Psychiatria Danubina, 2019; Vol. 31, No.1, pp 106-110 https://doi.org/10.24869/psyd.2019.106 *Brief report*

AFFECTIVE TEMPERAMENT AND SEASONALITY IN BIPOLAR DISORDER

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SUMMARY

Background: *Both affective temperaments and seasonality impact on the illness course in bipolar disorder (BD). This exploratory study aims to investigate the link between seasonality and affective temperament in BD.*

Subjects and methods: *Sixty-six euthymic patients with BD-I were recruited. The Seasonal Pattern Assessment Questionnaire (SPAQ) and Temperament Evaluation Memphis, Pisa, Paris and San Diego-Autoquestionnaire version scale (TEMPS-A) were applied.*

Results: *The seasonal BD rate was 39.4% (n=26). Depressive and anxious temperament scores were higher in patients with seasonality. The SPAQ total scores were also associated with depressive, cyclothymic, and anxious affective temperament scores.*

Conclusion: *Our findings warrant further investigation to understanding the complex interaction between seasonality, mood regulation, and temperament collectively moderating illness course in BD. This study implies that affective temperament may have some value in discerning the link between seasonality and illness course in BD.*

Key words: *affective temperament - seasonality - bipolar disorder*

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INTRODUCTION

Illness course is often heteregenous in bipolar disorder (BD). The Descriptive and Statistical Manual of Mental Disorders fifth edition (DSM-5) offers several clinical specifiers for BD that may impact on the clinical course of illness: mixity, seasonality, and suicidality. Several studies, highlighting the importance of seasonality in BD, show a disturbed chronobiological rhythm during both acute episodes and inter-episodic periods (Geoffroy et al. 2014). Seasonal symptoms (syndromal and subsyndromal) were observed in about one-fifth of patients with BD (Melrose 2015, Pjrek et al. 2016). Numerous studies investigating the pattern of seasonal symptoms demonstrate that manic relapse is much more common in spring and summer, whereas depressive symptoms reach to a peak in early winter (Geoffroy et al. 2014). Few studies exploring the role of seasonality in mixed episode based on the previous DSM definition found a peak in spring and summer (Lee et al. 2007, Yang et al. 2013). There was also reported significant seasonal variations of symptoms such as cognitive functions, psychosis, aggressiveness and suicidality in bipolar patients (Geoffroy et al. 2014). Overall, abundant evidence from different geographical regions implies that seasonal pattern may be linked to a more severe illness course including earlier age at onset, more mood episodes, rapid cycles among patients with BD (Geoffroy et al. 2014).

Affective temperament is strongly associated with mood disorders, particularly BD, with a significant impact on illness course (Solmi et al. 2016). Hyperthymic temperament might be protective against suicide (Vazquez et al. 2010), whereas irritable and cyclothymic temperaments were associated with worse functioning (Walsh et al. 2012).

Moreover, in a recent study, affective temperament, chronotype and specific circadian gene polimorphisms were found to be associated in a non-clinical sample (Jankowski & Dmitrzak-Weglarz 2017). In this regard, incorporating findings, we hypothesized that seasonality and affective temperament, both acting as determinants for illness course in BD, would be associated. Therefore, this exploratory study aimed to investigate whether there was an association between affective temperament scores and seasonality in patients with BD-I.

SUBJECTS AND METHODS

Study Population

Sixty-six patients with BD-I, followed at Rasit Tahsin Mood Disorders Outpatient Unit of Bakırköy Research and Training Hospital for Psychiatry, Neurology, Neurosurgery, were recruited consecutively. The diagnosis was confirmed by two separate clinicians conducting DSM-IV-based interviews and evaluating

standardized medical records that have been in use at SKIP-TURK (a nation-wide mood disorders follow-up program) (Tırpan et al. 2004). Patients were euthymic with total scores of Young Mania Rating Scale (YMRS) and 17 items Hamilton Depression Rating Scale (HAM-D) below 7. Exclusion criteria were: age above 18 or below 65 years, illiteracy, current diagnoses of alcohol and substance use disorder, mental retardation, dementia, and decline in cognitive functioning that can impair understanding of the self-rated scales. The Medical Ethics Committee of Bakırköy Research and Training Hospital for Psychiatry, Neurology, and Neurosurgery approved the study protocol, and the study was carried out in accordance with the Declaration of Helsinki. Written informed consent was obtained from all the participants prior to enrollment.

Assessment Tools

Demographic data and health information were collected by a self-administered survey which was developed by the researchers. Each patient's clinical features and treatment history of BD were also evaluated. Patients were evaluated for seasonality using the Seasonal Pattern Assessment Questionnaire (SPAQ) (Noyan et al. 2000) and affective temperamental features using the Temperament Evaluation Memphis, Pisa, Paris and San Diego-Autoquestionnaire version scale (Vahip et al. 2005).

Statistics

STATA version 12.0 (STATA Corporation, College Station, TX, USA) was used to carry out the statistical analyses. Both visual (probability plot and histogram) analytical approaches (Shapiro-Wilk test) were applied to ascertain normality. T test and Chi-square test were used to compare demographic and illness characteristics between groups. As the sample size was small and the distributions were skewed, we cautiously applied the distribution-free method of bootstrapping to each regression analysis (n=10.000) analyzing associations between seasonality (SPAQ score) and affective temperaments (TEMPS-A scores). Analyses were also adjusted for age, sex, and age of onset. Statistical significance was set at $p<0.05$.

Table 1. Sample characteristics

	Total (N=66)	Seasonal (n=26)	Non-seasonal (n=40)	Test statistic	p
Gender[a], n(%)					
Female	42 (63.6)	15(57.7)	27(67.5)	0.65	0.42
Male	24 (36.4)	11(42.3)	13(37.5)		
Education[a], n(%)					
Primary	29 (43.9)	8 (30.8)	21 (52.5)		
High school	22 (33.3)	12 (46.2)	10 (25.0)	3.81	0.15
University	15 (22.7)	6 (23.1)	9 (22.5)		
Index episode[a], n(%)					
Hypomania/Mania	31 (47.0)	11 (42.3)	20 (50.0)		
Depression	21 (31.8)	10 (38.5)	11 (27.5)	0.87	0.65
Unidentified	14 (21.2)	5 (19.2)	9 (22.5)		
Treatmenta, n(%)					
Li/VPA/Li+VPA	22 (33.3)	7 (26.9)	15 (37.5)		
Li+SGA	18 (27.3)	6 (23.1)	12 (30.0)		
Lİ+VPA+SGA	13 (19.7)	6 (23.1)	7 (17.5)	10.6	0.22
VPA+SGA	6 (9.1)	5 (19.2)	1 (2.5)		
Other	7 (10.6)	2 (7.7)	5 (12.5)		
Age[b], Mean(SD)	34.7 (8.3)	33.2 (8.4)	35.6 (8.2)	0.12	0.91
Age at onset[b], Mean(SD)	23.3 (7.5)	22.2 (9.4)	24.1 (6.1)	0.71	0.48
Illness duration[b], Mean(SD)	12.6 (6.5)	12.6 (6.9)	12.7 (6.2)	0.53	0.60
The SPAQ score[b], Mean(SD)	9.7 (4.7)	14.1 (2.4)	6.9 (3.4)	4.51	<0.001
Temperament[c], Mdn. (Min-Max)					
Depressive	6.0 (0-18)	7.0 (2-16)	6.0 (0-18)	2.24	0.02*
Cyclothymic	6.0 (0-18)	8.5 (0-18)	6.0 (0-14)	1.22	0.22
Hyperthymic	8.0 (1-18)	8.5 (2-17)	8.0 (1-18)	0.16	0.87
Irritable	4.0 (0-16)	4.5 (0-16)	3.0 (0-16)	0.06	0.95
Anxious	5.0 (0-21)	6.5 (0-19)	5.0 (0-21)	2.18	0.03*

[a] χ^2 test; [b] T test; [c] Mann-Whitney-U test: *p<0.05 is statistically significant; Li:- lithium; VPA:- Valproate; SGA - Second Generation Antipsychotic; Mdn – Median; SD - Standard Deviation; SPAQ - Seasonal Pattern Assessment Questionnaire

Table 2. Associations between temperament dimensions and seasonality

	B	Bootstrap SE	95% CI	p-value	B*	Bootstrap SE	95% CI	p-value
Depressive	0.29	0.10	0.10; 0.49	0.003	0.33	0.14	0.05; 0.61	0.019
Anxious	0.28	0.09	0.10; 0.46	0.002	0.27	0.12	0.03; 0.51	0.029

CI =Confidence Interval; B=Regression Co-efficient; SE=Standard Error; *Adjusted for age, sex, and age of onset

RESULTS

Table 1 summarizes sample characteristics. Twenty-six patients (39.4%) had higher scores than the SPAQ cut-off. There was no statistically significant difference between patients with and without seasonality in terms of gender, age, education level, age at onset, index episode, and illness duration. None of the patients had a rapid cycling illness course. Depressive and anxious temperament scores were higher in patients with seasonality (Table 1). Regression models were provided in Table 2. Regression models revealed that the SPAQ total scores were associated with depressive and axious temperament scores but not with those of irritable, cyclothymic and hyperthymic.

DISCUSSION

The main findings of this explorative study were: (i) Depressive and anxious temperament scores were significantly higher in patients with seasonal features; (ii) the SPAQ total scores were associated with the following affective temperament subtypes: cyclothymic, depressive, and anxious.

To our knowledge, this is the first study investigating the relation between affective temperament subtypes and seasonality, and therefore, requires replication in larger samples with a longitudinal design. Further, there is some evidence that the low sensitivity of the SPAQ cut-off score may result in exclusion of some cases (Mersch et al. 2014). Therefore, we also explored the relation between the continuous SPAQ total scores and cyclothymic affective temperament scores.

Previous work on defining particular characteristics of seasonal affective disorders (SAD), in relation to temperament and personality dimensions, reported discrepant findings. Using NEO (neuroticism, extroversion, openness to the experience) personality inventory, Bagby and colleagues reported higher Openness scores in patients with SAD than in those with non-SAD (Bagby et al. 1996). They also indicated this distinct group of patients as more imaginative, more emotionally sensitive and likely to entertain unconventional (Bagby et al. 1996). Another study, likewise, demonstrated that patients with seasonal depression had different temperament profiles than nonseasonal patients (e.g. lower scores on neuroticism-related symptoms), while non-seasonal depressive patients had much more extreme temperament features including trait anxiety and hostility (Pendse et al. 1999). In contrast, Gordon and colleagues (1999) failed to find a significant relationship between neuroticism, depression severity, and seasonality. Inconsistency in findings could be partly related with the broad definition of neuroticism as an approximation of experiencing mixed negative emotions that involve sadness, guilt, fear, anger, embarresment, sadness, impulsivity, and anxiety. Harm Avoidance (HA), one of the most studied temperament subtype, also refers to anticipatory worry, pessimism, intolerance to uncertainty in a narrow concept (Goel et al. 2003; Maeno et al. 2005). HA was associated with mood regulation and with seasonality (Goel et al. 2003, Chotai et al. 2004). In addition, high self-transcendence (ST) and high persistence (PS) were also correlated with the seasonal variation as measured by the SPAQ (Chotai et al. 2004).

Given the extent of agreement between the TEMPS-A and the TCI-depressive, cyclothymic, anxious affective temperament subtypes were associated with HA; hyperthymic temperament with persistence (Rozsa et al. 2008). it is plausible to argue that our findings showing and association between the seasonality scores and the temperament scores (cyclothymic, depressive and anxious) might be in line with previous data (Rozsa et al. 2008, MacDonald et al. 2013). However, the variation in assessment tools using different definitions for measuring personality and temperament characteristics increases heterogeneity and precludes a comprehensive interpretation.

The social zeitgeber theory provides the framework to understand the dynamic interplay between mood symptoms and seasonal elements (Grandin et al. 2006). A growing body of evidence indicates affective temperament is strongly related to circadian activity and exposure to bright light (Goel et al. 2003, Rihmer et al. 2011). Accordingly, our findings also fall in the same direction - cyclothymic, depressive and anxious temperament scores were associated with the SPAQ scores. In this regard, we previously reported that temperamental dimensions constitute a vulnerability factor for the seasonal influence in a study investigating metabolic syndrome prevalence across affective temperament profiles (Altinbas et al. 2013). On the other hand, the SPAQ scores were associated with neither irritable nor hyperthymic temperament scores in the current study. It should be noted both hyperthymic and irritable temperament subtypes in particular have been linked to bipolar disorder (Solmi et al. 2016). Therefore, the lack of significance with these temperament subtypes in the current study might be explained by the size and the degree of homogeneity of the study

sample comprising only patients with BD-I - resulting in a floor effect. Besides, predominance of the episode type should be considered as another limitation of our study considering the relationship between specific temperament type and the illness course since we did not include it to the statistical analysis. On the other hand, the sensitivity of the SPAQ is quite low that should be noted as an another limitation of the study.

CONCLUSION

This pilot investigation implies that temperamental characteristics may have some value in discerning the link between seasonality and BD. There is some evidence that the putative neurobiological mechanisms of seasonality, mood regulation, and temperament may be explained with shared molecular pathways and neurotransmitter systems underlying similar genetic background (Roecklein et al. 2013, Melrose et al. 2015). Our findings warrant further investigation to understanding the complex interaction between seasonality, mood regulation, and temperament collectively moderating illness course in BD.

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Contribution of individual authors:

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CATEGORY 2

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