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ORIGINAL PAPER

The impact of trauma and post-traumatic stress disorder on the treatment response of patients with obsessive-compulsive disorder

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Abstract Few case series studies have addressed the issue of treatment response in patients with obsessive-compulsive disorder (OCD) and comorbid post-traumatic stress disorder (PTSD), and there are no prospective studies addressing response to conventional treatment in OCD patients with a history of trauma (HT). The present study aimed to investigate, prospectively, the impact of HT or PTSD on two systematic, first-line treatments for OCD. Two hundred and nineteen non-treatment-resistant OCD outpatients were treated with either group cognitive-behavioral therapy (GCBT $n = 147$) or monotherapy with a selective serotonin reuptake inhibitor (SSRI $n = 72$). Presence of HT and PTSD were assessed at intake, as part of a broader clinical and demographical baseline characterization of the sample. Severity and types of OCD symptoms were assessed with the Yale-Brown Obsessive-Compulsive Scale (YBOCS) and the Dimensional YBOCS (DYBOCS), respectively. Depression and anxiety symptoms were measured with the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI). Both treatments had 12-week duration. Treatment response was considered as a categorical [35% or greater reduction in baseline YBOCS scores plus a Clinical Global Impression-Improvement rating of better (2) or much better (1)] and continuous variable (absolute number reduction in baseline YBOCS scores). Treatment response was compared between the OCD + HT group versus the OCD without HT group and between the OCD + PTSD group versus the OCD without PTSD group. Parametric and non-parametric tests were used when indicated. Data on HT and PTSD were available for 215 subjects. Thirty-eight subjects (17.67% of the whole sample) had a positive HT (OCD + HT group) and 22 subjects (57.89% of the OCD + HT group and 10.23% of the whole sample) met full DSM-IV criteria for PTSD. The OCD + HT and OCD without HT groups presented similar response to GCBT (60% of responders in the first group and 63% of responders in the second group, $p = 1.00$). Regarding SSRI treatment, the difference between the response of the OCD + HT (47.4%) and OCD without HT (22.2%) groups was marginally significant ($p = 0.07$). In addition, the OCD + PTSD group presented a greater treatment response than the OCD without PTSD group when treatment response was considered as a continuous variable ($p = 0.01$). The age when the first trauma occurred had no impact on treatment response. In terms of specific OCD symptom dimensions, as measured by the DYBOCS, OCD treatment fostered greater reductions for the OCD + PTSD group than for the OCD without PTSD group in the scores of contamination obsessions and cleaning compulsions, collecting and hoarding and miscellaneous obsessions and related compulsions (including illness concerns and mental

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rituals, among others). The OCD + PTSD group also presented a greater reduction in anxiety scores than the OCD without PTSD group ($p = 0.003$). The presence of HT or PTSD was not related to a poorer treatment response in this sample of non-treatment-resistant OCD patients. Unexpectedly, OCD patients with PTSD presented a greater magnitude of response when compared with OCD without PTSD patients in specific OCD symptom dimensions. Future studies are needed to clarify if trauma and PTSD have a more significant impact on the onset and clinical expression of OCD than on the conventional treatment for this condition, and whether OCD stemming from trauma would constitute a subtype of OCD with a distinct response to conventional treatment.

Keywords Trauma · Post-traumatic stress disorder · Obsessive-compulsive disorder · Treatment

Introduction

Obsessive-compulsive disorder (OCD) may be considered one of the most chronic and costly mental disorders [23]. With a lifetime prevalence of about 1.6% [22], its main characteristics are recurrent, unwanted thoughts or images, pathological doubt, excessive worry concerning sexual, religious or moral behavior, need of symmetry, and repetitive behaviors such as excessive washing, checking, ordering/arranging, counting, hoarding behaviors, and avoidance, among other less common manifestations [1].

Post-traumatic stress disorder (PTSD) is characterized by persistent re-experiencing, avoidance, and hyperarousal related to a traumatic event that, like OCD, may cause a severe impact on the quality of life [1].

Recent research has addressed possible interactions between OCD and PTSD, including the influence of PTSD comorbidity on treatment response of OCD patients. For example, traumatic experiences in early life have been associated with psychiatric manifestations in adulthood and higher levels of psychopathology [31, 32]. In addition, the development of treatment-resistant OCD with mainly aggressive and contamination symptoms following trauma has been observed in case series studies [8, 12, 26]. The presence of PTSD was associated with a poor response to behavioral therapy in a study by Gershuny et al. [11], where patients could be on concurrent pharmacological therapy. In a more recent study conducted by the same group with a sample of 104 treatment-resistant OCD patients [13], about 40% of the overall sample met criteria for PTSD, and PTSD prevalence was highest in individuals who had an additional comorbid diagnosis of borderline personality disorder or major depressive disorder. However, the study design did not allow for the assessment of the predictive role of those two disorders in OCD treatment outcome independently of the PTSD comorbidity.

From the OCD perspective, understanding the variability in treatment response remains a challenge for researchers and clinicians. Comorbid psychiatric disorders, such as major depression and personality disorders, have been considered as factors associated with a limited response to conventional treatments [21]. However, little is known about the influence of history of trauma (HT) on treatment response of OCD, and very little evidence exists on the impact of PTSD comorbidity on OCD treatment [11, 13, 28].

In summary, most of the existing studies have focused primarily on the impact of trauma and PTSD on the severity of OCD symptoms [6, 7], whereas little attention has been paid to trauma and PTSD as factors possibly involved in the prognosis and treatment response of OCD. Since there are no studies addressing response to first-line treatment in OCD patients with HT, and there are only a few studies of treatment response in patients with OCD and comorbid PTSD [11, 13, 28], the prospective investigation of response to systematic treatment of non-treatment-resistant OCD patients with HT or PTSD might provide useful information concerning the impact of these conditions on OCD treatment.

The main objective of the present study was to assess the impact of HT and PTSD on the response to standardized, conventional treatments for OCD [group cognitive-behavioral therapy (GCBT) and selective serotonin reuptake inhibitors (SSRIs)]. Additionally, exploratory analyses were performed to investigate the relationship between specific OCD symptom dimensions and prognosis. Our main hypotheses were as follows: (1) presence of HT or PTSD would have a negative impact on OCD treatment; (2) the earlier the age of the first traumatic experience, the worse the response.

Methods

Sample

The sample comprised consecutive adult patients with a primary DSM-IV diagnosis of OCD, who were willing to receive treatment for their condition, recruited from two outpatient Brazilian sites: São Paulo (SP) and Rio Grande do Sul (RGS). Referral sources were the regional branches of the Brazilian Association of Tourette Syndrome and Obsessive-Compulsive Disorder (ASTOC), television, radio and newspaper ads, and mental health clinics. The inclusion criteria were as follows: (1) a DSM-IV diagnosis of OCD; (2) a baseline Yale-Brown Obsessive-Compulsive Scale (YBOCS)[14] score of at least 16 for obsessions and

compulsions or 10 for only obsessions or compulsions, and (3) absence of prior adequate treatment for OCD (20 h of CBT or a 12-week trial of an SSRI at recommended doses). Patients with brain disease, current psychoactive substance abuse or dependence, current psychotic symptoms, suicide risk, or current clinical or psychiatric conditions for which the use of SSRIs is contraindicated, were excluded from the study. The study protocol was approved by the Ethics Research Committee of the two institutions and written informed consent was obtained from all subjects after a detailed explanation of the procedures included in the research protocol at each site.

Assessments

For medical and psychiatric history, a semi-structured interview, developed by the research team that constitutes the Brazilian OCD Consortium (C-TOC) [25], was used. Psychiatric diagnoses and HT were assessed with the Structured Clinical Interview for DSM-IV (SCID-IV) [9]. HT was assessed with the following questions from the PTSD section of the SCID: (F105)—the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others; and (F106)—the person's response involved intense fear, helplessness or horror. Subjects who provided positive answers to both questions, along with those who met full criteria for PTSD, constituted the OCD + HT group. Additional information on trauma was obtained with the Trauma History Questionnaire [16]. This instrument assesses the types of trauma (crime, disaster, physical and sexual experiences, and others), the number of times that each type of trauma occurred and the age at the occurrence of each traumatic experience. The presence and severity of obsessive-compulsive symptoms was assessed with the YBOCS [14], which has 10 questions on a 0–4 point scale, evaluating the amount of time consumed by the symptoms, the level of distress and interference of the symptoms, and the ability to resist and suppress the symptoms. Specific types of symptoms were assessed with the Dimensional YBOCS Interview (DYBOCS) [27]. This interview assesses lifetime, current severity, and age at onset of six distinct OCD symptom dimensions: (1) aggressive, violent and natural disaster obsessions and related compulsions, (2) sexual and religious obsessions and compulsions, (3) symmetry, ordering/arranging and counting obsessions and compulsions, (4) contamination obsessions and cleaning compulsions, (5) hoarding obsessions and compulsions, (6) miscellaneous (26 items, including illness concerns, mental rituals, and superstitious symptoms). For each dimension, there are three questions with a 0–5 point scale to measure time consumed by the symptoms, distress, and interference (maximum score in each dimension = 15). The severity of depression and anxiety symptoms was assessed with the Beck Depression Inventory (BDI) [2] and the Beck Anxiety Inventory (BAI) [3], respectively. Interviews were conducted by postgraduate psychiatrists and master's-level psychologists, experienced in treating OCD patients.

Treatments

At the SP site, participants entered a practical clinical trial designed to compare GCBT and SSRIs for the treatment of OCD. They were sequentially allocated to one of these treatments, according to a minimization procedure, which increases the chance of balance between prognostic factors in the two treatment groups [10]. At the RGS site, patients were offered only GCBT. Both treatments had 12-week duration. Among the GCBT group, 42 patients from the RGS site and 19 patients from the SP site were taking medication for OCD before study initiation. According to the inclusion criteria, they were taking lower doses than the maximum recommended for OCD, and had been on a stable regimen for at least 3 months prior to entering GCBT.

For the SSRI group, fluoxetine was given in an open procedure, in doses up to 80 mg/day (starting at 20 mg/day in the first week, with weekly increments of 20 mg/day). Patients were seen by a psychiatrist at weeks 0, 2, 4, 8, and 12. Another SSRI could be used, up to the higher tolerated or recommended dose, if patients did not tolerate fluoxetine. This was the case for six subjects: four received sertraline, one paroxetine, and one citalopram at the maximum recommended or tolerated doses (200 mg/day for sertraline, 60 mg/day for paroxetine, or 50 mg/day for citalopram).

Patients who received GCBT were allocated to groups of 6–8 patients, and received weekly, 2-h sessions. Three additional follow-up sessions were offered. GCBT sessions were conducted in a standardized manner at both sites, following a manual developed by one of the authors (A. V. C), who was in charge of the formal training of the researchers who conducted the sessions. All therapists were doctoral-level psychologists with prior GCBT experience. The techniques included psychoeducation, exposure/response prevention exercises, cognitive approaches, two family sessions and strategies for maintaining goals and relapse prevention. A detailed description of the treatment protocol can be found at Cordioli et al. [5].

Treatment response

At SP site, the rater of treatment response was blind to the type of treatment received. At the RGS site, an independent rater that knew the treatment protocol but did not

participate in the group sessions assessed response to GCBT. Response was considered as a continuous (absolute number of points reduction in baseline YBOCS scores) and categorical variable [35% or greater decrease in baseline YBOCS scores plus a Clinical Global Impression Scale-Improvement score (CGI) [18] of 1 (much better) or 2 (better)]. The categorical criterion has been extensively adopted in the field and is considered conservative in respect to treatment response [30].

Statistical analysis

The primary outcome measure was treatment response after 12 weeks of OCD treatment. Treatment response was analyzed in relation to the presence of HT or PTSD. Comparisons were performed in the OCD + HT versus OCD without HT groups, and OCD + PTSD versus OCD without PTSD groups in relation to sociodemographic and clinical variables, including specific OCD symptom dimensions. In order to evaluate the association between presence of HT or PTSD and the categorical variables, the χ^2 test with Yates' correction for continuity was employed. The comparisons of continuous variables between the OCD + HT versus OCD without HT and the OCD + PTSD versus the OCD without PTSD groups were performed by means of the Mann–Whitney test and the non-parametric test for ordinal variables with repetitive measures [4]. The significance level was set at 0.05. The software used for the statistical analyses was the SPSS v.14.0 for Windows.

Results

The sample consisted of 219 subjects. Seventy-two subjects completed an SSRI trial and 147 completed GCBT. Data on HT and PTSD were available for 215 patients. The mean ± SD age of the sample was 36.3 ± 11.8 years. One hundred and thirty-five participants were female (62.8%). The number of years of education was 13.9 ± 4.2 (mean ± SD) and 94 participants (43.7%) were married. One hundred and seventy-five participants (81.4%) were diagnosed with at least one additional lifetime DSM-IV axis I disorder.

Thirty-eight subjects (17.67% of the whole sample) had a positive HT (OCD + HT group). Twenty-two subjects (57.89% of the OCD + HT group and 10.23% of the whole sample) met full DSM-IV criteria for PTSD (OCD + PTSD group). The OCD + HT group experienced an average of 2.4 ± 0.9 types of traumatic events. The specific types of trauma reported by the OCD + HT group were: disaster (88%), crime (76%), physical and sexual assault (41%), and other traumatic experiences (26%). OCD symptoms started before PTSD in 13 subjects, after PTSD in seven subjects, and concurrent with PTSD in two subjects. The three groups had similar outcomes, as shown by non-parametric analysis for ordered repeated measures (p value = 0.16).

Baseline obsessive-compulsive symptom severity is described in Table 1. YBOCS scores were similar in all groups, whereas DYBOCS scores were similar for OCD + HT and OCD without HT groups, but tended to be higher in the OCD + PTSD than in the OCD without PTSD group (p value = 0.046).

Gender distribution was similar in the OCD without PTSD and OCD + PTSD groups (respectively, 61.5 and 72.7% of females, $p = 0.301$), as well as the age at the moment of admission in the study [respective means (S.E.) were 36.1 (0.85) and 38 (2.55), $p = 0.469$].

A comparison of patients according to their site of origin indicated a higher frequency of OCD + HT in the SP site (13.9% in SP vs. 1.1% in RGS, $p = 0.001$) and no significant differences in terms of OCD + PTSD frequency (10.7% in SP and 9.8% in RGS, $p = 0.835$). Baseline YBOCS scores were higher in the RGS site [respective RGS and SP means (S.E.) were 31.22 (0.46) and 26.45 (0.52), $p < 0.001$]. The RGS site had also a greater proportion of female patients (52% of females in SP vs. 76.1% in RGS, $p < 0.001$).

Treatment response in the OCD ± HT versus OCD without HT groups

Data on treatment response was available for 198 patients, 34 in the HT group, and 164 in the non-HT group (134 subjects completed GCBT and 64 completed the SSRI trial). There was no difference in the rate of response to GCBT between the HT (60% of responders) and non-HT group (63% of responders, $p = 1.000$) for response as a categorical variable (35% or greater decrease in baseline YBOCS scores + CGI score 1 or 2). Regarding SSRI treatment, there were 47.4% of responders in the HT group versus 22.2% in the non-HT group, a marginally significant difference ($p = 0.07$). There were no differences between groups for response as a continuous variable, either considering GCBT and SSRI separately or together.

Treatment response in the OCD ± PTSD versus OCD without PTSD groups

Among the 142 patients who completed GCBT and 71 who completed the SSRI trial, data on categorical response criteria were available for 194 patients, 21 in the OCD + PTSD group and 173 in the OCD without PTSD group. The rate of responders to GCBT was 80% for the OCD + PTSD group and 61.3% for the OCD without

Table 1 Baseline obsessive-compulsive symptom severity [mean (SE)] among OCD patients with and without trauma

Instrument	GROUP		p value*	GROUP		p value*
	OCD + HT	OCD w/HT		OCD + PTSD	OCD w/PTSD	
YBOCS	27.9 (5.1)	28.7 (5.8)	0.230	28.7 (6.6)	28.5 (5.6)	0.650
D-YBOCS	23.2 (4.2)	22.9 (4.1)	0.530	24.1 (4.3)	22.8 (4.1)	0.046

OCD obsessive-compulsive disorder, *HT* history of trauma, *PTSD* post-traumatic stress disorder, *YBOCS* Yale-Brown Obsessive-Compulsive Scale, *D-YBOCS* Dimensional Yale-Brown Obsessive-Compulsive Scale

* Mann–Whitney test, level of significance = 0.05

PTSD group ($p = 0.32$). The rate of responders to SSRIs was 40% for the OCD + PTSD group and 27.8% for the OCD without PTSD group ($p = 0.47$). There were no differences in the mean percent reduction in baseline YBOCS scores between groups, either considering GCBT and SSRI together or having each treatment analyzed separately. In contrast, for the criteria of response as a continuous variable, the OCD + PTSD group presented greater decrease in baseline YBOCS scores than the OCD without PTSD group ($p = 0.0132$). Table 2 shows data on treatment response considering response as the reduction in baseline YBOCS scores in absolute numbers.

Analysis of the age of occurrence of the first traumatic event in relation to treatment response

There was no association between the age of occurrence of the first traumatic event (mean ± SD = 15.6 ± 0.77 years) and response to OCD treatment, either considering GCBT and SSRI together or having each treatment analyzed separately.

Impact of OCD treatment on specific symptom dimensions in the OCD without PTSD versus OCD ± PTSD groups

When treatment response for the six symptom dimensions measured by the DYBOCS [25] was analyzed, there was a significant greater reduction in the scores of the OCD + PTSD than in the OCD without PTSD group concerning contamination obsessions and cleaning compulsions ($p = 0.026$); collecting and hoarding ($p = 0.029$), and miscellaneous obsessions and related compulsions, including illness concerns, mental rituals and superstitious symptoms, among others ($p = 0.014$) (Fig. 1).

Variation of depression and anxiety measures between baseline and post-treatment

Table 3 shows the variation in the BDI and BAI scores in the OCD + PTSD and OCD without PTSD groups. There was a significant greater reduction in anxiety, but not in depression scores, in the OCD + PTSD group ($p = 0.003$). No correlation was observed between the variation in YBOCS and BDI or BAI scores (Pearson correlation coefficients = 0.209 and 0.343, respectively).

Discussion

This study aimed to investigate the impact of traumatic events and PTSD on the short-term response to first-line treatments for OCD. An exploratory analysis of the impact of PTSD on the treatment response of specific OCD symptoms was also performed. For this purpose, a detailed assessment of OCD symptomatology was conducted with the DYBOCS [27], a recently developed interview, which generates specific scores for each symptom dimension. Our

Table 2 Variation [mean (S.E.)] in YBOCS scores for the OCD without PTSD and the OCD + PTSD groups from baseline to post-treatment

Treatment	Group						p value*
	OCD without PTSD ($n = 184$)			OCD + PTSD ($n = 21$)			
	Baseline	12th week	Difference	Baseline	12th week	Difference	
GCBT	29.57 (0.49)	14.57 (0.85)	15.07 (0.87)	32.30 (1.22)	11.09 (1.78)	22.00 (1.93)	0.0022
SSRI	25.26 (0.62)	18.40 (1.04)	7.13 (0.97)	28.27 (1.42)	17.00 (1.93)	11.30 (2.15)	0.0278
GCBT + SSRI	28.24 (0.42)	15.76 (0.68)	12.62 (0.72)	30.19 (1.03)	13.90 (1.45)	16.65 (1.87)	0.0132

GCBT group cognitive behavioral therapy, *OCD* obsessive-compulsive disorder, *PTSD* post-traumatic stress disorder, *SSRI* selective serotonin reuptake inhibitors, *YBOCS* Yale-Brown Obsessive-Compulsive Scale

* Non-parametric analysis of ordinal data with repetitive measures; level of significance = 0.05

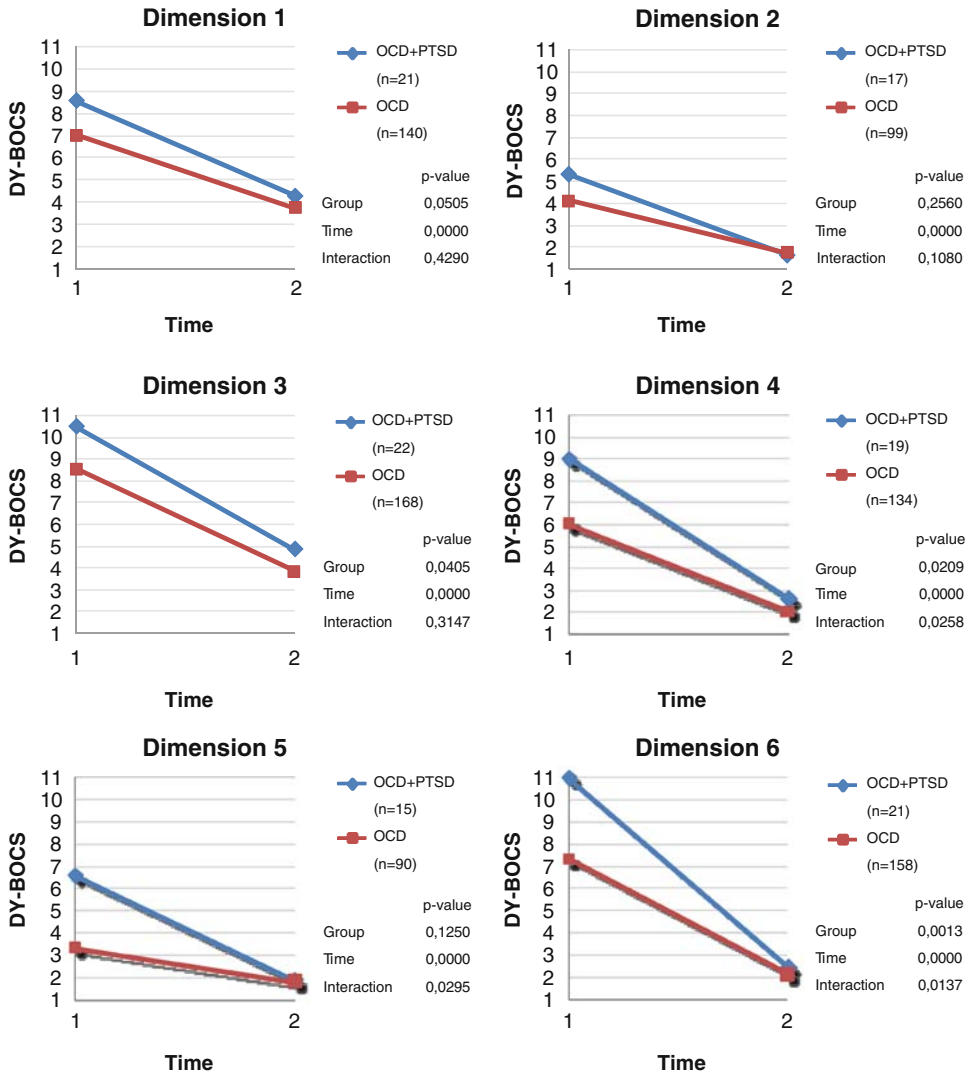

Fig. 1 Time 1 = baseline; Time 2 = post-treatment, 12th week. DYBOCS: Dimensional Yale-Brown Obsessive-Compulsive Scale; Dimension 1 = aggression, violence, disaster obsessions and compulsions; Dimension 2 = sexual and religious obsessions and compulsions; Dimension 3 = symmetry, ordering, counting and arranging obsessions and compulsions; Dimension 4 = contamination and cleaning obsessions and compulsions; Dimension 5 = hoarding obsessions and compulsions; Dimension 6 = miscellaneous obsessions and compulsions; OCD = obsessive-compulsive disorder; PTSD = post-traumatic stress disorder; shaded lines correspond to significant results

Table 3 Variation [mean (SE)] in depression and anxiety symptoms in the OCD without PTSD and OCD + PTSD groups from baseline to post-treatment

	Group						*p* value*
	OCD without PTSD ($n = 184$)			OCD + PTSD ($n = 21$)			
	Baseline	12th week	Difference	Baseline	12th week	Difference	
BDI scores	14.69 (0.82)	11.84 (0.83)	2.70 (0.62)	22.23 (3.01)	12.90 (2.45)	8.29 (1.76)	0.073
BAI scores	13.44 (0.75)	11.15 (0.79)	1.89 (0.73)	19.41 (2.85)	13.86 (2.45)	5.38 (1.88)	0.003

BAI Beck Anxiety Inventory, *BDI* Beck Depression Inventory, *OCD* obsessive-compulsive disorder, *PTSD* post-traumatic stress disorder

* Mann–Whitney test, level of significance = 0.05

hypotheses were that the presence of traumatic experiences or PTSD in OCD patients would have a negative impact on OCD treatment and that the earlier the age of the first trauma, the greater this impact would be.

Contrary to our expectations, presence of HT or PTSD in patients with OCD did not negatively affect the response to OCD treatment. As no significant results were found for the HT group, where HT and PTSD were analyzed together, it seems that meeting full criteria for PTSD was a more important variable in regards to outcome. Final scores for the severity of OCD symptoms of patients of the OCD + PTSD group were similar to those of the OCD without PTSD group. Besides, the OCD + PTSD group presented greater treatment response concerning

contamination/cleaning, hoarding, and miscellaneous symptoms (including superstitious symptoms, mental rituals and illness obsessions). There was no association between age of the first trauma and response to treatment, nor could we find significant differences in outcome between groups with OCD onset before, concurrent with or after PTSD.

In this sample, 38 subjects (17.67% of the whole sample) met criteria for positive HT and 22 subjects (57.89% of the OCD + HT group and 10.23% of the whole sample) met full DSM-IV criteria for PTSD. These frequencies are smaller than those reported by Gershuny et al. [13] and higher than those reported by Grabe et al. [15]. In the first study, involving 104 treatment-resistant patients, 82% of the sample had experienced at least one trauma, with a 39.4% overall frequency of PTSD [13]. A much lower rate of trauma-related disorders was found in the second study: 2.9% occurring before and 1.5% occurring within the same year as the onset of OCD [15]. The later study recruited OCD patients from four German university hospitals included in a family study of OCD. The rate of PTSD in our sample of non-treatment-resistant OCD subjects was closer to the 6.8% previously reported in the community [22].

Despite all the evidence suggesting variable connections between trauma or PTSD and OCD, we are aware of no previous published report that has presented data on response to systematic, conventional treatment in a relatively large sample of OCD patients with HT, or comorbid PTSD. Investigations of traumatized clinical samples have shown that, in addition to the onset of PTSD, comorbid OCD may emerge after exposure to traumatic events, and symptoms of aggressive and contamination content may develop in close association with the traumatic event [8, 12, 24, 26]. Experimental research focusing on general stress in nonclinical samples showed increased intrusive thoughts in response to stressful and aversive experiences [19, 20]. In a recent study, presence of one or more traumas was associated with increased OCD symptom severity, and this relationship remained significant despite controlling for age, OCD age of onset, comorbidity, and depressive symptoms [6]. From a biological point of view, it has been suggested that changes in the serotonergic system and a state of hypermetabolism in the orbitofrontal cortex account for the co-occurrence patterns and symptom overlap between OCD and PTSD [6]. The psychological perspective has hypothesized the existence of a dynamic comorbidity between OCD and PTSD disorders due to cognitive factors, such as catastrophic misinterpretations of natural trauma-related intrusive thoughts [8]. An interesting review on genetic and environmental influences on OCD points to a hypothetical genetic predisposition to cognitive biases that could interact with environmental stressors and lead to OCD [17]. The authors speculate that a functional polymorphism in a particular gene may lead to a neurocognitive profile (e.g., problems with cognitive inhibition) or a personality profile (perfectionism, excessive responsibility) that would predispose an individual to develop OCD symptoms after certain types of environmental stress [17]. It has also been suggested that OCD may be a way of coping with PTSD symptomatology through avoidance and inhibition of affective processing [12]. Another aspect to be considered is that OCD onset after clinically significant trauma may constitute a distinctive subtype of OCD, possibly more related to mood and anxiety disorders. This hypothesis has some empirical support. Studying a larger sample that included the patients of the present study, Fontenelle et al. (personal communication) compared 31 patients who developed OCD prior to PTSD with 34 patients who developed OCD after the onset of PTSD. "Post-traumatic OCD" was associated with later onset; increased rates of obsessions with aggressive content; higher levels of "suicidality"; greater severity of comorbid depression, anxiety, and certain types of obsessive-compulsive symptoms (i.e., aggression, symmetry, and miscellaneous); increased rates of mood, anxiety, impulse-control, and tic disorders; and, interestingly, a family history with greater frequencies of PTSD, major depressive disorder, and generalized anxiety disorder, with a trend toward a lower frequency of OCD.

In terms of impact on treatment response, Sasson et al. [28] studied the occurrence of PTSD and OCD after exposure to war in 13 soldiers. In all cases, both disorders appeared after combat. Conventional treatment for both disorders was offered, with a poor response among all cases. The authors reported that, for this subject population, the course appears to be less favorable compared with that in non-PTSD-related OCD, and propose that OCD stemming from trauma is a distinct subtype of OCD [28]. Gershuny et al. [11, 13], in two different studies with treatment-resistant OCD patients, also observed an association between the comorbidity with PTSD and the condition of refractoriness to OCD treatment. One way of interpreting our contrasting results would be to consider that, differently from previous investigations, patients were not treatment-resistant a priori. Therefore, we might consider that the association of PTSD comorbidity with a poorer outcome is more likely in OCD patients with unsuccessful previous treatments. For non-treatment-resistant OCD patients, PTSD comorbidity does not seem to be an important prognostic factor. In this sample, the relationship of OCD and PTSD has influenced the clinical presentation and severity of patients at pre-treatment, but did not alter the prognosis, once both groups had similar final symptom severity. The main clinical implication of these findings would be that, although trauma and PTSD

may have a strong influence on the onset and clinical expression of OCD, it is possible that their occurrence does not necessarily impair OCD treatment outcome.

PTSD comorbidity was associated with greater improvement in symptoms such as contamination obsessions and cleaning compulsions; collecting and hoarding; and miscellaneous obsessions and related compulsions (including illness concerns, mental rituals and superstitious symptoms, among others) (Fig. 1). Although the evidence for this association remains limited, the quantitative assessment of specific OCD symptom dimensions is an original aspect of this investigation. The symptom dimensions approach allow for the investigation of OCD subgroups of patients that are potentially more etiologically and genetically homogenous. This approach may be relevant for linking particular genetic variations to OCD. For instance, the religious/somatic obsessions subtype of OCD has been associated with the 5-HTTLPR polymorphism, whereas there is some evidence that hoarding is highly heritable, being the site 4q34 a region of interest for this subtype of OCD [17]. It could be hypothesized that, in the present sample, the combination of genetic factors with PTSD comorbidity was involved in the pattern of treatment response observed in the different symptom dimensions subgroups. Unexpected findings regarding the pharmacological treatment of hoarding have been recently reported by Saxena et al. [29]. Also in contrast with the previous literature, these authors observed that SSRIs were just as effective for compulsive hoarders as for non-hoarding OCD patients. However, a limitation of this study was the lack of a specific rating scale to measure hoarding severity. Consequently, the authors were not able to measure improvement in hoarding/saving symptoms separately from other OCD symptoms in their sample, and the decline in YBOCS scores seen in compulsive hoarders might have been due to improvements in their other, non-hoarding OCD symptoms [29]. In another study, obsessions/checking and symmetry/ordering were two of four symptom factors specifically associated with the occurrence of trauma [6]. No evidence has been found linking trauma or PTSD to treatment response of specific OCD symptoms of contamination obsessions and cleaning compulsions or the miscellaneous obsessions and related compulsions. In summary, the existent literature offers little help to interpret the association between certain symptom dimensions with more dramatic improvement over others. For this reason, these findings should be considered as preliminary, although important in generating new paths for research.

Limitations of this study include the sample size, which allowed for only a small number of patients with OCD and comorbid PTSD to be studied, and the relatively short duration of treatments. Nevertheless, the duration of treatment is in accordance with most treatment outcome studies available to date. In addition, our group has been following these patients and admitting new ones in the same treatment protocol, so that, in the near future, data on the long-term outcome of OCD patients with PTSD comorbidity are expected to be reported in a larger sample. Another limitation is the lack of control of the distribution of possible confounding variables in the OCD without PTSD and OCD + PTSD groups, mainly psychiatric comorbidities that are expected to influence the occurrence of traumatic events, such as alcohol and drug abuse and impulse-control disorders, or conditions that have been reported to influence OCD treatment response, such as tic disorders and social phobia. It is important to consider that this investigation stemmed from a practical clinical trial designed to compare two-first-line treatments for OCD, GCBT, and SSRIs. Therefore, it did not allow for the exclusion or a balanced distribution of additional psychiatric comorbidities in the two groups. Such conditions may have had a bigger effect on the differences found between the two groups than PTSD alone. Nonetheless, although possible confounders were analyzed, such as gender and current age in the OCD without PTSD and OCD + PTSD groups, there were no significant associations.

In conclusion, we showed that presence of HT or PTSD comorbidity in patients with OCD did not negatively affect the response to OCD conventional treatment. Besides, preliminary analyses demonstrated a greater response concerning specific OCD symptom dimensions in the OCD + PTSD group when compared to the OCD without PTSD group. The factors associated with a greater susceptibility to change in the OCD + PTSD group and the reasons for the same group being more prone to improve in specific symptom dimensions could not be explained in this study. Nevertheless, these new findings raise relevant issues for future research, such as the need for treatment outcome studies in OCD that focus on presence of HT or PTSD comorbidity, and further investigation on how first-line treatments for OCD work for each specific symptom dimension when there is HT or PTSD.

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