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Personality disorders and depression

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ABSTRACT

Background. Personality disorders (PDs) were assessed among depressed out-patients by clinical interview before and after antidepressant treatment with fluoxetine to assess the degree of stability of PD diagnoses and determine whether changes in PD diagnoses across treatment are related to the degree of improvement in depressive symptoms.

Method. Three hundred and eighty-four out-patients (55% women; mean age = 39·9 ± 10·5) with major depressive disorder (MDD) diagnosed with the SCID-P were enrolled into an 8 week trial of open treatment with fluoxetine 20 mg/day. The SCID-II was administered to diagnose PDs at baseline and endpoint.

Results. A significant proportion (64%) of our depressed out-patients met criteria for at least one co-morbid personality disorder. Following 8 weeks of fluoxetine treatment, there was a significant reduction in the proportion of patients meeting criteria for avoidant, dependent, passive-aggressive, paranoid and narcissistic PDs. From baseline to endpoint, there was also a significant reduction in the mean number of criteria met for paranoid, schizotypal, narcissistic, borderline, avoidant, dependent, obsessive–compulsive, passive aggressive and self-defeating personality disorders. While changes in cluster diagnoses were not significantly related to improvement in depressive symptoms, there were significant relationships between degree of reduction in depressive symptoms (percentage change in HAM-D-17 scores) and degree of change in the number of criteria met for paranoid, narcissistic, borderline and dependent personality disorders.

Conclusions. Personality disorder diagnoses were found to be common among untreated out-patients with major depressive disorder. A significant proportion of these patients no longer met criteria for personality disorders following antidepressant treatment, and changes in personality disorder traits were significantly related to degree of improvement in depressive symptoms in some but not all personality disorders. These findings suggest that the lack of stability of PD diagnoses among patients with current MDD may be attributable in part to a direct effect of antidepressant treatment on behaviours and attitudes that comprise PDs.

INTRODUCTION

Personality disorders appear to be highly prevalent among individuals with major mood disorders (Joffe & Regan, 1988; Loranger *et al.* 1991). However, researchers have raised the issue that diagnosing personality disorders in patients with active Axis I disorders may be confounded by the particular state of the patient (Zimmerman, 1994). Thus, Hirschfeld and colleagues (1983) found that the clinically depressed state strongly influenced assessment of emotional strength, interpersonal dependency and extraversion. Furthermore, Joffe & Regan (1988) assessed personality disorder diagnoses measured by the self-rated Millon Clinical Multiaxial Inventory (MCMI), before and after depression treatment with tricyclic antidepressants, tri-

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cyclics augmented with lithium or thyroid, or monoamine oxidase inhibitors. They found that the prevalence of personality diagnoses of schizoid, avoidant, dependent, passive-aggressive, schizotypal and borderline personality disorder significantly decreased when the depression remitted while significant increases in trait scores were noted on the histrionic, narcissistic, antisocial and compulsive personality scales (Joffe & Regan, 1988). In a previous study, we also found that out-patients diagnosed with major depression exhibited significant decreases in the number of personality traits as assessed by the self-rated Personality Diagnostic Questionnaire-Revised (PDQ-R) after fluoxetine treatment (Fava *et al*. 1994). Similarly, Blais and colleagues (1998) found that of the 13 MCMI-II personality scales, four (avoidant, histrionic, aggressive-sadistic and schizotypal) showed significant reductions pre- and post-ECT treatment for depression.

Zimmerman *et al*. (1991) also described high rates of personality disorders among depressed patients using both clinical interviews and patient-rated instruments, but suggested that interview assessments of personality may be less sensitive to the state effects of depression than self-rated questionnaires. Similarly, Loranger *et al*. (1991) have argued that anxiety and depression do not impact personality assessments when clinical interviews are used. As part of their study, they administered a clinical interview (Personality Disorder Examination) to 84 patients at the time of hospital admission and then again within 6 months of patients' initial interview. They found no evidence that anxiety or depression had affected either the diagnosis of a personality disorder or the criteria associated with most of the individual personality disorders. Unfortunately, the mean Hamilton Depression Rating Scale score at entry was only $11{\cdot}1 \pm 7{\cdot}9$, suggesting that the severity of depression was rather low on average and $7{\cdot}0 \pm 7{\cdot}4$ at follow-up, indicating that the mean degree of change in depression was small (Loranger *et al*. 1991). In addition, 34 (40%) of the 84 patients were reassessed within 1 month of study entry, perhaps not allowing adequate time for treatment to result in changes in personality traits.

Evidence suggesting that antidepressants may actually be helpful in the treatment of personality disorders adds to the complexity of the study of the relationship between personality disorder diagnoses and depression (Gitlin, 1993; Stein, 1992; Fava, 1997; Kapfhammer & Hippius, 1998). For example, regardless of change in depression, Salzman and colleagues (1995) found that fluoxetine treatment reduced anger in patients diagnosed with borderline personality disorder, and Coccaro & Kavoussi (1997) showed significant reductions in impulsive aggression in non-depressed personality disordered patients. These findings suggest that changes in personality disorder traits and/or diagnoses observed in depressed patients following antidepressant treatment may be related not only to changes in depression severity, but also to effects of these same drugs on attributes of the personality disorders themselves.

In light of the previously mentioned concerns that the use of self-rated personality disorder scales may be relatively confounded by the severity of depressive symptoms, we assessed both personality disorders and personality traits with a clinical interview, the Structured Clinical Interview for DSM-III-R, Personality Disorders (SCID-II) (Spitzer *et al*. 1990), before and after antidepressant treatment with fluoxetine. The SCID-II is a clinician-rated instrument that is relatively less sensitive but more specific than the self-rated PDQ-R (Fava *et al*. 1994). While we assessed personality disorders with a categorical approach (e.g. meeting or not meeting criteria for a specific personality disorder), we also assessed personality disorder traits with a more quantitative, dimensional approach (e.g. evaluating the number of criteria met within each diagnostic category of personality disorders). We also wanted to evaluate whether possible changes in personality disorder diagnoses/traits would be accounted for by the degree of improvement in depressive symptoms. Finally, we wished to evaluate whether changes in PD diagnoses would be predicted by clinical characteristics, particularly co-morbid anxiety disorders or anger attacks, which may also improve following treatment with fluoxetine (Fava *et al*. 1991).

METHOD

Our initial sample was drawn from 384 (55% female) out-patients between the ages of 18 and 65 (mean age = $39{\cdot}9 \pm 10{\cdot}5$) who were enrolled

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in an 8-week open treatment trial of fluoxetine 20 mg/day at the Depression Clinical and Research Program of the Massachusetts General Hospital. At baseline, these out-patients were required to meet criteria for MDD diagnosed with the Structured Clinical Interview for DSM-III-R Patient Edition (SCID-P) (Spitzer *et al.* 1989). Patients were also required to have a 17-item Hamilton Rating Scale for Depression (HAM-D-17) (Hamilton, 1960) score $\geqslant 16$ at baseline. Patients were also administered at baseline the SCID-II (plus its screening questionnaire), the HAM-D-17, the Atypical Depression Diagnostic Scale (Quitkin *et al.* 1991), a semi-structured interview developed by researchers at the New York State Psychiatric Institute to assess the presence of atypical depression features, and the Anger Attack Questionnaire (AAQ) (Fava *et al.* 1991). The AAQ is a self-rated questionnaire that assesses whether patients report anger attacks, sudden outbursts of rage accompanied by irritability, violent/aggressive behaviour and symptoms of autonomic arousal (Fava *et al.* 1991).

Prior to entering the study, subjects provided written consent to their participation in the study. The consent form was approved by the Institutional Review Board of the Massachusetts General Hospital. The SCID-P, SCID-II, and HAM-D-17 interviews were conducted by psychiatrists and clinicians affiliated with the Depression Clinical and Research Program who were fully trained in the use of these instruments through live and videotaped interviews. During the 8 weeks of treatment with fluoxetine 20 mg/day, patients were seen every 2 weeks for safety and efficacy assessments. At the end of the 8-week acute phase of treatment, patients were re-administered the mood disorder module of the SCID-P, the SCID-II, and the HAM-D-17. These instruments were administered either by the same or different rater; we tried to minimize rater expectations by keeping the raters blind to the results of earlier assessments. When administering the SCID-II, raters instructed patients to include behavior prior to the onset of major depression as well as behaviour during the index episode.

The following criteria were exclusionary: pregnancy, breast-feeding, use of a birth control pill, serious suicide risk, history of neurological illness including seizure disorder, serious/unstable medical illness, organic mental disorders, substance use disorders active within the last year, schizophrenia, delusional disorder, bipolar disorder or antisocial personality disorder, mood congruent or mood incongruent psychotic features, history of multiple adverse drug reactions or allergy to the study drugs, current use of other psychotropic drugs and clinical or laboratory evidence of hypothyroidism. Patients were also excluded if they had a previous non-response to or intolerance of fluoxetine (60–80 mg/day) or to the combination of fluoxetine and desipramine or fluoxetine and lithium or if they had failed to respond during the course of their current major depressive episode to at least one adequate antidepressant trial ($\geqslant 6$ weeks of treatment with either $\geqslant 150$ mg of imipramine or its tricyclic equivalent, $\geqslant 60$ mg of fluoxetine or its SSRI equivalent, or $\geqslant 60$ mg of phenelzine or its monoamine oxidase inhibitor equivalent).

Statistical analyses

Mann–Whitney *U* test was used to assess differences in degree of improvement, as measured by the percent change in HAM-D-17 scores from baseline to endpoint, between patients who met criteria at baseline for each personality disorder cluster and those who did not. The McNemar test was used to determine whether there was a significant change in the rates of personality disorders after 8 weeks of treatment with fluoxetine 20 mg/day. If a reduction in rates of patients meeting criteria for each personality disorder cluster was observed, Mann–Whitney *U* test was used to assess differences in degree of improvement in depression severity, as measured by the percentage change in HAM-D-17 scores from baseline to endpoint, between two groups: those who continued to meet criteria at endpoint for at least one personality disorder within the cluster for which they had met criteria at baseline and those who no longer met criteria for the personality disorder cluster they had met at baseline. The paired *t* test was used to assess the changes in number of criteria met within each diagnostic category of personality disorders. The simple linear regression method was used to assess the relationship between degree of change in the number of criteria met within each diagnostic category and the percent change in

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HAM-D-17 scores from baseline to endpoint. Fisher's exact test was used to assess the relationship between these two groups (patients who continued to meet criteria for a personality disorder cluster and those who did not) and the following variables: presence of co-morbid anxiety disorders (as assessed with the SCID-P), history of past alcohol and substance abuse disorders (as assessed with the SCID-P), early onset ($\leqslant$ 18 years old) of first episode of major depression, the presence of anger attacks (as assessed with the AAQ), and the presence of atypical depression features (as assessed with the ADDS). Mann–Whitney *U* test was also used to assess the relationship between those patients who continued to meet criteria for a personality disorder cluster and those who did not and both the degree of depression severity at baseline (as measured with the HAM-D-17) and patients' age at entry. Bonferroni's correction was used to adjust for multiple comparisons.

RESULTS

The demographic and clinical characteristics of our out-patients with major depressive disorder are summarized in Table 1. There was a mean HAM-D-17 score of 19·7 $\pm$ 3·5 at baseline. The mean duration of the current depressive episode was 3·6 $\pm$ 7·7 years, with the following frequency of episodes: 130 (34%) out-patients had one depressive episode; 58 (15%) out-patients had two episodes, and 196 (51%) patients had three or more depressive episodes. Out of the 324 out-patients who finished the study, 193 (60%) out-patients were responders defined as a HAM-D-17 score $\leqslant$ 7 at endpoint after 8 weeks of fluoxetine 20 mg/day. At endpoint, there was a mean HAM-D-17 score of 9·6 $\pm$ 6·6, with a mean change of 51% from baseline to endpoint in HAM-D-17 scores.

Table 1. *Demographic and clinical characteristics of enrolled subjects*

	Entire sample* (N = 384)	
Demographic and clinical factors	Mean	S.D.
Age (years)	39·9	10·5
Gender: female, *N* (%)	210	(55)
Marital status, *N* (%)		
Never married	184	(48)
Employed, *N* (%)	240	(63)
Education, *N* (%)		
Some High School	15	(5)
High School/GED	54	(14)
$\geqslant$ 4 year college	314	(82)
Episodes of MDD, *N* (%)		
1 episodes	130	(34)
2 episodes	58	(15)
$\geqslant$ 3 episodes	196	(51)
Age of onset of first MDD (years)	25·9	13·4
Duration of current episode of MDD (years)	3·6	7·7
HAM-D-17 (Baseline)	19·7	3·5

* Values are: mean, S.D., unless stated otherwise.

Out of 384 subjects enrolled into our treatment study, 378 depressed out-patients were assessed for a personality disorder with the SCID-II at baseline. Two hundred and forty-three out-patients (64%) had at least one co-morbid personality disorder. Of those meeting criteria for personality disorders, 87 (36%) had one co-morbid personality disorder, 61 (25%) patients had two co-morbid personality disorders and 95 (39%) patients had three or more co-morbid personality disorders at baseline. As shown in Table 2 the most common personality disorders were obsessive–compulsive (30%), avoidant (29%) and paranoid (24%).

With regard to Clusters, 219 (58%) out-patients had at least one Cluster C personality disorder diagnosis, 98 (26%) out-patients had at least one Cluster B personality disorder diagnosis, and 99 (26%) out-patients had at least one Cluster A personality disorder diagnosis at baseline. As summarized in Table 3, we found no significant relationship between meeting criteria for any personality disorder or for any personality disorders cluster at baseline and treatment outcome (degree of improvement in depression as measured by percent change in HAM-D-17).

Three hundred and eleven out-patients completed the study and were assessed with the SCID-II at endpoint (see Table 2). Following 8 weeks of fluoxetine treatment, there was a significant (McNemar test; $P < 0{\cdot}05$; df = 1) reduction in the proportion of patients meeting criteria for avoidant (baseline 29% *v.* endpoint 20%), dependent (baseline 13% *v.* endpoint 7%), passive-aggressive (baseline 13% *v.* endpoint 9%), paranoid (baseline 24% *v.* endpoint 18%) and narcissistic (baseline 11% *v.* endpoint 5%) personality disorders (see Tables 2 and 4). After Bonferroni correction, the decrease in rates of personality disorder diagnoses was significant only for avoidant (see Table 4). There

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Table 2. *Rates of co-morbid personality disorders at baseline and at endpoint*

	Patients with a personality disorder			
	At baseline ($N = 378$)		At endpoint ($N = 311$)	
	N	(%)	*N*	(%)
Cluster A				
Paranoid	91	(24)	56	(18)
Schizoid	15	(4)	9	(3)
Schizotypal	13	(3)	4	(1)
Any diagnosis	99	(26)	59	(19)
Cluster B				
Histrionic	16	(4)	9	(3)
Borderline	58	(15)	36	(12)
Narcissistic	42	(11)	17	(5)
Antisocial	23	(6)	14	(5)
Any diagnosis	98	(26)	53	(17)
Cluster C				
Avoidant	108	(29)	63	(20)
Dependent	51	(13)	23	(7)
Obsessive–Compulsive	115	(30)	82	(26)
Passive aggressive	50	(13)	28	(9)
Self-defeating	51	(13)	29	(9)
Any diagnosis	219	(58)	136	(44)

Table 3. *Degree of improvement* (*as measured by the percentage change in HAM-D*-17 *scores from baseline to endpoint*) *among patients meeting criteria for personality disorder clusters at baseline* (N = 378)

			Percentage change in HAM-D-17 scores from baseline to endpoint	
Personality disorder diagnosis	Presence at baseline	*N* (%)	(Mean ± S.D.)	*P*
Any diagnosis	Yes	243 (64)	(45 ± 34)	NS
	No	135 (36)	(50 ± 33)	
Cluster A	Yes	99 (26)	(46 ± 31)	NS
	No	279 (74)	(47 ± 34)	
Cluster B	Yes	98 (26)	(43 ± 36)	NS
	No	280 (74)	(48 ± 33)	
Cluster C	Yes	219 (58)	(45 ± 35)	NS
	No	159 (42)	(50 ± 31)	

was no significant increase in rates of personality disorders. With regard to clusters, there was a significant reduction in the proportion of patients meeting criteria for Cluster C (baseline 58% *v.* endpoint 44%) (McNemar test; $P < 0{\cdot}001$; df = 1), Cluster A (baseline 26% *v.* endpoint 19%) (McNemar test; $P < 0{\cdot}01$; df = 1), and cluster B (baseline 24% *v.* endpoint 17%) (McNemar test; $P < 0{\cdot}01$; df = 1). None of the clinical variables we assessed (i.e. degree of improvement in depressive symptoms, presence of co-morbid anxiety disorders, history of past alcohol and substance abuse disorders, early onset of first episode of major depression, the presence of anger attacks, the presence of atypical depression features, severity of depression at baseline and age at entry) were significantly related to the change in Cluster diagnoses (i.e. from meeting criteria for a cluster to no longer meeting criteria for the same cluster).

From baseline to endpoint, there was a significant reduction in the mean number of criteria met for paranoid, schizotypal, narcissistic, borderline, avoidant, dependent, obsessive–compulsive, passive aggressive and self-

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Table 4. *Rates of changes in co-morbid personality disorders at endpoint* (N = 311)

	Patients presenting with a PD at baseline who no longer meet criteria after treatment		Patients meeting criteria for a PD at endpoint who did not meet criteria at baseline		McNemar test	
	N	%	*N*	%	χ^2	*P*
Cluster A						
Paranoid	36	47 (36/76)	16	7 (16/235)	6·64	0·01
Schizoid	6	55 (6/11)	4	1 (4/300)	0·064	NS
Schizotypal	6	67 (6/9)	1	0 (1/302)	1·64	NS
Any diagnosis	38	48 (38/80)	17	7 (17/231)	6·64	0·01
Cluster B						
Histrionic	7	70 (7/10)	6	2 (6/301)	0·46	NS
Narcissistic	21	64 (21/33)	5	2 (5/278)	6·64	0·01
Borderline	23	51 (23/45)	14	5 (14/266)	1·64	NS
Antisocial	9	50 (9/18)	5	2 (5/293)	0·46	NS
Any diagnosis	36	47 (36/76)	13	6 (13/235)	6·64	0·01
Cluster C						
Avoidant	36	40 (36/89)	10	4 (10/222)	60·83	0·001
Dependent	22	56 (22/39)	6	2 (6/272)	6·64	0·01
Obsessive–compulsive	34	36 (34/95)	22	10 (22/216)	0·16	NS
Passive aggressive	24	59 (24/41)	11	4 (11/270)	3·84	0·05
Self-defeating	23	58 (23/40)	12	4 (12/271)	2·71	NS
Any diagnosis	60	33 (60/180)	14	11 (14/131)	10·83	0·001

Table 5. *Rates of personality disorder traits at baseline and endpoint*

	Mean personality disorder traits reported at baseline (*N* = 307)		Mean personality disorder traits reported at endpoint (*N* = 307)		Pairwise *t* test
	Mean	S.D.	Mean	S.D.	*P*
Cluster A					
Paranoid	2·3	1·8	1·8	1·7	<0·0001*
Schizoid	0·9	1·2	0·7	1·0	0·006
Schizotypal	1·4	1·3	1·1	1·1	<0·0001*
Cluster B					
Histrionic	1·0	1·2	0·9	1·1	NS
Narcissistic	1·9	1·8	1·5	1·5	<0·0001*
Borderline	2·4	1·8	1·9	1·8	<0·0001*
Antisocial (*N* = 159)	0·8	1·6	0·7	1·5	NS
Cluster C					
Avoidant	2·2	2·0	1·7	1·8	0·0003*
Dependent	2·3	1·8	1·9	1·7	< 0·0001*
Obsessive–compulsive	3·2	2·0	2·9	2·1	<0·0001*
Passive aggressive	2·1	1·8	1·7	1·7	<0·0001*
Self-defeating	2·4	1·8	2·0	1·7	<0·0001*

* Significant after Bonferroni correction.

defeating personality disorders (see Table 5), following Bonferroni correction. We also observed significant relationships between degree of reduction in depressive symptoms (percentage change in HAM-D-17 scores) and degree of change in the number of criteria met for paranoid, narcissistic, borderline and dependent personality disorders after Bonferroni correction (see Table 6).

DISCUSSION

A significant proportion (64%) of our depressed out-patients met criteria for at least one co-morbid personality disorder. This is consistent with the findings of Shea and colleagues (1990) who found that 74% of 239 out-patients with major depressive disorder also met criteria for a personality disorder. The most common per-

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Table 6. *Degree of improvement* (*as measured by the percentage change in HAM-D*-17 *scores from baseline to endpoint*) *in relationship to degree of change in personality disorder traits* (*from baseline to endpoint*)

	Regression	
	R	*P*
Cluster A		
Paranoid	0·183	0·001*
Schizoid	0·095	NS
Schizotypal	0·077	NS
Cluster B		
Histrionic	0·046	NS
Narcissistic	0·216	0·0001*
Borderline	0·224	< 0·0001*
Antisocial†	0·100	NS
Cluster C		
Avoidant	0·18	0·002*
Dependent	0·24	< 0·0001*
Obsessive–compulsive	0·10	NS
Passive aggressive	0·13	0·020
Self-defeating	0·16	0·004

* Significant after Bonferroni correction.
† $N = 159$.

sonality disorders among our depressed patients were obsessive–compulsive and avoidant. These findings are also consistent with those of other studies (Shea *et al.* 1987; Pilkonis & Frank, 1988; Fabrega *et al.* 1991), which showed that cluster C diagnoses are most common among depressed out-patients. Of interest, about two-thirds of our patients with major depression and personality disorders met criteria for at least two co-morbid personality conditions, suggesting that most of the co-morbid diagnoses reported in depressed populations are accounted for by a smaller proportion of patients. These findings are also consistent with those of Zimmerman and colleagues (1991).

We found no significant relationship between treatment outcome (degree of improvement as measured by percentage change in HAM-D-17) and meeting criteria for any personality disorder or for any personality disorders cluster at baseline. This suggests that meeting criteria for co-morbid personality disorders at baseline is not a predictor of poorer antidepressant response. This is consistent with those findings of our previous study on a different patient population (Fava *et al.* 1994) and some other studies (Davidson *et al.* 1985; Parsons *et al.* 1989), but they are inconsistent with those of several studies in which the presence of a PD was associated with poorer outcome (Charney *et al.* 1981; Pilkonis & Frank, 1988; Reich, 1990). Of note, all of the studies linking personality disorders to poorer outcome had involved the use of tricyclic antidepressants while our two studies treated patients with fluoxetine. In addition, the measures used to assess PDs differ across studies.

Following fluoxetine treatment, we observed a significant reduction in the proportion of patients meeting criteria for avoidant, dependent, passive-aggressive, paranoid and narcissistic personality disorders, with no significant increases in rates of personality disorders. There was also a significant reduction in the proportion of patients meeting criteria for Clusters A, B and C. Using a more quantitative, dimensional approach, there were also significant reductions in the mean number of criteria met within all but three personality disorders. These changes are remarkable, as they show a consistent pattern of reduction in rates across all personality disorder diagnoses. This is consistent with the results of previous studies (Fava *et al.* 1994; Blais *et al.* 1998) that showed a significant reduction in the proportion of patients meeting criteria for at least four personality disorders following treatment with fluoxetine and ECT, respectively. However, while Joffe & Regan (1988) found that the prevalence of personality diagnoses of schizoid, avoidant, dependent, passive-aggressive, schizotypal and borderline personality disorder significantly decreased when the depression remitted, they also noted significant increases in trait scores on the histrionic, narcissistic, antisocial and compulsive personality scales.

When using a categorical approach (e.g. meeting or not meeting criteria for a specific personality disorder), our study showed the lack of a significant relationship between no longer meeting criteria for a personality disorder cluster diagnosis and the degree of improvement in depressive symptoms or other potential predictors (i.e. presence of co-morbid anxiety disorders, severity of depression at baseline, age at study entry, history of past alcohol and substance abuse disorders, early onset of first episode of major depression, the presence of anger attacks and the presence of atypical

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depression features). On the other hand, when a more quantitative, dimensional approach was used (e.g. assessing the number of criteria met within each diagnostic personality disorder category), we did observe a significant relationship between reduction in criteria met and degree of improvement in depressive symptoms for four of the nine personality disorders that had shown significant changes following treatment. While the observed significant relationships are consistent with the view that changes in personality disorder diagnoses in remitted patients are accounted for by the changes in their affective state, the relative lack of significant relationships with certain personality disorders seems to suggest that treatment with the antidepressant fluoxetine may be accompanied by significant changes in behaviours and attitudes that are part of those personality disorders and that may be independent from the changes in depression severity. This, again, is consistent with the observation that fluoxetine may actually be helpful in the treatment of personality disorders regardless of change in depression (Markovitz *et al*. 1991; Kapfhammer & Hippius, 1998) or even in non-depressed personality disorder patients (Salzman *et al*. 1995).

The limitations of our study are related to the fact that the population that we studied was derived from a sample of out-patients participating in a treatment clinical study and it is possible that our findings cannot be generalized to more severely ill, in-patient populations. In addition, the exclusion of patients with current co-morbid substance abuse and psychotic features may have also biased our sample. Given the lack of a placebo arm or of an active control, we cannot address the questions of whether any of the changes observed may be due to non-specific, placebo-like effects rather than true drug effects or whether or not these changes are uniquely related to fluoxetine. On the other hand, the two studies with fluoxetine in personality disorder patients did use a placebo control and showed the efficacy of this compound in their populations (Salzman *et al*. 1995; Kapfhammer & Hippius, 1998). Finally, though it is possible that unreliability of raters administration of the SCID-II could contribute to changes observed overtime in personality pathology, independent of treatment effect, changes due to unreliable ratings would be expected to be in either direction. Our findings consistently showed a reduction in rates of personality disorders, and this finding is consistent with the findings of our previous study when we used a self-rated personality measure (Fava *et al*. 1994). Furthermore, the percentage of patients no longer meeting criteria for a PD at endpoint ranges from 36% to 67% (mean range = 52%), while the percentage of patients who meet criteria for a PD only at endpoint ranges from 0% to 11% (mean range = 4·5%). Additionally, without a placebo control arm, we were unable to rule out any regression toward the mean in personality pathology diagnoses.

In summary, personality disorder diagnoses were found to be common among untreated outpatients with major depressive disorder. A significant proportion of these patients no longer met criteria for personality disorders following antidepressant treatment, and changes in personality disorder traits were significantly related to degree of improvement in depressive symptoms in some but not all personality disorders. These findings suggest that the relative lack of stability of personality disorder diagnoses among patients with current major depression may be due not only to changes in a depressive state, but also to possible treatment effects of antidepressants on behaviours and attitudes that comprise personality disorders.

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