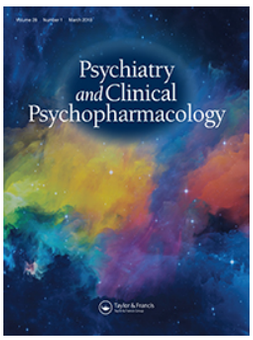

Taylor & Francis
Taylor & Francis Group

Psychiatry and Clinical Psychopharmacology

ISSN: 2475-0573 (Print) 2475-0581 (Online) Journal homepage: https://www.tandfonline.com/loi/tbcp21

The role of affective temperaments and chronotype in pharmacotherapy response in patients with obsessive-compulsive disorder

Ayse Sakalli Kani, Cana Aksoy Poyraz, B. Cağrı Poyraz, M. Reha Bayar, Ercan Akin & Samet Kose

To cite this article: Ayse Sakalli Kani, Cana Aksoy Poyraz, B. Cağrı Poyraz, M. Reha Bayar, Ercan Akin & Samet Kose (2018) The role of affective temperaments and chronotype in pharmacotherapy response in patients with obsessive-compulsive disorder, Psychiatry and Clinical Psychopharmacology, 28:1, 58-65, DOI: 10.1080/24750573.2017.1391157

To link to this article: https://doi.org/10.1080/24750573.2017.1391157

Published online: 27 Oct 2017.

PSYCHIATRY AND CLINICAL PSYCHOPHARMACOLOGY, 2018
VOL. 28, NO. 1, 58–65
https://doi.org/10.1080/24750573.2017.1391157

Taylor & Francis
Taylor & Francis Group

The role of affective temperaments and chronotype in pharmacotherapy response in patients with obsessive-compulsive disorder

Ayse Sakalli Kani[a], Cana Aksoy Poyraz[a], B. Cağrı Poyraz[a], M. Reha Bayar[a], Ercan Akin[b] and Samet Kose [b,c,d]

[a]Department of Psychiatry, Istanbul University Cerrahpasa School of Medicine, Istanbul, Turkey; [b]Department of Psychology, Hasan Kalyoncu University, Gaziantep, Turkey; [c]Department of Psychiatry, University of Texas Medical School of Houston, Houston, TX, USA; [d]Center for Neurobehavioral Research on Addictions, Houston, TX, USA

ABSTRACT

BACKGROUND: Comorbid mood disorders affect the prognosis of obsessive-compulsive disorder (OCD) negatively. Affective temperaments are assumed to be subsyndromal symptoms and precursors of mood disorders, but its effects on OCD outcome still remain unclear. There is a body of evidence, which supports the association between circadian rhythm disturbances and mood disorders in the literature. In contrast, there is limited data concerning the effects of chronobiological differences among the patients with OCD and OCD comorbid mood disorders. The main objective of this present study was to examine the clinical effects of affective temperaments and chronotype differences in patients with OCD.

METHODS: The study participants were 76 patients with OCD, who have been under treatment at least for 12 weeks, and 55 healthy controls. The participants were administered the Yale-Brown Obsessive Compulsive Scale, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire, Morningness and Eveningness Questionnaire, Hamilton Depression Rating Scale, and Hamilton Anxiety Scale.

RESULTS: OCD patients scored higher in depressive, cyclothymic, irritable, and anxious temperament scores compared to the healthy controls. There were significant differences between patients with remission and not remission in depressive, cyclothymic, irritable, and anxious temperaments. Eveningness chronotype was more frequent in OCD patients; however, the difference was not statistically significant.

CONCLUSIONS: Understanding the effects of affective temperaments and chronotype differences on the outcome of patients with OCD might provide valuable insights in developing new treatment approaches especially in treatment-resistant OCD cases.

ARTICLE HISTORY
Received 3 October 2017
Accepted 9 October 2017

KEYWORDS
Obsessive-compulsive disorder; affective temperament; chronotype; treatment outcome; circadian rhythm disturbances; comorbidity

Introduction

Obsessive-compulsive disorder (OCD) is a frequent mental health problem that leads to a significant impairment in daily and occupational functioning [1]. Researchers show that approximately 40–60% of OCD patients do not respond adequately to an initial selective serotonin reuptake inhibitor (SSRI) treatment and even with a positive treatment response only a minority of patients experience long-term clinical remission from the disorder. In addition, the initial response to pharmacotherapy is assumed to be related to long-term clinical outcome [2,3].

It is well known that together with other comorbidities in OCD, mood disorders also co-occur commonly and influence the prognosis of OCD negatively [4–6]. The presence of comorbid affective disorders in OCD is related to chronicity, severity, and greater comorbidity with other psychiatric disorders. Also, OCD subjects comorbid with mood disorders may require more sophisticated pharmacological treatments and higher numbers of hospitalizations [7]. However, it still remains unclear whether affective comorbidity is a complication of poor treatment response or chronicity in OCD or a distinct subtype causing to treatment resistance [8,9].

Akiskal described five affective temperament types as depressive (having a sensitivity to suffering), cyclothymic (bearing rapid shifts in mood and energy), irritable (being moody, choleric, and impulsive), hyperthymic (having over-energetic and over-confident traits), and anxious (having exaggerated tendency to be worry) [10]. Affective temperaments, described by Akiskal, are assumed to be long-term subclinical manifestations or phenotypes of mood disorders and exist in a continuum between healthy emotional reactivity types and major affective disorders [10,11]. Studies reported that affective temperaments are genetically determined, biologically inheritable personality traits and may be precursors of mood disorders and influence the development, clinical appearance, and course of the disorders [11,12]. While the same features might make a

CONTACT Ayşe Sakallı Kani ayse_sakalli@hotmail.com Marmara Üniversitesi, Fevzi Çakmak Mah. Muhsin Yazıcıoğlu Cad. No: 10, Üst Kaynarca/Pendik, Istanbul, Turkey

very important part of human nature, in the case of extreme severity of the features associated with given type of temperament, they may become a risk factor for mood and other psychiatric disorders. Furthermore, there is evidence that affective temperaments can influence the antidepressant response and recovery from mood episodes [13]. To identify affective temperaments, the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire (TEMPS-A) was developed [14] and has been used in numerous studies and extensively validated in both clinical and non-clinical samples [15,16].

Limited research has been conducted regarding the effects of affective temperament in OCD patients. Hountouche et al. investigated the presence of soft bipolar comorbidity using self-rated Angst's Checklist of Hypomania and that for the cyclothymic temperament and reported that cyclothymic OCD patients had more severe symptoms, more episodic course, and poorer response to antidepressant treatment compared to non-cyclothymic patients [17]. Another study reported that OCD patients with cyclothymic temperament (by using the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Interview version (TEMPS-I)) had lower mean age at disorder onset, higher scores at the Hamilton Anxiety Rating Scale (HAM-A), more repeating compulsions, higher rates of eating disorder comorbidity, OCD spectrum disorder comorbidity, and higher rates of Axis II (personality disorders) comorbidity [18]. Finally, the only study that measured affective temperaments by using the TEMPS-A revealed higher rates of cyclothymic, depressive, and irritable temperament in the treatment-resistant group compared to good responders [19].

Chronotype is defined as natural inclinations with respect to individual's circadian preference for timing to sleep or perform daily activities while alert and energetic. According to circadian typology, evening types are characterized by the later bed and rising times, more irregular sleep–wake up habits, ascending evening energy, and a preference for nocturnal activities; morning types have earlier bed and rising times, greater morning energy, and a preference for diurnal activities. Those people without a clear preference are termed as either or intermediate type [20,21]. Studies have provided evidence in terms of the association between circadian preferences and mood disorders, especially eveningness type has been found to be related with depression [22–25] and bipolar disorder [26–28]. Recently, several studies examined the relationship between chronotypes and affective temperaments and revealed that morningness chronotype was associated with hyperthymic temperament [29,30] which has been recognized as a protective factor against most mental disorders [31]. Evening type was reported as significantly associated with depressive, cyclothymic, irritable, and anxious temperaments [30]. These findings suggest that circadian preference might have a possible role in the occurrence of subthreshold affective traits and lead to a vulnerability to mood disorders.

There are data suggesting that circadian rhythm disruptions might play a role in the pathogenesis of OCD [32]. These findings are based on the results of successful agomelatine augmentation in treatment-resistant OCD patients [33–35], and several studies demonstrating hormonal dysregulation [36–38] and delayed sleep phase syndrome (DSPS) in patients with OCD [39,40]. Patients with DSPS were found to have more severe OCD symptoms and comorbid depression. In addition, DSPS was associated with a decrease in social and occupational functioning [39]. However, while there is evidence regarding abnormal circadian rhythms and chronotype differences, their possible relationship with subclinical mood disorders in OCD have not been established.

In the present study, we aimed to examine affective temperament and chronotype differences in patients with OCD compared with healthy controls with a more specific focus on the role of affective temperaments and chronotype differences in pharmacotherapy response.

Material and methods

Setting and sample

This cross-sectional study was conducted in outpatients with OCD who presented to Istanbul University Cerrahpasa School of Medicine's Psychiatry Department in Istanbul, Turkey. The study sample comprised 76 outpatients (50 women and 26 men) with a mean age of 32.53 years (SD ± 11.09) who were diagnosed with OCD according to Diagnostic and Statistical Manual of Mental Disorders Fourth Edition – Text Revision (DSM-IV-TR) criteria [41] and 55 healthy controls (32 women and 23 men) with a mean age of 34.36 (SD ± 9.93) years. Patients were eligible for the study if they had been under treatment for at least for 12 weeks with a minimum effective SSRI dose accepted for OCD treatment and ± antipsychotic medication [42]. The exclusion criteria for the participants included a history of neurological disorder, head trauma, mental retardation, and psychotic disorders. Furthermore, patients who were diagnosed primarily with bipolar disorder and comorbid with OCD, and healthy individuals who had a history of significant mood symptoms were not included in the study. The study was approved by the Istanbul University School of Medicine's Ethics Committee, and all participants provided written informed consents.

Measures

Through the semi-structured sociodemographic and clinical data form, the following information was

collected: patients' gender, age, marital status, educational attainment, age of disorder onset, types of obsessions and compulsions, the course of the disorder, history of comorbid tic disorders, treatment information, and family history for psychiatric disorders. The Yale-Brown Obsessive Compulsive Scale (Y-BOCS) [43], Hamilton Depression Rating Scale (HAM-D) [44], and HAM-A [45] were used to assess clinical severity of OCD and comorbid depressive and anxiety symptoms. Remission was defined as achieving a Y-BOCS total score of ≤16 [3].

To evaluate the affective temperaments, the Turkish version of TEMPS-A, a 99-item Yes-or-No self-report auto-questionnaire, was used. The validity and reliability of Turkish TEMPS-A have been established by Vahip et al. [46]. Cut-off scores to determine the dominant temperament were 13 for depressive mood (18 items), 18 for cyclothymic (19 items), 20 for hyperthymic (20 items), 13 for irritable (18 items), and 18 for anxious (24 items). It is possible for an individual to have more than one dominant affective temperament.

Chronotype was assessed by using the Morningness and Eveningness Questionnaire (MEQ) [47], which is a 19-item self-rated questionnaire providing an evaluation of habitual rising and bedtimes, preferred times of physical and mental performance, and subjective alertness after rising and before going to bed. The MEQ yields total scores ranging from 16 to 86. Higher scores indicate greater morningness, and lower scores indicate greater eveningness. MEQ classifies participants who score between 59 and 86 as morning types, those who score 42–58 as neither types and those who score 16–41 as evening types. The psychometric properties of the Turkish version of the MEQ were examined by Agargun et al. and its validity and reliability were found to be as high as the original version [48].

Data analysis

Prior to data analysis, the data were checked for normality using analytical (Kolmogorov–Smirnov/Shapiro–Wilk's tests) and visual methods (histograms and probability plots). With the exception of age and year(s) of education, the variables were not normally distributed. Because the data failed the tests of normality, nonparametric tests were used in statistical analyses. A Mann–Whitney *U* test was used to compare the ordinal data between the independent groups, and the categorical variables were compared with a chi-square and Fisher's exact test. Hierarchical regression analyses were used to test significant predictors of Y-BOCS. To reduce the risks of false positives in the correlation analyses, a significance level of $p < .01$ was adapted. For the remaining analyses, statistical significance was established at $p < .05$. The statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 21.0 (SPSS, Inc., Chicago, IL, USA).

Results

Sociodemographic characteristics of the patient group and the healthy controls are presented in Table 1. The average age was 32.53 in the group of patients and 34.36 in the control group. The patient group consisted of 50 females (65.8%) and 26 males (34.2%), and the control group consisted of 32 females (58.2%) and 23 males (41.8%). Furthermore, the majority participants in the patient group (56.6%) and the major participants in the control group (52.7%) were single. There were no statistically significant differences between the patient group and the healthy controls in terms of gender, age, and educational status.

To evaluate the differences between the patients and the healthy controls in terms of affective temperament characteristics; cyclothymic, depressive, irritable, hyperthymic, and anxious subscales of TEMPS-A were used. While there was no significant difference in terms of hyperthymic temperament ($p = .955$), the Mann–Whitney *U* test revealed that depressive ($U = 1428.000$, $z = -3.099$, $p = .002$), cyclothymic ($U = 1066.000$, $z = -4.787$, $p = .000$), irritable ($U = 1391.000$, $z = -3.278$, $p = .001$), and anxious ($U = 1099.000$, $z = -4.631$, $p = .000$) temperament scores were significantly higher in the patient group. The results of affective temperament between the patient groups and healthy controls are presented in Table 2.

OCD patients were divided into two groups as patients in remission (YBOC-S scores < 16) and not in remission (YBOC-S scores > 16). Affective temperament, comorbid anxiety, and comorbid depression scores of these two groups were compared. Anxious ($U = 375.500$, $z = -3.010$, $p = .003$), irritable ($U = 440.500$, $z = -2.304$, $p = .021$), cyclothymic ($U = 430.500$, $z = -2.412$, $p = .016$), and depressive temperament ($U = 324.500$, $z = -3.573$, $p < .005$) scores were significantly higher in the OCD patients who were not in remission compared to the OCD patients who were in remission as a results of the treatment.

Table 1. Sociodemographic characteristics of sample.

	Patient group $n = 76$	Control group $n = 55$
Age		
Female	34.90 ± 10.84	33.78 ± 9.20
Male	27.96 ± 10.29	35.17 ± 9.20
Total	32.53 ± 11.09	34.36 ± 9.93
Gender *n* (%)		
Female	50 (65.8)	32 (58.2)
Male	26 (34.2)	23 (41.8)
Marital Status *n* (%)		
Single	43 (56.6)	25 (45.5)
Married	26 (34.2)	29 (52.7)
Other	7 (9.2)	1 (1.8)

Note: Percentages are shown in parentheses.

Table 2. Differences between the study groups in terms of affective temperament characteristics.

Scale	Group	Mean rank	U	z	p
Depressive Temperament	Patient	74.71	1428.000	−3.099	**.002**
	Control	53.96			
Cyclothymic Temperament	Patient	79.47	1066.000	−4.787	**.000**
	Control	47.38			
Hyperthymic Temperament	Patient	65.84	2078.000	−0.056	**.955**
	Control	66.22			
Irritable Temperament	Patient	75.20	1291.000	−3.278	**.001**
	Control	53.29			
Anxious Temperament	Control	79.04	1099.000	−4.631	**.000**
	Patient	47.98			

Hyperthymic temperament ($U = 434.5$, $z = -2.36$, $p = .18$), although not statistically significant, was found to be higher in the OCD patients in remission compared to the OCD patients who were not in remission. Furthermore, anxiety ($U = 261.000$, $z = -4.264$, $p < .005$) and depression ($U = 272.000$, $z = -4.145$, $p < .005$) scores were statistically significantly higher in the OCD patients in remission group compared to the group who were not in remission. Differences between the OCD patients in remission and not in remission in terms of affective temperament characteristics, and comorbid anxiety and depression are presented in Table 3.

When the frequencies of being diagnosed with a dominant temperament were evaluated, 22 (28.9%) participants in the OCD patient group and 4 (7.3%) participants in the control group had the dominant affective temperament. Depressive (21.1%), anxious (14.5%), irritable (5.3%), and cyclothymic (2.6%) temperament were predominant among the OCD patients. On the other hand, while there were no participants in the control group who were diagnosed with cyclothymic and anxious temperament, depressive (5.5%), and irritable (1.8%) temperament were predominant among the healthy controls. In both patients and healthy control group, predominance of hyperthymic temperament was not observed. Depressive ($\chi^2 = 6.261$, df = 1, $p < .05$) and anxious ($\chi^2 = 8.690$, df = 1, $p < .05$) diagnoses were found to be statistically

Table 3. Differences between the patients in remission and not in remission in terms of affective temperament characteristics, comorbid depression, and anxiety.

Scale	Group	Mean rank	U	z	p
Depression	In remission	23.96	272.000	−4.145	**.000**
	Not in remission	46.06			
Anxiety	In remission	23.54	261.000	−4.264	**.000**
	Not in remission	46.28			
Depressive Temperament	In remission	25.98	324.500	−3.573	**.000**
	Not in remission	45.01			
Cyclothymic Temperament	In remission	30.06	430.500	−2.412	**.016**
	Not in remission	42.89			
Hyperthymic Temperament	In remission	46.79	434.500	−2.268	**.018**
	Not in remission	34.19			
Irritable Temperament	In remission	30.44	440.500	−2.304	**.021**
	Not in remission	42.69			
Anxious Temperament	In remission	27.94	375.500	−3.010	**.003**
	Not in remission	43.99			

Table 4. Comparison of the patients and the controls in terms of dominant temperament.

	The patient group		The control group			
Dominant temperament	n	%	n	%	Test	p
Depressive temperament	16	21.1	3	5.5	df = 1, $\chi^2 = 6.261$	**.012**
Cyclothymic temperament	2	2.6	0	0	Fisher's exact test	.509
Hyperthymic temperament	–	–	–	–	–	–
Irritable temperament	4	5.3	1	1.8	Fisher's exact test	.398
Anxious temperament	11	14.4	–	–	df = 1, $\chi^2 = 8.690$	**.003**

Note: Fisher's exact test was used for expected cell frequencies is 5 or less.

significantly higher in the patient group compared to the healthy controls. There were 22 (28.9%) participants who have been diagnosed with any predominant temperaments in the patient group. In the control group, YBOC-S scores ($U = 327$, $z = -3.06$, $p = .002$), obsession subscale scores ($U = 353$, $z = -2.76$, $p = .006$), and compulsion subscale scores ($U = 370.5$, $z = -2.56$, $p = .01$) of participants who had a dominant temperament were statistically higher than those who did not (Table 4).

In order to evaluate the chronobiologic features between the OCD patient groups and the healthy controls, the MEQ was administered. Participants were divided into three groups in terms of morningness, intermediate, and eveningness. When frequencies are evaluated, eveningness was more frequent in the OCD patient group. The difference between the OCD patient group and the healthy controls was almost marginally significant ($p = .06$). In addition, in the patient group, there were no statistically significant differences between morningness, intermediate, and eveningness group in terms of total YBOC-S, obsession, and compulsion subscale ($p > .05$). There were no statistically significant differences between three chronotypes in HAM-D and HAM-A scores. The frequencies of the participants in terms of chronobiology are presented in Table 5.

The hypothesized relationship between Y-BOCS and age, gender, and TEMPS-A subscales was examined in two separate hierarchical multiple regression analyses. The demographic variables (age and gender) were entered in the first step of the hierarchical multiple regression. TEMPS-A subscales were entered in the second step of the hierarchical regression analysis. The results of the regression analyses with the two sets of predictor are presented in Table 6. The results indicated that TEMPS-A subscales were significant predictors of Y-BOCS ($R^2 = 0.333$, $F = 4.855$, $p < .001$).

Table 5. The chronobiologic features between the OCD patients and the healthy controls.

Chronotype	Patient group	Healthy group	χ^2 (df = 2)	p
Morningness	9 (11.8)	15 (27.3)	$\chi^2 = 5.465$	.06
Intermediate	50 (65.8)	32 (58.2)		
Eveningness	17 (22.4)	8 (14.5)		

Note: Percentages are shown in parentheses.

Table 6. Results of multiple linear regression for Y-BOCS predictors.

		B	Beta	*t*	*p*
Model 1	(Constant)	7.820		1.710	.091
	Age	0.253	0.281	2.417	.018
	Gender	1.790	0.086	0.735	.464
Model 2	(Constant)	10.555		1.949	.055
	Age	0.137	0.153	1.321	.191
	Gender	−0.275	−0.013	−0.119	.906
	Depressive Temperament	0.180	0.084	0.461	.646
	Cyclothymic Temperament	0.722	0.337	2.213	.030
	Hyperthymic Temperament	−0.600	−0.245	−2.022	.047
	Irritable Temperament	−0.019	−0.007	−0.060	.953
	Anxious Temperament	0.098	0.060	0.376	.708

Notes: Dependent variable: YBOC-S scores. $R^2 = 0.333$, $p < .001$.

Discussion

In this present study, we aimed to examine the clinical characteristics of affective temperaments and chronotype differences in patients with OCD.

The first major finding of this study was that in OCD patients, affective temperament scores were higher than healthy individuals, except for hyperthymic temperament scores. The second finding was that OCD patients without remission had higher depressive, anxious, irritable, and cyclothymic affective temperament scores compared to patients with remission.

These findings suggested that, in addition to obsessions and compulsions in OCD patients, more subthreshold mood disturbances were seen in these patients than in healthy control subjects. It has been known for a long time that mood disorders such as concurrent depression and bipolar disorder are common in OCD patients [4]. In a study conducted by Timpano et al., it was stated that 13.1% of the patients had bipolar disorder and 64.1% had major depressive disorder or dysthymic disorder accompanying OCD [49]. The result of this present study seemed reasonable and expected if the affective temperaments are thought to be precursors and subthreshold indications of mood disorders. Furthermore, why the scores of affective temperament were higher in OCD patients than in healthy subjects is still an arguable issue. There are opinions in the previous literature that OCD should be classified as a mood disorder rather than as a distinct disorder. The rationales for this argument are the frequent occurrence of depressive symptoms in OCD patients, major depressive disorder being the most common comorbid disorder in OCD probands, and 50–90% frequent emergence of mood disorders in OCD patients' follow-up exams [50]. Furthermore, genetic variants in the serotonin transporter gene, SLC6A4 gene, brain-derived neurotrophic factor gene, and rare chromosomal abnormalities such as 22q11 microdeletion syndrome are presented as supporting data on the relationship between OCD and mood disorders [51]. In addition, the phenomenological overlap between OCD and depression, such as agitation, indecisiveness, guilt, and some cognitive traits, response to similar antidepressant treatments, and frequent occurrence of depressive mood disorders in OCD families may suggest a genetic predisposition between OCD and depression [49]. As a result of the present study, all temperament scores, except for hyperthymic temperament scores, are significantly higher in OCD patients than in healthy subjects, suggesting that OCD may be part of the spectrum of mood disorders.

The finding that there is no significant difference between the OCD patients and healthy controls in terms of hyperthymic temperament scores can be explained by different approaches. Hyperthymic temperament was reported to be associated more with mania in previous studies [52,53]. The inclusion of patients with OCD followed by a bipolar disorder diagnosis in the present study might explain this difference since our study group had only seven patients with a history of hypomanic/manic shift associated with OCD treatment. Another possible cause of not detecting the hyperthymic temperament in the patient group may be related to the fact that the hyperthymic type is considered as a protective temperament type against mental disorders. In an epidemiological study conducted by Karam et al., the relationship between temperament types and DSM IV Axis I mental disorders was examined and hyperthymic temperament was found to be protective against most of the mental disorders except for separation anxiety, bipolar disorder, substance abuse, and impulse control disorders. Furthermore, low hyperthymic temperament scores predicted mood and anxiety disorders as a result of further analysis [31].

Another finding we found in this present study was that in patients who have dominant temperament, total YBOC-S, obsession, and compulsion subscale scores were significantly higher than those not. Depressive, cyclothymic, irritable, and anxious temperament scores were significantly higher in OCD patients with non-remission. Hyperthymic temperament scores were higher in those with remission. However, there is very limited data and this finding is in line with a study that investigated the effect of affective temperaments in treatment-resistant OCD patients [19]. In this study, cyclothymic depressive and irritable temperament scores were found to be higher in treatment-resistant group with higher rates of psychiatric admission, suicide attempts, compulsions, and psychiatric comorbidities than treatment responders. No significant differences were reported regarding hyperthymic temperament scores between the study groups [19].

In this present study, HAM-D and HAM-A scores were significantly higher in the non-remission group than in the remission group. This result was in agreement with the literature that other mood disorders

and anxiety disorders accompanying OCD adversely affect the course of treatment [7]. It is open to debate whether the factors that play a role in the negative response to treatment in our study are associated with depression and anxiety or they are the affective temperament characteristics of OCD patients. Even though scales designed to evaluate the affective temperament characteristics have indicated that the respondents should answer the questions taking all their lives into account, the current mood they feel at that moment may have affected their responses to the questions. On the contrary, the underlying affective temperament traits may have led patients to have higher depression and anxiety symptoms. There was a positive correlation between HAM-A and HAM-D scores in OCD patients and all temperament scores except for hyperthymic temperament scores. This finding differs from affective temperament studies in the literature. In a study conducted by Hantouche and colleagues, episodes of manic/hypomanic and major depression and more episodic course of OCD were seen more frequently in cyclothymic OCD patients. In addition, it was emphasized that higher rates of suicide attempts and hospitalizations in cyclothymic OCD patients were observed and, finally, the response to treatment was worse. Based on all these findings, it was stated that cyclothymic OCD might be a distinct OCD form with different clinical features, different course, and treatment outcome [17]. In a study conducted by Ambrosio et al., the relationship between affective temperament characteristics, demographic variables, age at onset, obsessive-compulsive symptomatology, personality disorders, anxiety, and depression in OCD patients were explored. As a result of the research, it was stated that 53.9% of the patients had a dominant temperament and 19.2% of the patients had the cyclothymic temperament. OCD patients with cyclothymic temperament showed earlier age at onset, higher HAM-A scores, and recurrent compulsions. It was suggested that cyclothymic OCD might be a more severe and complicated disorder, prone to bipolarity [18]. In our study, the prevalence of predominantly affective temperament in OCD patients was 28.9% and the cyclothymic temperament rate was 2.6%. The frequency of cyclothymic temperament was significantly higher in literature. There can be several different reasons for this difference. First, the number of patients included in our study includes fewer patients compared to the studies conducted, which may have led to a lack of meaningful difference in terms of clinical features between temperaments. Second, cyclothymia was assessed with different scales (Hypomania Symptom Checklist, Cyclothymic Temperament Scale, and TEMPS-I).

In terms of chronobiology, although there are studies indicating that circadian rhythm impairments such as DSPS lead to an increase in OCD symptoms [40,54] as far as we know, there are no studies investigating chronotype differences and its relationship with clinical features in patients with OCD. In this present study, the frequency of chronotype was compared between the patient group and the control group. As a result, morningness type was found more frequent in the healthy controls while eveningness type was more frequent in OCD patients. The difference between the two groups was almost statistically significant. This result may be related to the low number of participants and the lack of an adequate number of evening and morning types.

To the best of our knowledge, the present research is the first to compare OCD patients with healthy controls in terms of affective temperament and chronobiology. However, several limitations should be considered in this study. First, the OCD group has fewer patients compared to the previous studies examining affective temperament characteristics in OCD population. Second, the differences in drug dosages and the duration of treatments of patients included in the study might present as confounds. And finally, the cross-sectional nature of our research is among the limitations of our study.

In conclusion, this present study revealed that affective temperament features are distinctively common in OCD patients compared to healthy individuals and patients with poor treatment response compared to good responders. However, larger patient samples and prospective studies are needed to support the validity of the findings in our study. If the relationship between chronobiology and affective temperament is understood better, chronotherapy would gain importance in the evaluation and treatment of subclinical affective features. Finally, determination of the effect of subclinical affective characteristics in OCD patients, especially those with inadequate treatment response, may be a guide for the development of new treatment approaches.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Samet Kose http://orcid.org/0000-0003-0841-004X

References

[1] Asnaani A, Kaczkurkin AN, Alpert E, et al. The effect of treatment on quality of life and functioning in OCD. Compr Psychiatry. 2017;73:7–14. doi:10.1016/j.comppsych.2016.10.004.

[2] Bloch MH, Green C, Kichuk SA, et al. Long-term outcome in adults with obsessive-compulsive disorder. Depress Anxiety. 2013;30(8):716–722. doi:10.1002/da.22103.

[3] Pallanti S, Quercioli L. Treatment-refractory obsessive-compulsive disorder: methodological issues, operational definitions and therapeutic lines. Prog Neuropsychopharmacol Biol Psychiatry. 2006;30(3):400–412. doi:10.1016/j.pnpbp.2005.11.028.
[4] Perugi G, Akiskal HS, Pfanner C, et al. The clinical impact of bipolar and unipolar affective comorbidity on obsessive-compulsive disorder. J Affect Disord. 1997;46(1):15–23.
[5] Tukel R, Meteris H, Koyuncu A, et al. The clinical impact of mood disorder comorbidity on obsessive-compulsive disorder. Eur Arch Psychiatry Clin Neurosci. 2006;256(4):240–245. doi:10.1007/s00406-006-0632-z.
[6] Viswanath B, Narayanaswamy JC, Rajkumar RP, et al. Impact of depressive and anxiety disorder comorbidity on the clinical expression of obsessive-compulsive disorder. Compr Psychiatry. 2012;53(6):775–782. doi:10.1016/j.comppsych.2011.10.008.
[7] Pallanti S, Grassi G, Sarrecchia ED, et al. Obsessive-compulsive disorder comorbidity: clinical assessment and therapeutic implications. Front Psychiatry. 2011;2:70. doi:10.3389/fpsyt.2011.00070.
[8] Amerio A, Tonna M, Odone A, et al. Course of illness in comorbid bipolar disorder and obsessive-compulsive disorder patients. Asian J Psychiatr. 2016;20:12–14. doi:10.1016/j.ajp.2016.01.009.
[9] Yap K, Mogan C, Kyrios M. Obsessive-compulsive disorder and comorbid depression: the role of OCD-related and non-specific factors. J Anxiety Disord. 2012;26(5):565–573. doi:10.1016/j.janxdis.2012.03.002.
[10] Akiskal KK, Akiskal HS. The theoretical underpinnings of affective temperaments: implications for evolutionary foundations of bipolar disorder and human nature. J Affect Disord. 2005;85(1–2):231–239. doi:10.1016/j.jad.2004.08.002.
[11] Vazquez GH, Tondo L, Mazzarini L, et al. Affective temperaments in general population: a review and combined analysis from national studies. J Affect Disord. 2012;139(1):18–22. doi:10.1016/j.jad.2011.06.032.
[12] Rihmer Z, Akiskal KK, Rihmer A, et al. Current research on affective temperaments. Curr Opin Psychiatry. 2010;23(1):12–18. doi:10.1097/YCO.0b013e32833299d4.
[13] de Aguiar Ferreira A, Vasconcelos AG, Neves FS, et al. Affective temperaments and antidepressant response in the clinical management of mood disorders. J Affect Disord. 2014;155:138–141. doi:10.1016/j.jad.2013.10.038.
[14] Akiskal HS, Akiskal KK, Haykal RF, et al. TEMPS-A: progress towards validation of a self-rated clinical version of the Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego Autoquestionnaire. J Affect Disord. 2005;85(1–2):3–16. doi:10.1016/j.jad.2004.12.001.
[15] Solmi M, Zaninotto L, Toffanin T, et al. A comparative meta-analysis of TEMPS scores across mood disorder patients, their first-degree relatives, healthy controls, and other psychiatric disorders. J Affect Disord. 2016;196:32–46. doi:10.1016/j.jad.2016.02.013.
[16] Walsh MA, Brown LH, Barrantes-Vidal N, et al. The expression of affective temperaments in daily life. J Affect Disord. 2013;145(2):179–186. doi:10.1016/j.jad.2012.07.026.
[17] Hantouche EG, Angst J, Demonfaucon C, et al. Cyclothymic OCD: a distinct form? J Affect Disord. 2003;75(1):1–10.
[18] D'Ambrosio V, Albert U, Bogetto F, et al. Obsessive-compulsive disorder and cyclothymic temperament: an exploration of clinical features. J Affect Disord. 2010;127(1–3):295–299. doi:10.1016/j.jad.2010.06.007.
[19] Hantouche EG, Demonfaucon C. Toc résistant: caractéristiques cliniques, facteurs prédictifs et influence des tempéraments affectifs. L'Encéphale. 2008;34(6):611–617. doi:10.1016/j.encep.2007.12.008.
[20] Adan A, Archer SN, Hidalgo MP, et al. Circadian typology: a comprehensive review. Chronobiol Int. 2012;29(9):1153–1175. doi:10.3109/07420528.2012.719971.
[21] Ottoni GL, Antoniolli E, Lara DR. Circadian preference is associated with emotional and affective temperaments. Chronobiol Int. 2012;29(6):786–793. doi:10.3109/07420528.2012.679329.
[22] Antypa N, Vogelzangs N, Meesters Y, et al. Chronotype associations with depression and anxiety disorders in a large cohort study. Depress Anxiety. 2016;33(1):75–83. doi:10.1002/da.22422.
[23] Merikanto I, Kronholm E, Peltonen M, et al. Circadian preference links to depression in general adult population. J Affect Disord. 2015;188:143–148. doi:10.1016/j.jad.2015.08.061.
[24] Merikanto I, Lahti T, Kronholm E, et al. Evening types are prone to depression. Chronobiol Int. 2013;30(5):719–725. doi:10.3109/07420528.2013.784770.
[25] Muller MJ, Kundermann B, Cabanel N. Eveningness and poor sleep quality independently contribute to self-reported depression severity in psychiatric inpatients with affective disorder. Nord J Psychiatry. 2016;70(5):329–334. doi:10.3109/08039488.2015.1112832.
[26] Ahn YM, Chang J, Joo YH, et al. Chronotype distribution in bipolar I disorder and schizophrenia in a Korean sample. Bipolar Disord. 2008;10(2):271–275. doi:10.1111/j.1399-5618.2007.00573.x.
[27] Melo MC, Abreu RL, Linhares Neto, VB, et al. Chronotype and circadian rhythm in bipolar disorder: a systematic review. Sleep Med Rev. 2016. doi:10.1016/j.smrv.2016.06.007
[28] Robillard R, Naismith SL, Rogers NL, et al. Delayed sleep phase in young people with unipolar or bipolar affective disorders. J Affect Disord. 2013;145(2):260–263. doi:10.1016/j.jad.2012.06.006.
[29] Chrobak AA, Tereszko A, Dembinska-Krajewska D, et al. Morningness-eveningness and affective temperaments assessed by the temperament evaluation of Memphis, Pisa and San Diego-Autoquestionnaire (TEMPS-A). Chronobiol Int. 2016: 1–9. doi:10.1080/07420528.2016.1236806.
[30] Park CI, An SK, Kim HW, et al. Relationships between chronotypes and affective temperaments in healthy young adults. J Affect Disord. 2015;175:256–259. doi:10.1016/j.jad.2015.01.004.
[31] Karam EG, Salamoun MM, Yeretzian JS, et al. The role of anxious and hyperthymic temperaments in mental disorders: a national epidemiologic study. World Psychiatry. 2010;9(2):103–110.
[32] Lange KW, Lange KM, Hauser J, et al. Circadian rhythms in obsessive-compulsive disorder. J Neural Transm (Vienna). 2012;119(10):1077–1083. doi:10.1007/s00702-012-0805-z.
[33] Coles ME, Sharkey KM. Compulsion or chronobiology? A case of severe obsessive-compulsive disorder treated with cognitive-behavioral therapy augmented with chronotherapy. J Clin Sleep Med. 2011;7(3):307–309. doi:10.5664/jcsm.1080.

[34] da Rocha FF, Correa H. Is circadian rhythm disruption important in obsessive-compulsive disorder (OCD)? A case of successful augmentation with agomelatine for the treatment of OCD. Clin Neuropharmacol. 2011;34(4):139–140. doi:10.1097/WNF.0b013e318223421f
[35] Fornaro M. Switching from serotonin reuptake inhibitors to agomelatine in patients with refractory obsessive-compulsive disorder: a 3 month follow-up case series. Ann Gen Psychiatry. 2011;10(1):5. doi:10.1186/1744-859x-10-5.
[36] Altemus M, Pigott T, Kalogeras KT, et al. Abnormalities in the regulation of vasopressin and corticotropin releasing factor secretion in obsessive-compulsive disorder. Arch Gen Psychiatry. 1992;49(1):9–20.
[37] Bigos KL, Folan MM, Jones MR, et al. Dysregulation of neurosteroids in obsessive compulsive disorder. J Psychiatr Res. 2009;43(4):442–445. doi:10.1016/j.jpsychires.2008.04.007.
[38] Monteleone P, Catapano F, Del Buono G, et al. Circadian rhythms of melatonin, cortisol and prolactin in patients with obsessive-compulsive disorder. Acta Psychiatr Scand. 1994;89(6):411–415.
[39] Mukhopadhyay S, Fineberg NA, Drummond LM, et al. Delayed sleep phase in severe obsessive-compulsive disorder: a systematic case-report survey. CNS Spectr. 2008;13(5):406–413.
[40] Turner J, Drummond LM, Mukhopadhyay S, et al. A prospective study of delayed sleep phase syndrome in patients with severe resistant obsessive-compulsive disorder. World Psychiatry. 2007;6(2):108–111.
[41] American Psychiatric Association, & American Psychiatric Association. Task Force on DSM-IV. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. 4th ed. Washington, DC: American Psychiatric Association; 2000.
[42] Koran LM, Hanna GL, Hollander E, et al. Practice guideline for the treatment of patients with obsessive-compulsive disorder. Am J Psychiatry. 2007;164(7 Suppl):5–53.
[43] Goodman WK, Price LH, Rasmussen SA, et al. The Yale-Brown Obsessive Compulsive Scale. I. Development, use, and reliability. Arch Gen Psychiatry. 1989;46(11):1006–1011.
[44] Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry. 1960;23:56–62.
[45] Hamilton M. The assessment of anxiety states by rating. Br J Med Psychol. 1959;32(1):50–55.
[46] Vahip S, Kesebir S, Alkan M, et al. Affective temperaments in clinically-well subjects in Turkey: initial psychometric data on the TEMPS-A. J Affect Disord. 2005;85(1–2):113–125. doi:10.1016/j.jad.2003.10.011.
[47] Horne JA, Ostberg O. A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. Int J Chronobiol. 1976;4(2):97–110.
[48] Agargun MY, Cilli AS, Boysan M, et al. Turkish version of morningness-eveningness questionnaire (MEQ). Sleep Hypn. 2007;9(1):16.
[49] Timpano KR, Rubenstein LM, Murphy DL. Phenomenological features and clinical impact of affective disorders in OCD: a focus on the bipolar disorder and OCD connection. Depress Anxiety. 2012;29(3):226–233. doi:10.1002/da.20908.
[50] Murphy DL, Timpano KR, Wheaton MG, et al. Obsessive-compulsive disorder and its related disorders: a reappraisal of obsessive-compulsive spectrum concepts. Dialogues Clin Neurosci. 2010;12(2):131–148.
[51] Murphy DL, Moya PR, Fox MA, et al. Anxiety and affective disorder comorbidity related to serotonin and other neurotransmitter systems: obsessive-compulsive disorder as an example of overlapping clinical and genetic heterogeneity. Philos Trans R Soc Lond B Biol Sci. 2013;368(1615):20120435. doi:10.1098/rstb.2012.0435.
[52] Hecht H, van Calker D, Spraul G, et al. Premorbid personality in patients with uni- and bipolar affective disorders and controls: assessment by the biographical personality interview (BPI). Eur Arch Psychiatry Clin Neurosci. 1997;247(1):23–30.
[53] Kesebir S, Vahip S, Akdeniz F, et al. The relationship of affective temperament and clinical features in bipolar disorder. Turk Psikiyatri Derg. 2005;16(3):164–169.
[54] Coles ME, Schubert JR, Sharkey KM. Delayed bedtimes and obsessive-compulsive symptoms. Behav Sleep Med. 2012;10(4):258–265. doi:10.1080/15402002.2011.634939.