Comparison of Clinical Characteristics and Comorbidity in Schizophrenia Patients With and Without Obsessive-Compulsive Disorder: Schizophrenic and OC Symptoms in Schizophrenia

Michael Poyurovsky, M.D.; Victoria Kriss, M.D.; Gregory Weisman, M.D.; Sarit Faragian, M.A.; Rena Kurs, B.A.; Michael Schneidman, M.D.; Camil Fuchs, Ph.D.; Abraham Weizman, M.D.; and Ronit Weizman, M.D.

Background: Since a substantial proportion of schizophrenia patients has symptoms of obsessive-compulsive disorder (OCD), we sought to provide a phenomenological characterization of a schizophrenia subgroup with OCD.

Method: A consecutive sample of patients who met DSM-IV criteria for both schizophrenia and OCD (N = 55) was compared with 55 schizophrenia patients without OCD matched for age and number of hospitalizations. Structured Clinical Interview for DSM-IV Axis I psychiatric disorders (SCID-I), including a specific module for tic disorders based on DSM-IV criteria, Scales for the Assessment of Positive and Negative Symptoms, Yale-Brown Obsessive-Compulsive Scale, Clinical Global Impressions scale, and Hamilton Rating Scale for Depression were used.

Results: Schizophrenia patients with OCD (N = 55) had lower positive dimension scores than schizophrenia patients without OCD (N = 55) (p = .01). Two subgroups of schizo-obsessive patients were identified: OCD independent of schizophrenia symptoms and OCD partially overlapping positive schizophrenia symptoms. Schizophrenia patients with OCD had more SCID-detectable OCD-spectrum disorder, primarily body dysmorphic disorder and chronic tic disorders. More schizophrenia patients with OCD were treated with either add-on serotonin reuptake inhibitors or clozapine.

Conclusion: Schizophrenia patients with OCD differ from their non-OCD–schizophrenia counterparts in severity of schizophrenia symptoms, co-occurrence of OCD-spectrum disorders, and pharmacotherapy. These findings and the identification of 2 subgroups of schizo-obsessive patients support the validity of this unique clinical entity and may facilitate the establishment of diagnostic criteria for a schizo-obsessive subtype of schizophrenia.

(J Clin Psychiatry 2003;64:1300–1307)

Received Feb. 5, 2003; accepted May 27, 2003. *From the Research Unit, Tirat Carmel Mental Health Center, Tirat Carmel (Drs. Poyurovsky, Kriss, Weisman, and Schneidman and Ms. Faragian); Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa (Dr. Poyurovsky); Sha'ar Menashe Mental Health Center (Ms. Kurs), Department of Statistics and Operations Research (Dr. Fuchs), and Sackler Faculty of Medicine (Drs. Weizman and Weizman), Tel Aviv University, Tel Aviv; Tel Aviv Mental Health Center, Tel Aviv (Dr. R. Weizman); and Geha Mental Health Center, Petah Tiqva (Dr. A. Weizman), Israel.*

In the spirit of full disclosure and in compliance with all ACCME Essential Areas and Policies, the faculty for this CME activity were asked to complete a full disclosure statement. The information received is as follows: Drs. Poyurovsky, Kriss, Weisman, Schneidman, Fuchs, Weizman, and Weizman and Mss. Faragian and Kurs have no significant commercial relationships to disclose relative to the presentation.

Corresponding author and reprints: Michael Poyurovsky, M.D., Tirat Carmel Mental Health Center, 9 Eshkol Street, Tirat Carmel, Israel (e-mail: tyrmichael@matat.health.gov.il).

According to recent reports, an estimated 7.8% to 46% of schizophrenia patients also have obsessive-compulsive disorder (OCD),[1–6] a considerably higher incidence than in the general population (1.2%–2.4%),[7] suggesting a possible pathophysiologic linkage between the 2 disorders.[2]

Obsessive-compulsive (OC) symptoms may precede the onset of schizophrenia, occur as a prodromal phase, or aggravate the progression of the disease. Recent investigations demonstrate that schizophrenia and OCD comorbidity is generally characterized by lower levels of social functioning,[2,6,8,9] longer duration of hospitalizations,[2,8,9] more neurocognitive deficits,[9,10] and treatment resistance.[11–14] The effect of OCD on schizophrenia symptomatology remains unclear, with studies reporting both greater[2,15,16] and lower[5,15,17] symptom severity, and yet others showing no significant difference.[6,10] The major limitations of these studies are inclusion of predominantly chronic patient populations, lack of well-matched control groups, and small sample sizes. Furthermore, although schizophrenia with OCD has been included in OCD-spectrum disorders,[18] the rate of OCD-related comorbidities (body dysmorphic disorder, hypochondriasis, eating disorders, Tourette's syndrome, and chronic tic disorder)

Table 1. Demographic and Clinical Characteristics of Schizophrenia Patients With and Without Obsessive-Compulsive Disorder (OCD)

Variable	Schizophrenia With OCD (N = 55)	Schizophrenia Without OCD (N = 55)	Statistic	p
Sex (M/F)	43/12	35/20	$\chi^2 = 2.82$	.09
Age, mean (SD), y	31.2 (9.4)	31.0 (9.8)	t = 0.059	.95
Age at onset of schizophrenia, mean (SD), y	21.0 (6.4)	22.0 (6.9)	t = −0.80	.43
Duration of schizophrenia, mean (SD), y	10.2 (3.4)	9.0 (5.4)	t = 1.57	.13
No. of hospitalizations	2.9 (1.5)	2.6 (1.4)	t = 1.29	.20
Marital status, N				
Married	5	4	$\chi^2 = 0.12$	.73
Divorced	6	13	$\chi^2 = 3.12$	.08
Single	44	38	$\chi^2 = 1.72$	.19
Education, N				
≤ 8th grade	6	5	$\chi^2 = 0.10$	.75
Grade 8–12	40	38	$\chi^2 = 0.18$	.67
College	9	12	$\chi^2 = 0.53$	.47
Work, N				
Full/partial	3	4	$\chi^2 = 0.15$	.70
Unemployed	52	51	$\chi^2 = 0.15$	.70
Type of schizophrenia, N				
Paranoid	36	39	$\chi^2 = 0.38$	.54
Disorganized	6	8	$\chi^2 = 0.33$	.57
Undifferentiated	13	8	$\chi^2 = 1.47$	.23
DDD, mean (SD)[a]				
Antipsychotics	2.6 (1.1)	1.4 (1.0)	t = 0.88	.38
Typical	1.4 (1.0)	1.3 (0.9)	t = 0.55	.58
Atypical	1.0 (0.5)	0.9 (0.4)	t = 1.16	.25
Antidepressants	1.3 (0.7)	1.3 (0.7)	t = 1.02	.31
Antiparkinsonian agents	0.7 (0.3)	0.5 (0.3)	t = 2.23	.03

[a]DDD = defined daily dosage as determined by the World Health Organization Collaborating Center for Drug Statistics.[26]

in schizophrenia patients with and without OCD has not yet been examined. These findings may provide additional support for a schizo-obsessive diagnostic entity.

We conducted a systematic phenomenological characterization of the largest sample to date (N = 55) of schizo-obsessive inpatients. We hypothesized that schizophrenia patients with and without OCD differ in the severity of schizophrenia symptoms. We also hypothesized that schizophrenia patients with OCD would have more OCD-related disorders compared to their non-OCD counterparts.

METHOD

Subjects (Table 1)

The study was conducted in Tirat Carmel Mental Health Center (Tirat Carmel, Israel) during the years 1996–1999. This psychiatric facility serves a catchment area in Northern Israel with a population of 300,000. Patients who were admitted due to acute psychosis and met DSM-IV criteria for both schizophrenia and OCD were recruited after resolution of the acute state, when they were capable of undergoing a structured clinical interview. Fifty-five of the 62 schizo-obsessive patients approached agreed to participate in the study. Patients with bipolar disorder, organic brain syndrome, or drug-induced psychoses were not included. The comparison group included 55 (of 67 approached) schizophrenia patients without OCD, matched for age (± 3 years) and number of hospitalizations, admitted to the same treatment facility during the same time period. In both groups, demographic and clinical characteristics were similar for those who agreed and those who refused to participate in the study. No abnormalities were noted on physical and neurologic examination or routine laboratory tests. The study was approved by the Institutional Review Board. All participants gave written informed consent after receiving a full explanation of the study protocol.

Clinical Assessments

Diagnosis of schizophrenia and lifetime OCD was based on the Structured Clinical Interview for DSM-IV Axis I disorders, Patient Edition (SCID-I/P).[19] Age at onset of schizophrenia (emergence of first psychotic symptoms), age at onset of OCD (first occurrence of clinically significant obsessions and/or compulsions), and the interval between the 2 were estimated using all information available from patients, medical records, and caregivers. OCD was defined as antecedent if obsessions and/or compulsions occurred at least 1 year prior to the onset of schizophrenia.

Severity and content of current OC symptoms were assessed using the Yale-Brown Obsessive-Compulsive Scale (YBOCS),[20] including the symptom checklist. We excluded all cases of subthreshold OCD as ascertained by the SCID-I/P and those with OC symptoms restricted to schizophrenia symptoms. Severity of schizophrenia symptoms was assessed with the Scales for the Assessment of Positive (SAPS)[21] and Negative Symptoms (SANS)[22] and the Clinical Global Impressions (CGI) scale for psychosis.[23] The negative dimension of schizophrenia was defined as the sum of the global ratings of alogia, anhedonia, avolition, and affective flattening (SANS); the positive dimension as the sum of the global ratings of delusions and hallucinations (SAPS); and the disorganized dimension as the sum of the global ratings of bizarre behavior, positive thought disorder (SAPS), and inappropriate affect (SANS).[22] The severity of depressive symptoms was assessed using the Hamilton Rating Scale for Depression (HAM-D)[24] and extrapyramidal side effects (EPS) with the Simpson-Angus Scale (SAS).[25]

Psychiatric comorbidity, as ascertained by the SCID-I/P, was defined as the presence of any additional

Table 2. Clinical Rating Scale Scores of Schizophrenia Patients With and Without Obsessive-Compulsive Disorder (OCD)

Variable	Schizophrenia With OCD (N = 55) Mean (SD)	Schizophrenia Without OCD (N = 55) Mean (SD)	t Statistic (df = 108)	p
SAPS				
Hallucinations	0.4 (0.9)	0.6 (1.2)	–1.44	.15
Delusions	2.1 (1.1)	2.6 (1.0)	2.63	.009[b]
Bizarre behavior	2.3 (0.9)	1.6 (1.3)	3.36	.001[a]
Formal thought disorder	2.0 (1.1)	2.6 (1.0)	2.86	.005[b]
SANS				
Affect	2.2 (1.0)	2.5 (1.1)	1.27	.21
Alogia	1.3 (1.1)	1.2 (1.3)	0.50	.62
Avolition	2.1 (1.1)	2.3 (1.0)	–0.82	.42
Anhedonia	2.6 (1.0)	2.9 (0.8)	–1.40	.16
Attention	1.8 (1.0)	2.2 (1.3)	–2.21	.03
HAM-D	7.9 (3.9)	6.9 (3.5)	1.34	.18
CGI	3.8 (0.6)	4.1 (1.0)	–2.03	.04
SAS	1.4 (0.6)	1.2 (0.9)	1.69	.09
SAPS\SANS				
Positive	2.4 (1.6)	3.2 (1.7)	–2.59	.01[a]
Negative	9.9 (4.0)	11 (4.6)	–1.29	.20
Disorganized	5.4 (2.1)	5.6 (3.0)	–0.26	.80
YBOCS				
Obsessions	10.5 (5.6)	0.3 (1.0)	9.72	.00[a]
Compulsions	10.9 (4.4)	0.2 (1.0)	17.59	.00[a]
Total	21.5 (7.9)	1.4 (0.5)	18.83	.00[a]

[a]Statistically significant at $\alpha = .05$, using the Bonferroni procedure. All tests significant according to the Bonferroni procedure are also significant according to False Discovery Rate.
[b]Statistically significant at $\alpha = .05$, using the False Discovery Rate procedure.
Abbreviations: CGI = Clinical Global Impressions scale for Psychosis, HAM-D = Hamilton Rating Scale for Depression, SANS = Scale for Assessment of Negative Symptoms, SAPS = Scale for Assessment of Positive Symptoms, SAS = Simpson-Angus Scale for extrapyramidal side effects, YBOCS = Yale-Brown Obsessive-Compulsive Scale.

lifetime or concurrent DSM-IV Axis-I psychiatric diagnosis. Patients were screened for alcohol and substance abuse, major depressive disorder (MDD), panic disorder, social phobia, simple phobia, and OCD-spectrum disorders (body dysmorphic disorder, hypochondriasis, anorexia nervosa, bulimia nervosa). Tourette's syndrome and chronic tic disorder were diagnosed using a specific module based on the DSM-IV criteria.

Dosages for all psychotropic drugs were converted to defined daily dosages (DDD) as determined by the World Health Organization (WHO) Collaborating Center for Drug Statistics.[26] This method was chosen since it covers antipsychotic and non-antipsychotic medications and combinations of drug classes.

The SCID-I/P and rating scales were administered by 2 trained residents in psychiatry (V.K. and G.W.) under the supervision of 2 senior investigators (M.P. and R.W.) experienced in both schizophrenia and OCD. Interrater reliability among the 4 raters was high for both primary diagnoses and comorbid diagnoses, as well as for the SAPS, SANS, CGI, and HAM-D (kappa = 0.75–0.89).

Statistical Analysis

Student t test and chi-square test were used as appropriate to compare demographic variables and rating scale scores between schizo-obsessive and non-OCD–schizophrenia patients. For multiple comparisons, the clinical rating scale scores were divided into 2 sets, one with 11 primary variables (SAPS [4 subscales], SANS [5 subscales], CGI, HAM-D) and one with 3 variables (SAPS/SANS positive, negative, disorganized dimensions, derived from the variables of the first set). The Bonferroni procedure for multiple comparisons (with $\alpha = .05$) was applied separately to the 2 sets of variables. Given the well-known conservativeness of the classical Bonferroni procedure, we used the complementary False Discovery Rate (FDR) procedure for multiple comparisons.[27] The classical procedure controls for the family-wise error rate, i.e., ensures that the probability that at least 1 null hypothesis will be falsely rejected will not exceed alpha. By contrast, the FDR ensures that the expected proportion of null hypotheses that are falsely rejected ("false discoveries") will not exceed the prespecified alpha value. All null hypotheses rejected by the Bonferroni procedure are also rejected by the FDR.

Pearson's correlation and regression analysis were used to assess the relationship between OC symptoms (YBOCS scores) and the 3 SAPS/SANS symptom dimensions as well as the relationship between the duration of illness and the schizophrenic and OC symptoms.

RESULTS

Schizophrenia Symptoms

Schizo-obsessive patients (N = 55) scored higher than schizophrenia patients without OCD (N = 55) on the SAPS bizarre behavior subscale (Table 2). According to FDR, the lower scores of the schizo-obsessive group on the SAPS delusions and formal thought disorder subscales were also statistically significant. Overall, the schizo-obsessive group scored significantly lower on the positive dimension (2.4 ± 1.6 vs. 3.2 ± 1.7, $t = 2.59$, $df = 108$, $p = .01$, significant after Bonferroni correction). There were no between-group differences in negative and disorganized dimensions, CGI, or HAM-D scores (Table 2).

The correlation analysis in the schizo-obsessive group showed a modest but significant positive correlation of duration of schizophrenia and SANS attention ($r = 0.32$, $p = .017$) and alogia ($r = 0.27$, $p = .045$) subscale scores, but not with the positive, negative, and disorganized dimensions, CGI, or HAM-D (from $r = –0.05$ to $r = –0.21$, all nonsignificant). A positive correlation of the compulsion subscale (YBOCS) and bizarre behavior (SAPS) ($r = 0.38$, $p = .004$) was also found.

Within the non-OCD–schizophrenia group, duration of illness was not associated with any rating scale scores (from $r = 0.00$ to $r = 0.25$, all nonsignificant).

Table 3. Comorbid Axis I Psychiatric Disorders in Schizophrenia Patients With and Without Obsessive-Compulsive Disorder (OCD)

Comorbid Diagnosis	Schizophrenia With OCD (N = 55) N[a]	%	Schizophrenia Without OCD (N = 55) N[a]	%	χ^2 Statistic	p
MDD	11	20.0	9	16.4	0.24	.62
Substance abuse	5	9.1	7	12.7	0.37	.54
Panic disorder	1	1.8	0	0	1.01	.32
Social phobia	4	7.3	1	1.8	1.89	.17
Specific phobia	3	5.5	2	3.6	0.21	.65
Hypochondriasis	2	3.6	0	0	1.04	.31
Anorexia nervosa	3	5.5	1	1.8	1.04	.31
Bulimia nervosa	1	1.8	1	1.8	0.00	1.00
BDD	4	7.3	0	0	4.15	.04[b]
Chronic tic disorder	4	7.3	0	0	4.15	.04[b]

[a]Some patients had more than 1 comorbid disorder.
[b]Nonsignificant following Bonferroni post-hoc test.
Abbreviations: BDD = body dysmorphic disorder, MDD = major depressive disorder.

OCD Symptoms in OCD-Schizophrenia

The majority of schizo-obsessive patients (40/55, 72.7%) had both obsessions and compulsions; 6 (10.9%) had only obsessions and 9 (16.4%) only compulsions. The mean ± SD number of obsessions and compulsions per patient was 3.8 ± 0.8. The most prevalent were aggressive and contamination obsessions, followed by somatic and sexual obsessions; the most prevalent compulsions were cleaning/washing, followed by counting, ordering/arranging, and hoarding.

OCD preceded the onset of schizophrenia in 26/55 patients (47.3%), appeared after schizophrenia symptoms in 15 patients (27.3%), and in 14 patients (25.5%) appeared simultaneously. The total YBOCS score of the schizo-obsessive group was 21.5 ± 7.9, obsessions score 10.5 ± 5.6, and compulsions score 10.9 ± 4.4. There was a positive correlation between duration of schizophrenia and YBOCS total ($r = 0.34$, $p = .012$) and compulsions ($r = 0.38$, $p = .004$), but not obsessions score ($r = 0.17$, $p = .21$). No correlation was found between positive, negative, or disorganized dimension scores and YBOCS obsessions, compulsions, or total scores ($r = 0.00$ to $r = 0.25$, all nonsignificant). Furthermore, no correlation was found between the YBOCS obsession subscale and the SAPS delusion item ($r = 0.15$, $p = .28$), indicating a lack of overlap between obsessions and delusions scores.

Two subgroups of schizo-obsessive patients were identified on the basis of the interrelationship between the OCD and schizophrenia symptoms. Subgroup I (25/55, 45.4%) had "classical" ego-dystonic obsessions and/or compulsions unrelated to the content of delusions and hallucinations (see Appendix 1, case 1). Subgroup II (30/55, 54.5%) included patients with both "classical" OC symptoms and OC symptoms related to delusional and/or hallucinatory content (see Appendix 1, case 2). OC symptoms predated the schizophrenia symptoms in more patients from subgroup I than subgroup II (16/25 vs. 10/30, $\chi^2 = 5.15$, $p = .023$). Noteworthy, according to chart reviews, the primary diagnosis of OCD preceded the diagnosis of schizophrenia in 14/25 patients (56%) in subgroup I and in only 5/30 patients (16.7%) in subgroup II. Significantly more patients from subgroup I received serotonin reuptake inhibitors (SRIs) in addition to ongoing antipsychotic treatment (52% vs. 13.3%; $\chi^2 = 9.55$, $p = .002$).

Comorbidity

Fifty-one (46.4%) of the entire patient sample met DSM-IV criteria for at least 1 lifetime or current comorbid disorder: 30/55 (54.5%) schizo-obsessive patients and 21/55 (38.2%) schizophrenia patients without OCD ($\chi^2 = 2.96$, $p = .08$). Eight schizo-obsessive patients (14.5%) and 3 schizophrenia patients without OCD (5.4%) had 2 or more comorbid disorders ($\chi^2 = 2.53$, $p = .11$).

MDD occurred with the highest frequency in both groups, followed by substance abuse (Table 3). No between-group differences were found in the frequency of comorbid anxiety disorders. Schizo-obsessive patients had more body dysmorphic disorder and chronic tic disorders; no between-group differences were found in the rate of hypochondriasis and eating disorders (Table 3). No cases of Tourette's syndrome were noted in either group. Overall, the schizo-obsessive group had more OCD-spectrum disorders (body dysmorphic disorder, hypochondriasis, eating disorders, chronic tic disorder) than the non-OCD–schizophrenia group (N = 14 [25.4%] vs. N = 2 [3.6%]; $\chi^2 = 8.19$, $p = .004$, significant after Bonferroni correction).

Pharmacologic Treatment

No between-group differences were found in the DDD of antipsychotics and antidepressants (see Table 1). More schizo-obsessive patients than non-OCD–schizophrenia patients were treated with clozapine (16/55 vs. 7/55, respectively; $\chi^2 = 4.45$, $df = 1$, $p = .04$) and with SRIs (clomipramine, fluoxetine, fluvoxamine) (17 vs. 7, $\chi^2 = 5.33$, $p = .02$). Eight patients (14.5%) in the schizo-obsessive group and 13 (23.6%) in the non-OCD–schizophrenia group were treated with antiparkinsonian agents for EPS, with higher doses for schizo-obsessive group (DDD: 0.7 ± 0.29 vs. 0.5 ± 0.29; $t = 2.17$, $df = 19$, $p = .03$). These patients scored 22% higher on the SAS (1.41 ± 0.58 vs. 1.16 ± 0.93; $t = 1.69$, $df = 19$, $p = .09$).

DISCUSSION

Our major finding is that schizo-obsessive patients differ substantially from their non-OCD–schizophrenia counterparts in severity of schizophrenia symptoms, rate of occurrence of OCD-spectrum disorders, and

pharmacotherapy. Moreover, we identified 2 subgroups of schizo-obsessive patients: OCD independent of schizophrenia symptoms and OCD with some symptoms overlapping positive symptoms.

Limitations of the present study should be acknowledged. First, although ours is the largest sample to date of schizo-obsessive patients, it is nonetheless too small for a definitive characterization of OC phenomena in schizophrenia and the rate of comorbidity of OCD-spectrum disorders. Second, the characterization of a putative schizo-obsessive diagnostic entity is further limited by our exclusion of patients with subthreshold OCD and with OC symptoms restricted to schizophrenia symptoms. Third, the study sample included only hospitalized patients, so the results cannot be generalized to outpatients and the community-based population. Fourth, SCID-I/P with an additional specific module for tic disorders was used to diagnose OCD-spectrum disorders. There are no data on other putative OCD-related disorders (e.g., trichotillomania or impulse control disorders).[18] Finally, the cross-sectional design and lack of follow-up with repeated assessments preclude clarification of the interrelationship between OC and schizophrenia symptoms throughout the course of the illness. Both schizophrenia and OCD symptoms are expected to change over the treatment period at different rates. Hence the relationship between schizophrenia and OCD symptoms may change depending on the timing of the assessment. This possible transient state-dependent relationship may limit the generalizability of our findings.

The strengths of the present study include the carefully matched control sample of non-OCD–schizophrenia patients. It is the first study to use the Structured Clinical Interview and DSM-IV criteria to diagnose comorbid Axis I disorders in schizo-obsessive patients.

Schizophrenia Symptoms in Schizo-Obsessive Patients

The total group of schizo-obsessive patients scored significantly lower on the SAPS positive dimension. The lower scores on the delusion, but not hallucination, domain account for this difference. Noteworthy, schizo-obsessive patients scored consistently higher on the SAPS bizarre behavior subscale. The revealed positive correlation of the YBOCS compulsion and the SAPS bizarre behavior subscales may account for this finding.

Lower severity of delusions and formal thought disorders (according to FDR) in the schizo-obsessive group may indicate a possible "moderating" effect of OC symptoms on the expression of some positive schizophrenic symptoms. This finding is consistent with some previous reports.[5,15] However, most studies show either no difference[6,9,10,15] or even more severe positive symptoms[16] in schizo-obsessive patients. The between-group difference in pharmacotherapy (more patients treated with clozapine in the schizo-obsessive group) may also account for the lower severity of some positive schizophrenia symptoms. Furthermore, it is of note that a substantial overlap between delusional and obsessive phenomena represents a significant diagnostic challenge. Patients with OCD may exhibit varying degrees of insight.[28] Poor insight has been found in a substantial proportion (10%–36%) of OCD patients.[7,29] Moreover, delusional transformation of obsessions has been described.[30,31] Alternatively, the concept of delusions as a complete loss of insight has been challenged by the demonstration of dimensions of delusions.[32,33] The term *recovering delusion*[34] was used to highlight the possibility of the patients' partial awareness of the falsity of the delusional idea. In the present study, the assessment of obsessions and delusions was conducted by the same raters using YBOCS and SAPS, respectively. The lack of independent rating of each phenomenon may introduce a potential classification bias. However, the lack of correlation between the scores of obsessions (YBOCS) and delusions (SAPS) suggests that this was not the case in the present study. Noteworthy, Eisen et al.[3] suggested that the diagnosis of OCD comorbidity in schizophrenia patients should be based on the presence of compulsions that seemed to be a phenomenon that is less delusion-dependent. The complex relationship between obsessions, compulsions, and delusions in schizophrenia-associated OCD merits further longitudinal large-scale studies.

The OCD-, but not non-OCD–, schizophrenia group showed significant positive correlations between duration of schizophrenia and the SANS alogia and attention subscales. This correlation together with the association of a longer duration of schizophrenia with increased severity of OC symptoms raises the possibility of increased severity of negative symptoms and poorer outcome in schizo-obsessive patients. Consistently, more severe negative symptomatology has been observed in chronic schizophrenia patients with OCD.[2,9,16] Since negative, but not positive, symptoms are associated with a greater likelihood of cognitive impairment and poor clinical outcome,[35] it is not surprising that schizo-obsessive patients are generally characterized by poorer prognosis.[2,6,8,9] A prospective evaluation of the effect of OCD on positive/negative symptoms in independent samples is warranted.

OC Symptoms in Schizophrenia

The majority of our schizo-obsessive patients had moderate-to-severe multiple OC symptoms. This is in agreement with the clinical characterization of OCD patients without schizophrenia.[7] There was substantial similarity between the types, frequencies, and content of the obsessions and compulsions in our sample and those found in previous studies of OCD with or without schizophrenia.[4,6,7] This finding and the lack of correlation between the severity of OC and schizophrenia symptoms confirm that OC symptoms in schizophrenia with OCD

are distinct and distinguishable from core schizophrenia symptoms.[8]

Our psychopathologic analysis of OC symptoms yielded 2 subgroups: OCD unrelated to schizophrenia symptoms and OCD related but not exclusively restricted to schizophrenia symptoms. Porto et al.[4] also described a third subset of patients who met OCD criteria, but the content of OC symptoms was limited to delusions and/or hallucinations. When mild and subsyndromal forms of OCD were also taken into account,[4] psychopathologic complexity of OC phenomena in schizophrenia emerged. Given the diagnostic pitfalls in the discrimination between obsessions and delusions, we suggest that, until more studies on the nature and cause of OC phenomena in schizophrenia are available, diagnosis of OCD-schizophrenia should be confined only to those patients who meet full DSM-IV criteria of both OCD and schizophrenia.

Comorbidity

Lifetime and current Axis I comorbid psychiatric disorders were found in 46.7% of our entire sample of schizophrenia patients, which is consistent with findings in other samples with similar clinical characteristics.[36] Our hypothesis that schizo-obsessive patients have a higher rate of OCD-spectrum disorders than non-OCD–schizophrenia patients was supported by these findings. The between-group difference was explained mainly by the contribution of body dysmorphic disorder and chronic motor tics. Considerable overlap has been described in clinical symptoms, family history, basal ganglia dysfunction, and response to pharmacotherapy between these disorders and OCD.[37] Thus, it is plausible that a common pathophysiologic mechanism underlying OCD, tic disorder, and body dysmorphic disorder may account for the higher rate of these comorbidities in the schizo-obsessive subgroup. The higher rate of OCD-spectrum disorders in the schizo-obsessive group further supports the distinction between OCD-schizophrenia and non-OCD–schizophrenia.

Pharmacotherapy

Clozapine was prescribed more frequently for schizo-obsessive than for non-OCD–schizophrenia patients. Atypical antipsychotics, primarily clozapine, were associated with occurrence or exacerbation of OC symptoms in schizophrenia patients.[38] It seems unlikely that this explains our findings, as all clozapine-treated patients were diagnosed for OCD prior to clozapine initiation. We suggest that schizo-obsessive patients were more treatment resistant, which supports the finding that schizo-obsessive subgroup is a difficult-to-treat subcategory of schizophrenia.[10–12]

Serotonin reuptake inhibitors were prescribed more frequently for patients with OC symptoms independent of schizophrenia (subgroup I), which may reflect the tendency to add SRIs to ongoing neuroleptic treatment in a naturalistic setting when OCD can be clinically distinguished from schizophrenia symptoms. Alternatively, it is possible that clinicians tend to avoid the use of SRIs when some of the OCD symptoms are schizophrenia-related (subgroup II) on the assumption that monotherapy with antipsychotics is sufficient to achieve clinical improvement also in the OCD dimension.[39]

The schizo-obsessive group received significantly higher doses of antiparkinsonian agents, but nevertheless showed a trend toward more severe EPS. Accordingly, several studies reported more severe akathisia, abnormal involuntary movements, and parkinsonism[15,17] in patients with OCD-schizophrenia than non-OCD–schizophrenia. On the basis of the apparent involvement of the basal ganglia in both schizophrenia and OCD, patients with schizophrenia and OCD may have a greater propensity to basal ganglia dysfunction and drug-induced EPS than patients with non-OCD–schizophrenia.

Clinical Implications and Future Directions

Our findings highlight the importance of targeting OC symptoms in schizophrenia patients. The delineation of 2 subgroups of OCD-schizophrenia may further facilitate the identification of complex OC phenomena in schizophrenia. The high rate of OCD-spectrum disorders in schizo-obsessive patients indicates that a comprehensive evaluation should include a systematic search for and assessment of these comorbidities. The differences found in the preferential pharmacologic treatment in the clinical setting of schizo-obsessive patients should prompt further controlled studies comparing the efficacy and tolerability of atypical antipsychotic agents given alone or in combination with antiobsessive medications in this difficult-to-treat subset of patients. To further validate the specificity of an OCD-schizophrenia entity, family, neuroimaging, pharmacologic, and prospective follow-up longitudinal studies are warranted. Finally, comprehensive phenotyping of homogeneous schizo-obsessive subgroup(s) may eventually lead to the detection of common and unique environmental and genetic contributors to OCD-schizophrenia and non-OCD–schizophrenia.

Drug names: clomipramine (Anafranil and others), clozapine (Clozaril and others), fluoxetine (Prozac and others).

Disclosure of off-label usage: The authors of this article have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

REFERENCES

1. Bermanzohn PC, Porto L, Arlow PB, et al. Hierarchical diagnosis in chronic schizophrenia: a clinical study of co-occurring syndromes.

Schizophr Bull 2002;26:517–525
2. Fenton WS, McGlashan TH. The prognostic significance of obsessive-compulsive symptoms in schizophrenia. Am J Psychiatry 1986;143:437–441
3. Eisen JL, Beer DA, Pato MT, et al. Obsessive-compulsive disorder in patients with schizophrenia and schizoaffective disorder. Am J Psychiatry 1997;154:271–273
4. Porto L, Bermanzohn PC, Pollack S, et al. A profile of obsessive-compulsive symptoms in schizophrenia. CNS Spectr 1997;2:21–25
5. Poyurovsky M, Fuchs K, Weizman A. Obsessive-compulsive symptoms in patients with first episode schizophrenia. Am J Psychiatry 1999;156:1998–2000
6. Poyurovsky M, Hromnikov S, Isakov V, et al. Obsessive-compulsive disorder in chronic institutionalized schizophrenic patients. Psychiatry Res 2001;102:49–57
7. Foa EB, Kozak MJ. DSM-IV field trial: obsessive-compulsive disorder. Am J Psychiatry 1995;152:90–96
8. Berman I, Kalinowski A, Berman S, et al. Obsessive-compulsive symptoms in chronic schizophrenia. Compr Psychiatry 1995;36:6–10
9. Hwang MY, Morgan JE, Losconzcy MF. Clinical and neuropsychological profiles of obsessive-compulsive schizophrenia: a pilot study. J Neuropsychiatry Clin Neurosci 2000;12:91–104
10. Berman I, Merson A, Viegner B, et al. Obsessions and compulsions as a distinct cluster of symptoms in schizophrenia: a neuropsychological study. J Nerv Ment Dis 1998;186:150–156
11. Poyurovsky M, Isakov V, Hromnikov S, et al. Fluvoxamine treatment of obsessive-compulsive symptoms in schizophrenic patients: an add-on open study. Int Clin Psychopharmacol 1999;14:95–100
12. Zohar J, Kaplan Z, Benjamin J. Clomipramine treatment of obsessive compulsive symptomatology in schizophrenic patients. J Clin Psychiatry 1993;54:385–388
13. Berman I, Sapers BL, Chang HHJ, et al. Treatment of obsessive-compulsive symptoms in schizophrenic patients with clomipramine. J Clin Psychopharmacol 1995;15:206–210
14. Bermanzohn PC, Porto L, Arlow PB, et al. Are some neuroleptic-refractory symptoms of schizophrenia really obsessions? CNS Spectr 1997;2:51–57
15. Kruger S, Braunig P, Hoffler J, et al. Prevalence of obsessive-compulsive disorder in schizophrenia and significance of motor symptoms. J Neuropsychiatry Clin Neurosci 2000;12:16–24
16. Lysaker PH, Marks KA, Picone JB, et al. Obsessive and compulsive symptoms in schizophrenia: clinical and neurocognitive correlates. J Nerv Ment Dis 2000;188:78–83
17. Tibbo P, Kroetsch M, Chue P, et al. Obsessive-compulsive disorder in schizophrenia. J Psychiatr Res 2000;34:139–146
18. Hollander E, Wong CM. Introduction: obsessive-compulsive spectrum disorders. J Clin Psychiatry 1995;56(suppl 4):3–6; discussion 53–55
19. First MB, Spitzer RL, Gibbon M, et al. Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (SCID-I/P, version 2.0). New York, NY: Biometric Research, New York State Psychiatric Institute; 1995
20. Goodman WK, Price LH, Rasmussen SA, et al. The Yale-Brown Obsessive-Compulsive Scale, 1: development, use, and reliability. Arch Gen Psychiatry 1989;46:1006–1011
21. Andreasen NC. The Scale for the Assessment of Positive Symptoms in Schizophrenia. Iowa City, Ia: University of Iowa; 1984
22. Andreasen NC. The Scale for the Assessment of Negative Symptoms in Schizophrenia. Iowa City, Ia: University of Iowa; 1983
23. Guy W. ECDEU Assessment Manual for Psychopharmacology, Revised. US Dept Health, Education, and Welfare publication (ADM) 76-338. Rockville, Md: National Institute of Mental Health; 1976:534–537
24. Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry 1960;23:56–62
25. Simpson GM, Angus JWS. A rating scale for extrapyramidal side effects. Acta Psychiatr Scand 1970;212(suppl):11–19
26. World Health Organization Collaborating Center for Drug Statistics. Guidelines for ATC Classification and DDD Assignment. Oslo, Norway: WHO Collaborating Center for Drug Statistics; 2000
27. Benjamini Y, Hochberg Y. Controlling the false discovery rate: a practical and powerful approach to multiple testing. J Roy Stat Soc B 1995;57:289–300
28. Eisen JL, Rasmussen SA. Obsessive compulsive disorder with psychotic features. J Clin Psychiatry 1993;54:373–379
29. Matsunaga H, Kiriike N, Matsui T, et al. Obsessive-compulsive disorder with poor insight. Compr Psychiatry 2002;43:150–157
30. Gordon A. Transition of obsessions into delusions. Am J Psychiatry 1950;107:455–458
31. Insel TR, Akiskal HS. OCD with psychotic features: a phenomenological analysis. Am J Psychiatry 1986;143:1527–1533
32. Kendler K, Glazer WM, Morgenstern H. Dimensions of delusional experience. Am J Psychiatry 1983;140:466–469
33. Appelbaum PS, Robbins PC, Roth LH. Dimensional approach to delusions: comparison across types and diagnoses. Am J Psychiatry 1999;156:1938–1943
34. Spitzer M. On defining delusions. Compr Psychiatry 1990;31:377–397
35. Tamminga CA, Buchanan RW, Gold JM. The role of negative symptoms and cognitive dysfunction in schizophrenia outcome. Int Clin Psychopharmacol 1998;13(suppl 3):S21–S26
36. Strakowski SM, Tohen M, Stoll AL, et al. Co-morbidity in psychosis at first hospitalization. Am J Psychiatry 1993;150:752–757
37. Allen A, Hollander A. Body dysmorphic disorder. Psychiatr Clin North Am 2000;23:617–628
38. Poyurovsky M, Hermesh H, Weizman A. Fluvoxamine treatment in clozapine-induced obsessive-compulsive symptoms in schizophrenia symptoms. Clin Neuropharmacol 1996;19:305–313
39. Poyurovsky M, Dorfman-Etrog P, Hermesh H, et al. Beneficial effect of olanzapine in schizophrenic patients with obsessive-compulsive symptoms. Int Clin Psychopharmacol 2000;15:169–173

Appendix 1 appears on page 1307.
For the CME Posttest for this article, see pages 1400–1402.

Appendix 1: Representative Case Reports

Case 1: Symptoms of OCD Independent of Symptoms of Schizophrenia

A 24-year-old unmarried man was admitted to a psychiatric hospital for a first acute psychotic episode characterized by delusions of persecution, auditory hallucinations, and bizarre behavior. Eight months earlier, the patient had complained that his neighbors were watching him and were trying to hypnotize him. He also heard voices "making fun of him." These psychotic symptoms were associated with a substantial social decline and functional impairment. A DSM-IV diagnosis of schizophrenic disorder, paranoid type, was established. According to both the patient and his parents, since age 15, he had constantly worried that he would hurt his parents, and, to neutralize these thoughts, he touched his nose repeatedly. He also had an irresistible urge to count steps while walking and to keep all school belongings in symmetry. He recognized that his worries and rituals were excessive and unreasonable. At age 18, OCD was diagnosed. His OCD symptoms were unnoticed during the current psychotic episode owing to the severe and pervasive nature of the paranoid delusions, but became detectable after resolution of psychosis.

Case 2: OCD With Some Symptoms Overlapping With Positive Schizophrenia Symptoms

A 50-year-old single woman had an 18-year history of DSM-IV schizophrenic disorder, paranoid type, characterized by delusions of persecution, auditory hallucinations, and formal thought disorders. Negative symptoms included flat affect and significant decline in social interests. At age 35, 3 years after her first schizophrenic episode, she complained of intrusive, distressful, and time-consuming thoughts that she was cursing God. She was convinced that other people knew about these thoughts and were able to "read her mind." She had a constant need for reassurance and repeatedly asked others if she deserved punishment. In addition, the patient had typical compulsions (repeated checking of electrical appliances and counting floor tiles) unrelated to schizophrenia symptoms. She was aware of the unreasonable nature of these acts but was unable to resist performing them. The obsessive thoughts of cursing God were exacerbated during psychotic episodes and diminished in remission, when she gained partial insight into their intrusive nature. By contrast, her compulsive non–schizophrenia-related behavior did not surface during acute psychotic episodes, but became prominent during remission.