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Obsessive–compulsive symptoms interact with disorganization in influencing social functioning in schizophrenia

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ABSTRACT

Objective: Recent research has suggested a dual impact of obsessive–compulsive dimension on functioning in schizophrenia with a gradual transition from an improving to a worsening effect depending on obsessive–compulsive symptoms (OCS) severity (from mild to moderate–severe). Aim of the present study was to investigate whether this varying effect of OCS on functioning might be mediated or moderated by schizophrenia symptom dimensions or occur independently.

Method: Seventy-five patients affected by schizophrenia were administered the Structured Clinical Interview for DSM-IV Disorders, the Positive and Negative Syndrome Scale, the Yale-Brown Obsessive–Compulsive Scale and the Social and Occupational Functioning Assessment.

The sample was divided into two groups according to the severity of OCS (absent/mild and moderate/high OCS group).

Results: In both groups, the effect of OCS on functioning was not mediated by their effect on positive, negative or disorganization symptoms. Conversely, a significant interaction between OCS and disorganization dimension was found: the dual effect of OCS on functioning occurred only among patients with low disorganization symptoms while it was no more apparent at high levels of disorganization.

Conclusion: Data suggest that in patients with schizophrenia, functioning at least in part depends on the interaction between disorganization and OCS.

1. Introduction

A growing literature suggests that obsessive–compulsive symptoms (OCS) would represent a distinct and clinically relevant dimension in schizophrenia (Poyurovsky et al., 2012), since the occurrence of OCS has been associated with worse clinical outcome and greater disability (de Haan et al., 2013a, 2013b; Lysaker and Whitney, 2009; Tiryaki and Ozkorumak, 2010; Üçok et al., 2014). However, recent studies questioned the assumption of an adverse effect of OCS on functioning in schizophrenia. For instance, as compared to full-blown obsessive–compulsive disorder (OCD), mild OCS (i.e., symptoms below the diagnostic threshold for OCD) have been found to improve functioning (de Haan et al., 2013a). Furthermore, Tonna et al. (2015a) demonstrated a gradual transition from a positive effect to an adverse impact on functioning depending on the OCS severity (from mild to moderate–severe). Interestingly, these results are consistent with the early hypothesis that OCS (at a mild level) might be considered a compensatory attempt to mitigate the course of schizophrenia (Jahrreiß, 1926; Rosen, 1957; Stengel, 1945).

The complex relationship between OCS and social functioning is not yet clarified: specifically, research has not yet evaluated whether OCS influence functioning independently from the effect exerted by positive, negative and disorganization symptoms of schizophrenia or whether OCS and schizophrenic symptoms interact with each-others to affect functioning.

Three major hypotheses may be advanced: 1) OCS might influence functioning as a result of the association with other schizophrenia symptoms; that is, the effect of OCS on functioning would be mediated by schizophrenia symptom dimensions; 2) OC and schizophrenia symptom dimensions are independent from each-others; nonetheless they might interact in affecting social functioning; 3) OC and schizophrenia symptom dimensions are not associated and do not interact with each-others in impacting functioning.

To our knowledge, no study has yet investigated the interplay between OCS and schizophrenia symptom dimensions with respect to global functioning, even though the association between OCS and symptoms of schizophrenia has been extensively investigated. Since neither a consistent pattern of association (de Haan et al., 2013a, 2013b; Poyurovsky et al., 2012) nor a specific clinical profile (Devi

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et al., 2015) have been found, it has been suggested that OC dimension would be independent from other symptom dimensions.

Further, most studies assessing the pattern of association between OCS and schizophrenia symptoms used a categorical approach to OCS (patients with OCD vs patients with sub-threshold OCS). In recent years a dimensional approach to schizophrenia has been strongly emphasized; indeed, the heterogeneity in clinical expression and in the course of the disease may be better explained by a dimensional model (Insel, 2010; Tandon et al., 2009). According to this view, schizophrenia represents a "complex" syndrome constituted by relatively distinct psychopathological dimensions, which may interact with each-others in affecting the levels of functionality (Keshavan et al., 2008; Tandon et al., 2009).

Therefore, the present study aimed to elucidate the interplay between OCS and positive, negative and disorganization symptoms of schizophrenia in affecting psychosocial functioning, using a dimensional approach. We investigated whether the previously described varying effect of OCS on functioning (i.e., a positive effect at mild levels of OCS, and an adverse effect at moderate/high levels of OCS (Tonna et al., 2015a) occurs independently from that of schizophrenic symptoms or through specific patterns of associations. Specifically, two alternative hypotheses were evaluated: a) whether the influence of OCS on functioning would be explained by their mitigating or worsening effect on schizophrenia symptoms (mediation hypothesis); b) whether the impact of OCS on functioning would vary as a function of the severity of the diverse schizophrenia symptoms (moderation hypothesis).

2. Material and methods

2.1. Participants

The study enrolled schizophrenic patients who consecutively sought treatment at the Psychiatric Unit of the University Hospital of Parma from January 2012 to December 2013. Patients were included in the study if 1) they were aged over 17 years; 2) they received a diagnosis of schizophrenia, according to DSM-IV criteria (APA, 2000); 3) a written informed consent to study participation was obtained. Patients were excluded if they were affected by 1) a current mental disorder related to a general mental condition or to a drug- or alcohol abuse or dependence 2) a cognitive disorder (Mini-Mental State Examination score lower than 25) which could impair the compliance with testing procedures.

Age at onset has been defined as the age of the appearance of the first psychotic symptoms.

Moreover, in order to guarantee that the full range of severity of the obsessive–compulsive dimension was equally represented in the study sample, at least the first 30 patients with absent-mild OCS (Yale-Brown Obsessive–Compulsive Scale (YBOCS) score lower than 16) and the first 30 patients with moderate–severe OCS (YBOCS higher than 15) were included in the study (Goodman et al., 1989).

All patients were treated with antipsychotics. Patients who had moderate–severe OC symptoms also received a serotoninergic medication.

2.2. Procedures

All patients completed: 1) the Structured Clinical Interview for DSM-IV Disorders (SCID-IV) (Mazzi et al., 2000); 2) the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987) for the evaluation of positive, negative and general psychopathology symptoms; 3) the Yale-Brown Obsessive–Compulsive Scale (YBOCS) (Goodman et al., 1989) for the assessment of OCS; 4) the Social and Occupational Functioning Assessment Scale (SOFAS) (APA, 2000) for the evaluation of the level of functioning.

According to DSM-IV diagnostic criteria, recurrent and persistent thoughts that were not related to individual delusional themes and hallucinations and were recognized by patients as intrusive, inappropriate and a product of his/her own mind were considered as obsessions. Similarly, repetitive behaviors that the person felt driven to perform in response to an obsession and that were not interrelated with the content of delusions and/or hallucinations were defined as compulsions.

The study focused on three PANSS scores representing definite schizophrenia symptom dimensions: positive symptoms, negative symptoms, and disorganization. The disorganization score was computed by summing the items of conceptual disorganization (P2) and mannerisms and posturing (G5), according to the criteria suggested by the Schizophrenia Remission Working Group (RSWG) (Andreasen et al., 2005). PANSS general psychopathology and total scores were also computed for descriptive purposes. A trained psychiatrist interviewed patients after the resolution of the acute phase of illness in order to guarantee an adequate cooperation to the assessment.

2.3. Statistical analysis

To evaluate the primary hypotheses of the study, analyses were conducted in three steps.

Firstly, patients were divided into two groups, based on the threshold value corresponding to the inflection point of the fitted curve (YBOCS score = 14) previously found (Tonna et al., 2015a); in fact, increasing OCS were associated with better functioning up to a YBOCS value of 14 and with decreased functioning above this value. Thus, the first group included subjects reporting YBOCS score <14 (absent/mild OCS), whereas the second group included patients with a YBOCS score ≥14 (moderate/severe OCS). The socio-demographic and clinical features of the two groups were compared using the two-tailed Student's t test for continuous variables and Fisher's exact test for categorical variables. We expected the absent/mild OCS group to exhibit higher SOFAS scores than the moderate/high OCS group.

Secondly, we investigated the relationship between YBOCS score, schizophrenia symptoms and SOFAS score in each patient group using Spearman's correlations (two tailed). We expected OCS to be positively related with SOFAS scores in the absent/mild OCS group, but inversely related with functioning in the moderate/high OCS group. Correlations between the primary study variables and socio-demographic features were also computed.

Finally, we examined whether the varying effect of OCS on psychosocial functioning in the two groups a) would be mediated by the severity of schizophrenia symptoms dimensions; or b) would be moderated by the severity of schizophrenia symptoms dimensions. The mediation analysis aims to clarify how or why OCS would influence functioning (i.e., through their potential worsening or ameliorating effect on schizophrenia symptoms); the moderation analyses aims to clarify when or for whom OCS differentially impact functioning (i.e., at high or low levels of schizophrenia symptoms). For these aims, we used Hayes (2013) procedure for indirect (i.e., mediation) and conditional (i.e., moderation) effects. This regression-based procedure makes no assumption about the normality of the data and is tolerant of smaller samples by utilizing 5000 bootstrap resamples to estimate a confidence interval of an effect.

Thus, three mediation analyses (PROCESS for SPSS, Model #4) were performed in each sub-group (i.e., absent/mild OCS group and moderate/high OCS group) in order to assess whether schizophrenia symptoms (PANSS positive, disorganization and negative symptoms: proposed mediators) would mediate the relationship between OC symptom severity (independent variable: YBOCS score) and SOFAS score (dependent variable). Therefore, these mediation analyses could clarify whether OCS influence the severity of the various schizophrenia symptoms, which in turn would impact functioning, in both the absent/mild OCS and moderate/high OCS groups.

Then, three moderation analyses (PROCESS for SPSS, Model #1) were performed in each sub-group to evaluate whether OC symptom severity (independent variable: YBOCS score) predicted functional

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