Research report

Temperamental dimensions of the TEMPS-A in females with co-morbid bipolar disorder and bulimia

Janusz K. Rybakowski [a,*], Katarzyna Kaminska [a], Jolanta Charytonik [b], Kareen K. Akiskal [c,d], Hagop S. Akiskal [c,d]

[a] Department of Adult Psychiatry, Poznan University of Medical Sciences, ul.Szpitalna 27/33, 60-572 Poznan, Poland
[b] Institute of Psychology, Adam Mickiewicz University, Poznan, Poland
[c] International Mood Center, Paris, France
[d] International Mood Center, La Jolla, CA, USA

ARTICLE INFO

ABSTRACT

Objectives: We investigated the effect of co-morbid bipolar disorder and bulimia on temperamental dimensions measured by TEMPS-A, relative to "pure" bulimia and "pure" bipolar disorder, in female patients.
Methods: The study was performed on 47 patients with bipolar disorder (BD) with a mean age of 36 ± 10 years, 96 patients with bulimia or bulimic type of anorexia, mean age 26 ± 9 years and 50 control healthy females (HC), mean age 29 ± 6 years. Among bulimic patients, a group of 68 subjects with co-morbid bulimia with bipolarity (BD+B) was identified, based on positive score of the Mood Disorder Questionnaire (MDQ). The TEMPS-A questionnaire, 110 questions version, has been used, evaluating five temperament domains: depressive, cyclothymic, hyperthymic, irritable and anxious. Parametric analysis was performed for 4 groups (BD, "pure" bulimia (PB), BD+B and HC), with 28 subjects randomly chosen from each group, using analysis of variance and cluster analysis.
Results: All clinical groups significantly differed from control group by having higher scores of depressive, cyclothymic, irritable and anxious temperaments and lower of hyperthymic one. Among patients, significantly higher scores of cyclothymic and irritable temperaments were found in BD+B compared to both PB and BD. These differences were also reflected in cluster analysis, where two clusters were identified.
Limitations: Bipolarity in bulimic patients assessed only by the MDQ.
Conclusions: These results show that co-morbid bulimia and bipolar disorder is characterized by extreme dimensions of both cyclothymic and irritable temperaments, significantly higher than each single diagnosis. Possible clinical implications of such fact are discussed.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

The TEMPS-A (Temperament Scale of Memphis, Pisa, Paris and San Diego – Autoquestionnaire) has been introduced by Akiskal et al. (2005). This scale measures five temperaments: depressive, cyclothymic, hyperthymic, irritable and anxious. The tool has been verified in 32 language versions and has been widely used in a number of epidemiological and clinical studies with psychiatric patients and healthy subjects. In Poland, the scale has been validated in a group of 521 Polish college students (Borkowska et al., 2010).

Significant differences in affective temperamental scores were demonstrated between patients with bipolar disorder (BD), their healthy relatives and healthy control subjects (HC). Mendlowicz et al. (2005) found higher scores of cyclothymic temperament in BD compared to their healthy relatives and HC. On the other hand, hyperthymic temperament was higher in HC. Vázquez et al. (2008) found significantly higher scores on all TEMPS-A subscales except for hyperthymia in BD patients compared to their healthy relatives. This was corroborated by a recent study of Mahon et al., 2013, including 55 discordant sibling pairs (one of each with BD) and 113 healthy controls, where BD patients scored significantly higher than control subjects on all but one subscale (hyperthymic) of the TEMPS-A. Among patients with BD, higher scores of the depressive, cyclothymic, irritable and anxious temperaments were found in patients with mixed episodes (Rottig et al., 2007).

A number of studies have described a co-morbidity of BD and eating disorders. In their review, McElroy et al. (2005) point on the evident relationship between bipolar II disorder and bulimia. An association between bipolar disorder and bulimia nervosa was also observed in Norwegian study (Lunde et al., 2009). In recent

---

Japanese study, using Mood Disorder Questionnaire (Hirschfeld et al., 2000) for detecting bipolar disorder, 1/5 of female patients with eating disorder fulfilled criteria for bipolar II disorder (Nagata et al., 2013).

The studies on specific affective temperament in patients with eating disorders are scarce. Ramacciotti et al. (2004) using a precursor of the TEMPS-A scale (TEMPS-I) found that people with binge eating displayed higher level of cyclothymic temperament than the normal population. Perugi et al. (2006), finding a 17.8% prevalence of bulimia in patients with atypical depression noticed that bulimic patients had significantly higher scores of cyclothymic temperament.

We were interested whether patients with co-morbid bipolar disorder and bulimia show differences in temperamental dimensions compared to "pure" BD patients as well to "pure" bulimics. Therefore, the aim of the study was to investigate the effect of co-morbid bipolar disorder and bulimia on temperamental dimensions measured by the TEMPS-A, relative to "pure" bulimia and "pure" bipolar disorder, in female patients.

2. Subjects and methods

2.1. Patients

The study was performed on 47 patients with bipolar mood disorder (BD), bipolar I – 16 patients, bipolar II – 31 patients, 96 patients with bulimia or bulimic type of anorexia, and 50 healthy females. Consensus diagnosis by at least two psychiatrists was made for each patient, according to DSM-IV criteria (SCID) (First et al., 1996). Psychosocial characteristics of these subjects are given in Table 1.

Bipolar patients were older compared with the remaining groups. Patients with bulimia or bulimic type of anorexia had less years of education, were less frequently employed and married compared with bipolar patients and control group.

Among bulimic patients, a group of 68 co-morbid bulimia with bipolarity was identified based on a positive score (≥ 7 points) on the Mood Disorder Questionnaire (MDQ).

The TEMPS-A questionnaire, 110 questions, version has been used. The evaluation of five temperament domains: depressive (items 1–21), cyclothymic (items 22–42), hyperthymic (items 43–63), irritable (items 64–84) and anxious (items 85–110) was performed. The scoring for each scale was calculated using the mathematical rule: sum of scoring of the variables belonged to such category/ number of variables (nv): $(v_1 + v_2 + v_3 + \cdots + v_x)/nv$.

The study was approved by the Bioethics Committee, Poznan University of Medical Sciences and all patients gave their informed consent after the nature of the procedures had been fully explained to them.

2.2. Statistical methods

Four groups of subjects were included in statistical analysis: 1) patients with BD (47 subjects); 2) patients with co-morbid BD and bulimia (BD+B) (68 subjects); 3) patients with pure bulimia (PB) (28 subjects); and 4) healthy control persons (HC) (50 subjects). To perform parametric analysis, 28 subjects were randomly chosen from each group using for this purpose a table of random numbers (Brzezinski, 2007). Finally, the data for analysis consisted of 112 women (28 from each group).

Statistical analyzes were performed by the IBM SPSS Statistics, version 21. The differences between groups were examined using one-way analysis of variance (ANOVA) with contrasts. Distribution of frequencies based on the analysis of the two variables was tested by performing cross-comparison tables. To assess temperament structures, k-means cluster analysis was performed. Statistical significance was set at $p < 0.05$.

3. Results

3.1. The scores for five temperaments in the groups studied

The scores of affective temperaments of the TEMPS-A in four groups studied are presented in Table 2. To determine the direction of the difference, the contrasts analysis was performed. Contrast 1: comparing the control group with the other groups; contrast 2: comparing co-morbid bipolar and bulimia with bipolar group and pure bulimic group; contract 3: comparing pure bulimia group with bipolar group.

The control healthy group received significantly lower score than the other groups on the temperament scales: depressive, $t(108) = 4.40$, $p < 0.001$, cyclothymic $t(107) = 5.63$, $p < 0.001$, irritable $t(108) = 3.91$, $p < 0.001$ and anxious, $t(108) = 5.77$, $p < 0.001$, and also significantly higher score on hyperthymic temperament, $t(108) = 4.63$, $p < 0.001$.

Subject with co-morbid BD and bulimia had significantly higher score than those with pure bulimia and those with bipolar disorder on scales on cyclothymic $t(107) = 3.70$, $p < 0.001$ and irritable temperament $t(108) = 3.20$, $p < 0.01$. There were no statistically significant differences between groups of bipolar disorder and pure bulimia on all five dimensions of the TEMPS-A.

Table 1
Psychosocial characteristics of subjects studied.

Group	Bipolar disorder $N=47$	Bulimia or bulimic anorexia $N=96$	Control subjects $N=50$
Age (years) mean $\pm$ SD	36 ± 11	28 ± 9	29 ± 6
% education > 13 years	40	18	28
% employed	80	26	88
% married/concubine	26	12	28

Table 2
The scores of affective temperaments of the TEMPS-A in four groups studied (The values are given as mean $\pm$ SD).

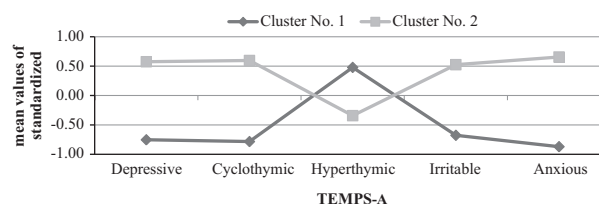| Group	Temperament				
	Depressive	Cyclothymic	Hyperthymic	Irritable	Anxious
HC	$0.34 \pm 0.19^{\#}$	$0.33 \pm 0.21^{\#}$	$0.51 \pm 0.22^{\#}$	$0.20 \pm 0.17^{\#}$	$0.26 \pm 0.18^{\#}$
PB	0.56 ± 0.23	0.54 ± 0.22	0.30 ± 0.17	0.32 ± 0.22	0.51 ± 0.19
BD+B	0.54 ± 0.20	$0.73 \pm 0.19^{**}$	0.32 ± 0.19	$0.44 \pm 0.13^{*}$	0.59 ± 0.21
BD	0.55 ± 0.24	0.53 ± 0.26	0.29 ± 0.22	0.29 ± 0.19	0.49 ± 0.25
F(3, 108)	6.49	15.18	7.30	8.67	12.33
p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

HC – healthy controls; PB – pure bulimia; BD+B – co-morbid bipolar disorder and bulimia; BD – bipolar disorder.
#Difference between BD+B and both PB and BD significant, $p < 0.001$.
Difference between healthy controls vs all other groups significant, ** $p < 0.001$; * $p < 0.01$.

Fig. 1. k-means cluster analysis for four groups studied.