the study protocols had been fully explained. This study adheres to the Declaration of Helsinki. All interviews of the study were carried out by the principal investigator (A. K).

Inclusion criteria were being between 18 and 65 years of age, meeting criteria for generalized type SAD and not receiving psychiatric treatment for at least 1 month prior to the study interviews. Patients with schizophrenia or related psychotic disorders or organic mental syndromes were excluded from the study.

Then, to assess childhood ADHD, Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime version (K-SADS-PL), ADHD module (Kaufman et al. 1997) was administered to all patients. The Turkish version of this interview is a valid and reliable instrument (Gökler et al. 2004). The K-SADS-PL is a semi-structured diagnostic interview used to assess current and past psychiatric disorders in children and adolescents conforming to DSM-III-R and DSM-IV criteria (Kaufman et al. 1997). This interview was used for the retrospective evaluation of childhood psychopathologies in previous studies (Biederman et al. 1993; McGough et al. 2005; Tamam et al. 2008; Koyuncu et al. 2015).

In our study, childhood ADHD was diagnosed according to DSM-IV diagnostic criteria (27). A total of 74 patients (60.2 %) met childhood ADHD diagnostic criteria; 55 of

those patients had inattentive type of ADHD; three had hyperactive/impulsive type of ADHD; 16 had combined type of ADHD; and 49 of the patients did not meet criteria for childhood ADHD.

A sociodemographic and clinical questionnaire developed by the investigators were also filled by clinicians. All patients were assessed with LSAS (Liebowitz 1987), Beck Depression Inventory (BDI) (Beck et al. 1961), Hamilton Rating Scale for Depression (HAM-D) (Hamilton 1960), Hamilton Rating Scale for Anxiety (HAM-A) (Hamilton 1959), Childhood Traumatic Experiences Questionnaire-28 (CTQ-28) (Bernstein et al. 2003) and Barratt Impulsiveness Scale-11 (BIS-11) (Patton et al. 1995). Diagnoses were made at the first interview, and the assessments mentioned above were done at the second interview.

Finally, a group of 74 SAD patients with comorbid childhood ADHD (SAD + ADHD group) was compared with the group of 49 SAD patients without comorbid childhood ADHD (SAD without ADHD) in terms of sociodemographic features, comorbidity and rating scale scores. Pearson's correlation was applied to assess the relationship between the total scores of BIS-11 and CTQ-28, and the relationship between the total scores of BIS-11 and LSAS.

Childhood Trauma Questionnaire—brief version (CTQ-28)

CTQ is a 28-item self-report scale consisting of five subscales of trauma: physical neglect, emotional neglect, physical abuse, emotional abuse and sexual abuse (Bernstein et al. 2003). This scale was previously used for evaluation of childhood traumas in other studies (Simon et al. 2009; Bruce et al. 2012). Threshold values of CTQ (Walker threshold) that were used in previous studies were used in order to detect any lifetime experience of neglect or abuse. The following scores identified the threshold for the presence of abuse or neglect: physical abuse ≥ 8 , physical neglect ≥ 8 , sexual abuse ≥ 8 , emotional neglect ≥ 15 , emotional abuse ≥ 10 (Walker et al. 1999; Simon et al. 2009).

Barratt Impulsiveness Scale (BIS-11)

The BIS-11 is a self-report scale used to assess impulsiveness as a trait. The questionnaire consists of 30 items and yields four different subscores. These are attentional impulsiveness, motor impulsiveness, non-planning impulsiveness and total scores. Higher total scores of BIS-11 indicate higher level of impulsiveness. The reliability and the validity of the Turkish version of BIS-11 have been demonstrated by Güleç et al. (2008).

Statistical analysis was performed by using the Statistical Package for Social Sciences (SPSS) version 15.0. The

comparison of the SAD + ADHD group and the SAD without ADHD group was made by using Student's *t* test for independent samples. The Fisher's exact test/ χ^2 test was used to compare categorical variables. The relation between the total scores of BIS-11 and CTQ-28, and BIS-11 and LSAS was computed by using Pearson's correlation. $p < 0.05$ was accepted as significant.

Results

A total of 55 of the patients were female (44.7 %), and 85 patients were never married (69.1 %). The mean age of the patients was 27.83 (min 18, max 44, SD 6.4), and mean age of onset of SAD was 11.89 (min 5, max 26, SD 5.06). Any lifetime trauma (abuse or neglect) was detected in 65 patients (52.8 %) according to the Walker threshold cutoff points for CTQ.

Following rates of childhood trauma in patients with SAD were detected: physical neglect in two patients (1.6 %), emotional neglect in 52 patients (42.3 %), physical abuse in 11 patients (8.9 %), emotional abuse in 46 patients (37.4 %) and sexual abuse in 11 patients (8.9 %). There were 58 patients without any traumatic childhood experiences (47.2 %). Of 65 patients who reported at least one type of trauma, 26 patients (21.1 %) experienced only one type of trauma among five types assessed by CTQ. Two types of traumatic experiences were found in 22 patients (17.9 %), three types were found in 15 patients (12.2 %), and four types were found in two patients (1.6 %). No patient has reported all five types of trauma in CTQ.

In comparison with the groups, the mean age of the SAD + ADHD group was lower than that of SAD without ADHD group ($p = 0.033$). There were no significant differences between SAD + ADHD and SAD without ADHD groups in terms of gender, mean years of education and marital status, age at onset of SAD, age at first admission and mean number of lifetime any additional disorder (Table 1).

The rate of lifetime bipolar disorder comorbidity was higher in SAD + ADHD group than in SAD without ADHD group (17.6–0 %, $\chi^2 = 9.62$, $p = 0.002$). There were no significant differences in terms of other Axis I comorbidity rates.

Also, the mean scores of BIS inattention ($p < 0.001$), BIS motor impulsivity ($p < 0.001$), BIS non-planning ($p < 0.001$) and total scores of BIS-11 ($p < 0.001$) and CTQ emotional neglect (0.014), CTQ emotional abuse ($p < 0.001$), CTQ-28 total scores ($p = 0.002$) in the SAD + ADHD group were significantly higher compared to the SAD without ADHD group. There were no significant differences in terms of CTQ physical neglect, CTQ

Table 1 Comparison of SAD patients with and without ADHD in terms of age and rating scale scores

	SAD + ADHD (<i>n</i> = 74) Mean (SD)	SAD without ADHD (<i>n</i> = 49) Mean (SD)	<i>T</i>	<i>p</i>
Age	26.8 (6.6)	29.3 (5.8)	2.15	0.033
BIS inattention	20.6 (3.1)	15.1 (3.0)	−9.70	0.000
BIS motor	21.6 (4.2)	17.5 (3.0)	−6.27	0.000
BIS non-planning	29.7 (4.6)	22.5 (3.5)	−9.35	0.000
BIS-11 total	71.9 (9.6)	55.3 (7.6)	−10.20	0.000
Physical neglect	3.6 (1.4)	3.3 (0.8)	−1.78	0.078
Emotional neglect	15.8 (5.5)	13.4 (5.1)	−2.48	0.014
Physical abuse	6.1 (2.7)	5.4 (1.7)	−1.77	0.078
Emotional abuse	10.1 (4.5)	7.5 (3.4)	−3.65	0.000
Sexual abuse	5.7 (2.0)	5.5 (2.0)	−0.39	0.693
CTQ-28 total	41.4 (12.2)	35.0 (9.5)	−3.19	0.002
HAM-D	14.9 (5.0)	10.2 (5.7)	−4.58	0.000
HAM-A	10.6 (3.8)	7.4 (3.6)	−4.52	0.000
BDI	20.3 (7.3)	13.0 (7.6)	−5.33	0.000
LSAS fear/anxiety	68.5 (6.2)	62.0 (5.5)	−5.98	0.000
LSAS avoidance	66.2 (7.7)	57.9 (6.6)	−6.22	0.000
LSAS total	134.7 (13.4)	120.0 (11.6)	−6.22	0.000

CTQ Childhood Trauma Questionnaire, HAM-D Hamilton Depression Rating Scale, HAM-A Hamilton Anxiety Rating Scale, BDI Beck Depression Inventory, LSAS Liebowitz Social Anxiety Scale

physical abuse, CTQ sexual abuse scores between groups (Table 1).

The mean HAM-D ($p < 0.001$), HAM-A ($p < 0.001$), BDI ($p < 0.001$), LSAS fear/anxiety ($p < 0.001$), LSAS avoidance ($p < 0.001$) and LSAS total scores ($p < 0.001$) were significantly higher in SAD + ADHD group than in the SAD without ADHD group (Table 1).

Mean total scores for CTQ-28 and BIS-11 were 38.85 (SD 11.6) and 65.31 (SD 12.0), respectively. BIS-11 total scores were significantly positively correlated with the CTQ-28 total scores ($r = 34.9$, $p < 0.001$) and LSAS total scores ($r = 39.5$, $p < 0.001$).

Discussion

We found a high rate of trauma in patients with SAD; over half of our sample reported at least one type of childhood traumatic experience. A study in patients with SAD has detected at least one trauma in 70 % of the patients (Simon et al. 2009). In our study, we found the following rates: physical neglect 1.6 %, emotional neglect 42.3 %, physical abuse 8.9 %, emotional abuse 37.4 % and sexual abuse 8.9 %. Two studies focusing on this subject have found the following rates: physical neglect 35–35.9 %, CPA 30–34.6 %, emotional neglect 36.5–39 %, emotional abuse 50.6–56 % and CSA 17–68.4 % (Simon et al. 2009; Bruce et al. 2012). The rates we found, particularly for physical neglect, CPA and CSA, were

somewhat lower than the rates reported in those two studies. However, emotional neglect and abuse were predominant among the types of trauma in our study. These results were compatible with the conclusions previously made on SAD being more strongly related to emotional abuse (Gibb et al. 2007; Kuo et al. 2011) and the presence of emotional abuse being a significant predictor of the onset of SAD (Acartürk et al. 2008). Children with SAD may be more prone to trauma exposure and/or children with a history of trauma may develop avoidant traits or social anxiety.

We found higher CTQ emotional neglect scores, CTQ emotional abuse scores and total CTQ-28 scores in SAD patients with comorbid childhood ADHD than in SAD patients without ADHD in childhood. This finding was compatible with the studies that reported an association between ADHD and childhood traumatic experiences (Flisher et al. 1997; Ford et al. 2000; Briscoe-Smith and Hinshaw 2006; Rucklidge et al. 2006; Ouyang et al. 2008; Prayez et al. 2011) and also with the studies that reported high rates of ADHD in children with a history of abuse (Famularo et al. 1992; McLeer et al. 1994; Merry and Andrews 1994; Cengel-Kultur et al. 2007). We found high rates of comorbid childhood ADHD in SAD patients in the current study (60.2 %). Also, emotional abuse and emotional neglect scores were significantly higher in patients with SAD who have a history of comorbid childhood ADHD than in patients without childhood ADHD. Rucklidge et al. (2006) reported higher rates of emotional

neglect and emotional abuse in patients with ADHD. Taken together, higher rates of emotional trauma in SAD may be associated with childhood ADHD comorbidity. Prospective studies are needed to better characterize this relationship.

Impulsivity and neglect are a common phenomenon in ADHD, but less well investigated in SAD. Two studies conducted in patients with substance use disorders have found a significant association between impulsivity and childhood abuse and neglect (Roy 2005; Narvaez et al. 2012). In a study with 136 depressed adult patients, Brodsky and colleagues reported that those with a history of abuse showed higher scores of impulsiveness. They suggested that childhood abuse is an environmental risk factor for developing trait impulsiveness (Brodsky et al. 2001). Our study has revealed that a similar relationship between childhood trauma and impulsivity is also existed in patients with SAD. Additionally, SAD patients who have ADHD in childhood were more impulsive than SAD patients without childhood ADHD. This result was considered as an expected finding, since impulsiveness constitutes one of the three core components of ADHD.

We also found higher LSAS, HAM-D, HAM-A, BDI scores in the SAD + ADHD group than in SAD without ADHD group in the present study, similarly to our previous study (Koyuncu et al. 2015). History of childhood ADHD was found to be correlated with severity of depression symptoms in patients with anxiety disorders (Mancini et al. 1999). Our findings are compatible with these consequences. By taking the positive correlation between BIS-11 and LSAS scores into account, we suggest that impulsiveness and the symptom severity of SAD are interrelated.

In conclusion, we found more traumatic experiences and impulsivity along with more severe symptoms of depression, anxiety and social anxiety in the SAD group comorbid with childhood ADHD. These findings suggest that the presence of ADHD may be associated with higher symptom severity and impulsivity in patients with SAD. Higher scores of emotional trauma in SAD patients with childhood ADHD than in SAD patients without childhood ADHD suggest that emotional trauma may constitute a link between ADHD and later development of SAD.

Patients with SAD should be assessed carefully whether they have ADHD, especially when their SAD symptoms are severe, when they have a history of traumatic experiences or problems with impulse control.

Limitations

Our study has some limitations. First of all, anamnestic information was collected during the interview retrospectively. Moreover, there were no follow-up data of the patients. Additionally, in the present study, participants

were admitted to different mental health centers through personal referral or internet search and who have relatively high levels of education.

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