Obsessive-compulsive symptoms (OCS) and obsessive-compulsive disorder (OCD) occur in a substantial proportion of patients with schizophrenia at rates that range from 10% to 64% and from 7.8% to 31.7%, respectively. Indeed, a growing body of evidence suggests that the OC dimension in schizophrenia is independent of nuclear psychotic symptoms and markedly affects both social functioning and prognosis. Despite the difficulty in differentiating obsessions from delusions and compulsions from stereotypic behavior, OCS can be reliably unraveled in schizophrenia using the same instruments that are used to diagnose OCD, such as the Yale-Brown Obsessive-Compulsive Scale (YBOCS). Nevertheless, few studies have investigated the psychopathologic profile of OC symptoms in schizophrenia, in comparison with pure OCD. Most studies have failed to find significant differences in OC symptoms in schizophrenia compared with OCD, thus leading to the conclusion that patients with schizophrenia exhibit an OC symptom profile comparable to that observed in OCD. Consistent with these findings, a preferential aggregation of OC spectrum disorders (body dysmorphic disorder and tic disorders) has been identified in schizophrenia, further suggesting that OC phenomena represent a separate psychopathologic dimension that is indistinguishable from genuine OCD. In contrast, other studies have found specific differences between the 2 groups in terms of obsessive content, with higher rates of hoarding obsessions in patients with schizophrenia and symmetry obsessions in patients with OCD. Interestingly, some researchers have suggested that OC symptoms may be related to themes in delusions or hallucinations: in other words, that OC and psychotic features might coexist in a unique psychopathologic complex.
To date, given the available data, it has not been possible to clarify whether patients with schizophrenia show a profile of OC features that can be distinguished from that in patients with pure OCD. This difficulty is due in part to methodological discrepancies across studies, including the different cut-off levels adopted for obsessive symptomatology (OCS vs. OCD),1,8 the type of psychotic patients who were recruited (patients with schizophrenia vs. those with psychotic spectrum disorders),4 and the lack of an extensive assessment of OC contents.

Within this controversial framework, the goal of this study was to investigate the clinical features of OC phenomena in patients with schizophrenia compared with a group of patients with “pure” OCD, using a dimensional rather than a categorical approach.

MATERIALS AND METHODS

Participants

The study sample consisted of 66 patients [37 male (56.1%) and 29 female (43.9%), with a mean age of 40.03±11.28 y] who consecutively sought treatment at the Psychiatric Unit of the University Hospital of Parma between January 2013 and December 2013 for schizophrenia or OCD. Inclusion criteria were (1) age above 17 years, (2) a diagnosis of schizophrenia or OCD according to DSM-IV-TR9 criteria, (3) a YBOCS total score >7, and (4) written informed consent. Schizophrenia was diagnosed in 35 patients and OCD in 31 patients.

Patients with the following conditions were excluded from the study: (1) a mental disorder related to a general medical condition, (2) a substance use disorder, and (3) cognitive impairment that might affect the testing procedures (score on the Mini-Mental State Examination <25).

The study was approved by the Ethics Committee of the University Hospital of Parma and was conducted according to the ethical standards of the 2013 Declaration of Helsinki.

Symptom Ratings

All participants were administered a series of both structured interviews and self-report instruments. The clinician-administered rating scales included (1) the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I),10 (2) the Positive and Negative Syndrome Scale (PANSS)11 for the evaluation of positive, negative, and general psychopathology symptoms, and (3) the YBOCS12 for the assessment of OC symptoms. The Leyton Obsessional Inventory (LOI),13 a subjective self-report instrument for the assessment of obsessive symptoms and traits, was adopted to investigate OC contents more extensively.

Clinical assessments were carried out by 2 trained psychiatrists with clinical experience with both schizophrenia spectrum disorders and OCD, who were trained in the use of the rating instruments. During the enrollment period of the study, the 2 raters met regularly with the first author to discuss the scored protocols; uncertainties were discussed until a consensus was reached.

The sample was divided into 2 groups on the basis of their DSM-IV-TR Axis I disorder: the schizophrenia group (n=35) and the OCD group (n=31). Repetitive thoughts or behaviors that were recognized by the patients as intrusive, inappropriate, and products of their own minds were considered as obsessions and compulsions. If the thought content was related to delusional themes and hallucinations, ego-dystonic characteristics were required to define it as an OC symptom, according to the recently suggested criteria for the schizo-obsessive subtype of schizophrenia.2 To guarantee adequate cooperation, patients were assessed after the resolution of the acute phase of the illness.

Treatment

All patients with schizophrenia were treated with antipsychotic medications. Patients who had moderate-severe OC symptoms also received a serotonergic drug. All patients with OCD were treated with a serotonergic drug and with low doses of antipsychotic medications as augmentation if they had a poor response to a serotonergic drug. Moreover, weekly cognitive-behavioral therapy was administered in both groups for 3 months for patients with moderate-severe OC symptoms.

Statistical Analysis

Sociodemographic and clinical features of the 2 diagnostic groups were compared using the 2-tailed Student t test. In the overall sample, Pearson correlations (2-tailed) were used to assess the relationship between psychotic symptoms (delusions
RESULTS

Participants

Sociodemographic characteristics of the 2 groups of patients are shown in Table 1. The patients with schizophrenia did not differ significantly from the patients with OCD in terms of their sex, age, age of onset of psychosis, age of onset of OCD, illness duration, or education level. As expected, patients with schizophrenia exhibited significantly lower indices of social functioning (marital status and employment status) and a higher number of hospitalizations than patients with OCD.

Psychopathologic Variables

Clinical characteristics of the 2 groups are shown in Table 2. Patients in the groups with schizophrenia and OCD did not differ significantly in YBOCS total scores or in total scores on obsessions and compulsions. Likewise, no differences were found for YBOCS resistance, interference, time, and control for both obsessions and compulsions (ie, how much symptoms are actively resisted by the patient, interfere with normal functioning, occupy the patient’s time, and how much control the patient has over symptoms). However, the group with OCD exhibited higher levels of distress for both obsessions and compulsions than the group with schizophrenia. Concerning OC contents, whereas compulsive behaviors were similar in both groups, there were more aggressive, contamination-related, sexual, and somatic obsessions in the group with OCD than in the group with schizophrenia.

The Association Between the Severity of OC and Psychotic Symptoms

The YBOCS total scores and the subtotal scores for obsessions and compulsions were not associated

| TABLE 1. Sociodemographic and Clinical Variables |
|-----------------------------------------------|
| Schizophrenia (N=35) | OCD (N=31) |
|----------------------|------------|
|                      | n (%)      | F     | P    |
| Sex                  |            | 0.09  | 0.48 |
| Male                 | 19 (54.3)  | 18 (58.1) |
| Marital status       |            | 17.53 | 0.00 |
| Never married        | 30 (85.7)  | 14 (45.2) |
| Married              | 2 (5.7)    | 16 (51.6) |
| Divorced/widowed     | 3 (8.6)    | 1 (3.2) |
| Employment status    |            | 10.04 | 0.00 |
| Not employed         | 27 (77.1)  | 12 (38.7) |
| Employed/student     | 8 (22.9)   | 19 (61.3) |
| Living status        |            | 0.60  | 0.33 |
| Lives alone          | 7 (20.0)   | 4 (12.9) |
| Lives with someone   | 28 (80.0)  | 27 (87.1) |
| Mean±SD              |            |       |      |
| Age (y)              | 37.51±9.31 | 42.87±12.71 | 1.96 | 0.054 |
| Education (y)        | 10.94±3.96 | 12.32±3.35 | 1.51 | 0.134 |
| Age at onset (y)     | 25.49±7.23 | 25.9±12.44 | 0.164 | 0.871 |
| Illness duration (y) | 11.77±9.43 | 16.65±13.81 | 1.65 | 0.105 |
| Hospital admissions (n) | 3.86±4.42 | 1.55±1.99 | −2.7 | 0.008 |

*F is the Fisher exact test.
OCD indicates obsessive-compulsive disorder
Values in bold are statistically significant.
with PANSS scores, with the exception of the PANSS score for general psychopathology symptoms. Nor was any association found between specific items on the PANSS and the YBOCS.

**The Relationship Between OC Contents and Psychotic Symptoms**

In the group with schizophrenia, a positive relationship was found between delusions and washing compulsions ($P=0.048$) and between delusions and hoarding obsessions ($P=0.023$).

**DISCUSSION**

This study investigated the psychopathology (content and form) of OC phenomena in patients with schizophrenia compared with patients with pure OCD. To our knowledge, this is the first study that has investigated this topic adopting a dimensional...
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approach. In addition, for the first time, OC contents were evaluated using 2 different assessment scales: the YBOCS and the LOI.

The form of obsessions and compulsions was similar in the 2 groups. No differences were found in severity (ie, total scores on the YBOCS and subtotal scores on obsessions and compulsions); nor were differences found in scores on YBOCS resistance, interference, time, and control; only the YBOCS scores for distress were higher in the group with OCD. The similarity in the form of obsessions and compulsions found in this study is consistent with previous studies\(^2\),\(^{14}\) and lends additional support for the existence of a distinct OC dimension in schizophrenia.

With regard to obsessive contents, the data in this study revealed a different profile between schizophrenia and OCD: whereas all typical obsessive contents were fully represented in the patients with OCD, the patients with schizophrenia showed a narrow variety of classic obsessive themes. In particular, aggressive, contamination-related, sexual, and somatic contents were less represented in the group with schizophrenia than in those with OCD, whereas the frequency of other types of obsessions (hoarding, religious, and symmetry) did not differ significantly between the 2 groups.

Although the presence of hoarding obsessions in schizophrenia is consistent with findings from a recent study by Frias et al.,\(^4\) it should be taken into account that, in our patients with schizophrenia, religious obsessions, although egodystonic, were less clearly distinguishable from delusions. Interestingly, and in contrast to the findings of Frias and colleagues, who found higher rates of symmetry obsessions in patients with OCD than in those with schizophrenia, in our study, no difference was found in the frequency of symmetry obsessions between the 2 groups. The reason for this discrepancy is likely related to the use of a more comprehensive assessment of OC contents, using the LOI in addition to the YBOCS.

Schizophrenia and OCD share similar cortical-subcortical pathways; in particular a frontal-striatal-thalamic-cortical circuit has been implicated in both illnesses with specific patterns of prefrontal functional impairment.\(^15\),\(^16\) Specifically, hypoactivity of the dorsolateral prefrontal cortex appears to be primarily involved in schizophrenia, affecting working memory,\(^17\)–\(^19\) whereas hyperactivity of the orbitofrontal cortex appears to be predominantly implicated in OCD,\(^20\),\(^21\) with a defect in emotional processing.\(^22\) On the one hand, the significant overlap in the implicated structures may explain the frequent co-occurrence of OC and schizophrenia symptoms; on the other, the specific patterns of prefrontal cortical impairment in schizophrenia and OCD may explain the narrower range of obsessional themes in schizo-obsessive patients than in patients with “pure” OCD. In fact, as OC symptom dimensions are mediated by distinct and highly conserved neural systems within the fronto-striato-thalamic loops,\(^23\) the more restricted range of obsessive contents found in patients with schizophrenia in this study may suggest that, unlike in pure OCD, some neural systems are preferentially involved in schizophrenia. Future research should be addressed to clarify the pathophysiological mechanisms underlying the obsessive dimension in schizophrenia. In contrast to the findings concerning obsessions, compulsions did not differ in the 2 groups, which is consistent with the majority of data in the literature.\(^2\)

Finally, this study sought to investigate the possible aggregation of OC and psychotic symptoms into complex symptom phenomena, a concept previously suggested by Porto et al.\(^7\) In our study, the OC dimension appeared to be independent of schizophrenia symptom dimensions, confirming previous results\(^24\)–\(^26\), thus, we failed to find a relationship between YBOCS scores and PANSS positive, negative, and disorganization scores. However, with regard to specific OC contents, a positive correlation was found between delusions and washing compulsions and between delusions and hoarding obsessions. This result appears to confirm that the content of obsessions and compulsions may be interrelated with the content of delusions,\(^2\) even though OCS and delusions were not related in terms of their severity. In other words, OCS themes, although egodystonic, may aggregate with delusional themes, into a unique and significant construct.\(^2\),\(^7\),\(^27\) One could speculate that the considerable overlap in implicated structures involving “open” parallel cortical-subcortical circuits (ie, allowing connections between various substructures)\(^15\) may facilitate the interrelation between obsessive and delusional contents.

Our study had a number of limitations. First, given the cross-sectional design of the study, the
possibility cannot be excluded that OCS may fluctuate over the course of the disease and change over time in their psychopathologic features; this phase-dependent effect on OCS has not been investigated. Second, the possibility that the OCS were induced by atypical antipsychotic drugs could not be evaluated in the sample population.

In conclusion, this study suggests that the psychopathology of the obsessive dimension in schizophrenia is somehow modeled by the underlying psychotic disorder, with the preferential recruitment of specific obsessive contents (namely, hoarding and symmetry obsessions) and with the tendency of delusional and obsessive contents to interrelate into unique symptom phenomena.

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