Clinical Features Distinguishing Patients With Tourette's Syndrome and Obsessive-Compulsive Disorder From Patients With Obsessive-Compulsive Disorder Without Tics

Tanya Petter; Margaret A. Richter, M.D., F.R.C.P.C.; and Paul Sandor, M.D., F.R.C.P.C.

Objective: It is not clear whether obsessive-compulsive disorder (OCD) in the context of Tourette's syndrome (TS) is the same as that disorder found in patients with OCD alone. This study evaluated the severity and characteristics of the obsessive-compulsive symptoms in adult patients with OCD and TS compared to adult patients with OCD alone.

Method: Thirteen subjects with both DSM-III-R TS and OCD and 13 subjects with OCD alone were recruited. Obsessive-compulsive severity was determined by using the Yale-Brown Obsessive Compulsive Scale. The Tourette Syndrome Association Unified Tic Rating Scale was administered to determine tic severity, and the adult version of the Attention Deficit and Hyperactivity Checklist was used to detect a history of childhood attention-deficit hyperactivity disorder (ADHD).

Results: Subjects with OCD alone had very few obsessions and compulsions that were not also experienced by subjects with both TS and OCD. In contrast, subjects with TS and OCD were significantly more likely to report obsessions involving nonviolent images, excessive concern with appearance, and need for symmetry. Touching, blinking or staring, and counting compulsions were also significantly more common in this group. Eight subjects with OCD and TS had a childhood history of ADHD, compared to none of the pure OCD subjects.

Conclusion: There are subtle but definite differences in symptomatology of subjects with pure OCD compared to those with OCD and TS consistent with putative differences in pathophysiology between the 2 groups, i.e., abnormalities in the serotonergic system in OCD patients and serotonergic and dopaminergic abnormalities in those with OCD and TS. These observations may be consistent with genetic heterogeneity within both OCD and TS.

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Received March 5, 1996; accepted Jan. 12, 1998. From the Tourette's Syndrome Clinic, Department of Psychiatry, The Toronto Hospital (Ms. Petter and Dr. Sandor), the Anxiety Disorders Clinic, Clarke Institute of Psychiatry (Dr. Richter), and the University of Toronto (all authors), Toronto, Canada.

Reprint requests to: Paul Sandor, M.D., Tourette's Syndrome Clinic, ECW 3D-047, The Toronto Hospital, 399 Bathurst St., Toronto, Ontario, Canada, M5T 2S8.

The increased frequency of obsessive-compulsive symptoms among patients with Tourette's syndrome (TS) has been well documented.[1,2] Family studies of probands with TS show an increased incidence of obsessive-compulsive disorder (OCD) among first-degree relatives. Similarly, studies of probands with OCD show an increased incidence of first-degree relatives with TS and related tic disorders.[3,4] A recent follow-up study found that 56% of children with OCD had tics and that 14% developed TS during the 2- to 5-year follow up.[5] Such observations suggest that there may be a common genetic etiology for the 2 disorders in at least a subset of patients who have both TS and OCD.[4,6] It has not yet been determined whether OCD in the context of TS is the same disorder as that found in OCD patients with no personal or family history of tic disorders.

One approach to this question is to investigate the clinical features of obsessive-compulsive phenomena in these 2 populations in greater detail. Such an approach was recently taken by George et al.,[7] who reported several phenomenological differences in obsessions and compulsions found in OCD alone versus OCD in the context of TS. They found striking differences in frequency of several symptoms despite the fact that only 10 OCD and 15 TS with OCD subjects were studied. One weakness of this study was the inclusion of 2 subjects with tics in the group of "pure" OCD patients. Secondly, there was no mention of whether or not there was any family history of tic disorders in the pure OCD group.

If confirmed, such findings would be consistent with the suggestion that pure OCD and OCD in the context of TS are the result of somewhat different etiologic mechanisms leading to differences in clinical presentation. We

Table 1. Data on Subjects With Pure Obsessive-Compulsive Disorder (Pure OCD) and Subjects With Comorbid Tourette's Syndrome and Obsessive-Compulsive Disorder (TS + OCD)

	Age (y)		Sex		Y-BOCS Score		Y-BOCS Severity	
Group	Mean	SD	Female	Male	Mean	SD	Mean	SD
Pure OCD (N = 13)	32.2	13.2	5	8	21.5	6.0	2.8	1.2
TS + OCD (N = 13)	29.8	10.0	9	4	18.6	5.4	2.2	0.9

Table 2. Family History of Tic Disorder, OCD, and Attention-Deficit Hyperactivity Disorder

Group	Tic Disorder	OCD/OCB[a]	ADHD
TS + OCD (N = 13)	11/13	6/13	1/13
Pure OCD (N = 13)	0/13	5/13	0/13

[a]OCB = obsessive-compulsive behavior that does not meet diagnostic criteria for OCD.

employed a stricter definition of "pure" OCD and a different method of statistical analysis to compare the 2 groups. Our results are similar to those reported by George et al.[7]

METHOD

For our purposes, OCD was considered "pure" if there was no personal or family history of TS or any tic disorders. To be considered for the study, the subjects were required to meet DSM-III-R criteria for OCD and/or TS as determined during a comprehensive assessment by an experienced clinician (P.S. or M.A.R.). They must have been at least 16 years old; had a good command of the English language; and been willing and able to cooperate with the research protocol, as evidenced by understanding and signing the consent form provided. Exclusionary criteria included the presence of mental retardation, seizure disorder, history of head trauma leading to loss of consciousness, history of drug or alcohol abuse, or the presence of depression or other significant psychiatric illness other than OCD or TS. None of the patients in our study were exposed to stimulant medication before the onset of the tics. The study was approved by the University of Toronto Review Committee on the Use of Human Subjects. After informed consent was obtained, a number of questionnaires were administered, including the Yale-Brown Obsessive Compulsive Scale[8] and the adult version of the Attention Deficit and Hyperactivity Checklist.[9] All ratings were carried out by the same rater (T.P.)

This study was designed to provide descriptive information; therefore, primarily descriptive statistics were used to analyze the data. Continuous variables such as age and the total scores on the Yale-Brown Obsessive Compulsive Scale were compared using 2-tailed Student t tests. Significance of difference among categorical variables such as the frequency of each obsessive-compulsive symptom in the 2 groups was calculated by Fisher exact test.

RESULTS

Thirteen subjects with pure OCD and 2 subjects with OCD and TS were recruited from the Anxiety Disorders Clinic at the Clarke Institute of Psychiatry; 11 subjects with TS and OCD were recruited from the TS Clinic at the Western Division of The Toronto Hospital. In addition, we recruited 4 subjects with OCD with a family history, but no personal history, of chronic motor tics, also from the Clarke Institute. Due to the small size of this group, no statistical analysis was possible, and these subjects were excluded from analysis.

There was no statistically significant age difference between the 2 study groups (Table 1). The 2 groups did not differ significantly in severity of OCD as indicated by total scores on the Yale-Brown Obsessive Compulsive Scale (Table 1). The frequency of family history of OCD and attention-deficit hyperactivity disorder (ADHD) was essentially the same in the 2 study groups (Table 2).

In administering the Yale-Brown Obsessive Compulsive Scale symptom checklist, we first asked the subjects to indicate whether or not they had ever experienced each of the items on the list, then to identify the 3 principal obsessions and compulsions to generate a target symptoms list. Only the symptoms that were present with significantly different frequency in the 2 groups are listed in Tables 3 and 4.

Considering the total list of obsessions and compulsions, both past and present, the only compulsion that was significantly more common in the pure OCD group was the compulsion to check that they did not or will not harm others (Table 3). In contrast, there were several obsessions and compulsions that occurred to a significantly greater extent in the group with TS and OCD. This group had more compulsions involving the need to touch, tap, or rub and rituals involving blinking or staring.

In the list of the 3 most prominent obsessions and compulsions for each patient, obsessions involving fear of harming others because of not being careful enough as well as hoarding and collecting compulsions were exclusive to the pure OCD group (Table 4). The group with OCD and TS reported significantly more obsessions with the need for symmetry or exactness not accompanied by magical thinking, intrusive nonviolent images, and more counting compulsions. The data gathered on the group with OCD and family history of tics suggest no obvious trends resembling either of the 2 study groups.

Notably, the number of subjects reporting symptoms of ADHD in childhood differed significantly between the 2 study groups. While 62% (8/13) of those in the OCD and TS group would have qualified for the disorder using DSM-III-R criteria, none (0/13) of the pure OCD subjects did.

Table 3. All Past and Present Obsessions and Compulsions From the Yale-Brown Obsessive Compulsive Scale Checklist That Are Significantly Overrepresented in 1 of the Diagnostic Groups

Symptom	Pure OCD (N = 13) N	Pure OCD (N = 13) %	TS + OCD (N = 13) N	TS + OCD (N = 13) %	Exact Test (1-tailed) p Value
More common in pure OCD					
Obsessions	0	0	0	0	
Compulsions					
1. checking that did not/will not harm others	7	54	2	15	.048
More common in TS + OCD					
Obsessions					
1. intrusive nonviolent images	5	38	12	92	.006
2. excessive concern with body part or aspect of appearance	0	0	6	46	.007
3. need for symmetry not accompanied by magical thinking	2	15	8	62	.021
4. need to know or remember	5	38	11	85	.027
5. sexual behavior toward others	0	0	4	31	.048
6. bothered by sticky substances or residues	2	15	7	54	.048
7. intrusive nonsense sounds, words, or music	2	15	7	54	.048
8. bothered by certain sounds/noises	2	15	7	54	.048
Compulsions					
1. need to touch, tap, or rub	3	23	11	85	.002
2. rituals involving blinking or staring	4	31	10	77	.024

Table 4. Three Principal Obsessions and Compulsions From the Yale-Brown Obsessive Compulsive Scale Checklist That Are Significantly Overrepresented in 1 of the Diagnostic Groups

Symptom	Pure OCD (N = 13) N	Pure OCD (N = 13) %	TS + OCD (N = 13) N	TS + OCD (N = 13) %	Exact Test (1-tailed) p Value
More common in pure OCD					
Obsessions					
1. fear will harm others because not careful enough	4	31	0	0	.048
Compulsions					
1. hoarding/collecting	4	31	0	0	.048
More common in TS + OCD					
Obsessions					
1. need for symmetry not accompanied by magical thinking	0	0	4	31	.048
2. intrusive nonviolent images	1	8	6	46	.037
Compulsions					
1. counting	0	0	5	38	.020

DISCUSSION

Despite the relatively small number of subjects in each of the study groups, significant differences were noted between patients with pure OCD and those with TS and OCD. Consistent with previous reports, we found that several obsessions and compulsions were statistically more common in the group of subjects with TS and OCD. These included obsessions concerned with the need for symmetry and intrusive sexual thoughts, as well as touching compulsions, rituals involving blinking or staring, and counting compulsions. Similar results were recently reported in a larger sample by Holzer et al.[10] who compared 35 OCD patients with lifetime history of tics and 35 age- and sex-matched OCD patients without personal history of tics. There are many similarities in the clinical presentation of the obsessive-compulsive component of comorbid TS and OCD when compared with pure OCD. However, there are definite differences that are consistent with the early reports.[7,10]

The classification of the group of 4 patients with OCD and a family history of tics or TS requires a comment. Although intuitively the subjects in this group would be expected to resemble those with TS and OCD, we could detect no trends, likely due to the very small sample size. A larger study would be required to answer this question.

We also report a novel observation that the presence of a childhood history of ADHD in patients with OCD is strongly associated with the presence of comorbid TS in the same patients. None of our patients with pure OCD had a childhood history of ADHD. Such a distinction, if confirmed, would be of interest considering the evidence that ADHD is present in approximately 50% of a TS clinical population.[11] There is continuing controversy regarding the nature of this association. It has been argued that ADHD is an alternative phenotypic expression of the genetic vulnerability to TS[12,13] or, on the other hand, that it may be a result of ascertainment bias[14] or family stress.[15] Our patients with pure OCD were recruited from a tertiary, specialized clinic and presented with a significant degree of pathology compared with that of TS patients with OCD. Thus, it is unlikely that ascertainment bias or psychosocial stressors can explain the presence of ADHD among TS patients and not among pure OCD patients.

Caution must be used in interpreting our observations because the sample was drawn from 2 specialized clinics providing tertiary care. As such, these clinics tend to attract more complex cases with multiple problems. Moreover, the nonrandom nature of the sampling procedure may have introduced further bias. If such an association can be demonstrated in larger samples, the presence of a history of ADHD in patients with OCD may come to be regarded as a clinical marker of comorbid OCD with TS.

We conclude that OCD symptoms found in patients with TS as a group are similar to, but distinguishable from, those seen in patients with pure OCD. Such distinc-

tions cannot be made on an individual basis because of overlap in the clinical presentation of OCD symptoms in these 2 groups. Nevertheless, the group differences may indicate differences in brain neurochemistry between these 2 groups. These observations are also consistent with the hypothesis that both OCD and TS may be genetically heterogeneous, i.e., that there are different genetic types of OCD and perhaps also TS. Further work is required to explore the comorbidity of OCD and ADHD in patients with and without tic disorder.

Authors' Note: During the publishing process, 2 papers appeared reporting findings similar to ours in a mixed sample of children and adults[16] and adolescents.[17] Furthermore, Miguel et al.[18] reported that OCD patients experience primarily cognitive and autonomic phenomena preceding repetitive behaviors, while patients with TS or TS and OCD report more sensory phenomena and fewer cognitions than the OCD group.

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