Research report

Affective temperaments in clinical practice: A validation study in mood disorders

P.A. Vöhringer [b,c,d], E.A. Whitham [b], S.B. Thommi [b], N.S. Holtzman [b], H. Khrad [b], S.N. Ghaemi [a,*]

[a] Mood Disorders Program, Tufts Medical Center, Professor of Psychiatry, Tufts University School of Medicine, Boston, MA, United States
[b] Mood Disorders Program, Department of Psychiatry, Tufts Medical Center, Boston, MA, United States
[c] Hospital Clínico, Facultad de Medicina, Universidad de Chile, Santiago, Chile
[d] Graduate Program, Clinical and Translational Science Institute (CTSI), Sackler School of Graduate Biomedical Sciences, Tufts University, Boston, MA, United States

ARTICLE INFO

ABSTRACT

Background: We sought to examine correlations between clinical validators and temperaments in clinical practice.
Methods: We provided the self-report TEMPS-A (50 item long) to 123 consecutive patients seen in the Mood Disorders Program of Tufts Medical Center. Temperament was assessed as cyclothymia, dysthymia, irritable or hyperthymia. Cut-offs were tested using (50%) and (75%) thresholds of affirmative responses, as well as highest percent for dominant temperament. We reported no dominant temperament at 75% cut-off . Multivariate regression modeling was conducted to assess confounding bias.
Results: Using clinical and demographic validators, cyclothymia was the most strongly validated temperament, followed by dysthymia and hyperthymia. Irritable temperament did not appear to be valid in this sample. A 75% item endorsement cut-off appeared to identify clinically important temperaments in slightly less than half of this sample. Those without any temperament at 75% cut-off had better prognostic features. 50% cut-off was highly nonspecific, and poorly correlated with diagnostic validators.
Conclusions: Affective temperaments correlate with clinical validators, most robustly for cyclothymia. 75% cut-off on the TEMPS may provide a useful categorical definition of abnormal affective temperaments in mood disorders. With that definition, slightly less than one-half of patients with mood disorders have affective temperaments. Those without abnormal affective temperaments have better prognostic features.

© 2011 Elsevier B.V. All rights reserved.

1. Introduction

Temperament has been closely linked to mood disorders (Akiskal, 2000). Establishing which treatments are effective for patients with varying temperaments could provide a useful basis for assessing treatment options (Henry et al., 1999). The practical utility and scientific validity of assessing temperament in mood disorders has been questioned (Paris et al., 2007). Most previous studies assessing temperament involved lengthy scales, administered in research settings (Akiskal et al., 2005a; Akiskal et al., 1998). A 50 item self-report short version of the Temperament Scale of Memphis, Pisa, Paris and San Diego-Autoquestionnaire (TEMPS-A) was developed to enhance clinical utility. This instrument measures dysthymia, cyclothymia, hyperthymia, and irritable temperaments (Akiskal et al., 2005b).

Previous studies with the TEMPS-A have mainly assessed its psychometric properties within research samples. Few, if any, studies have assessed its clinical validity in non-research samples. In this paper, we sought to assess the construct validity and practical clinical utility of temperament

* Corresponding author at: Tufts Medical Center, 800 Washington St., Boston, MA 02111, United States. Tel.: + 1 617 636 5735; fax: + 1 617 636 7795.
E-mail address: nghaemi@tuftsmedicalcenter.org (S.N. Ghaemi).

assessment for mood disorders among clinical psychiatric out-patients.

2. Methods

2.1. Subjects

Patient records from June 2008–May 2010 were obtained from 123 consecutive patients (mean age 38.0 ± 14.0 years) seen for clinical evaluation (consultation or new treatment) at the Mood Disorders Program at Tufts Medical Center following Tufts Institutional Review Board approval. In the routine intake process at this program DSM-IV criteria were systematically applied. Subjects filled out the short version self-questionnaire TEMPS-A (Akiskal et al., 2005b) and were treated as per standard of care.

Demographic data (race, marital status, employment status, and living alone) and clinical factors (previous hospitalizations, previous suicide attempts, history of trauma, family history of psychiatric illness, antidepressant induced mania) were assessed at baseline interview. Diagnostic frequency was 62% BD Type I, 12% BD Type II, 11% BD NOS, 7% MDD, 7% other (e.g., schizoaffective disorder, adjustment disorders, or pure dysthymia).

Past antidepressant-induced mania was identified when it had unequivocally occurred in direct relation to a new trial of an antidepressant. Where such data was not clear based on history ($n = 36$), antidepressant-induced mania was deemed to be absent. Using this method, past antidepressant-induced mania was defined as present in 21% (15/71) of subjects who had received antidepressants previously.

The questionnaires and initial demographic and diagnostic data were generally collected at the subjects' initial visit to the Mood Disorders Program. The following information was collected: history of substance abuse, number of previous hospitalizations and/or suicide attempts, family history of psychiatric illness, past sexual/physical trauma, current or past psychosis, past antidepressant use, past antidepressant induced mania, current rapid-cycling status, Clinical Global Impression (CGI scores) (Spearing et al., 1997), and demographic data.

2.2. Rating scales

The 50 item short-version TEMPS-A was used to evaluate cyclothymic, dysthymic, irritable, and hyperthymic temperaments (Akiskal et al., 2005b). Of the 50 true/false questions, affirmative "true" responses were counted toward each temperament: 9 to dysthymic, 11 to irritable, 17 to cyclothymic and 13 to hyperthymic. Patients were instructed verbally and in writing to answer true for statements that described them for much of their lives. Questions left blank were counted as affirmative answers.

To assess construct validity we then tested multiple thresholds: specifically, meeting 50% or more, and 75% or more affirmative responses for any temperament item category. The design was not exclusive; patients who met multiple thresholds were included in the statistical analysis for each temperament. We also assessed the "dominant" temperament, defined as the temperament with the highest percentage of items endorsed.

2.3. Statistical analysis

Statistical analyses were carried out using JMP software (SAS Institute Inc., Cary, NC) and STATA (StataCorp LP, College Station, TX). Univariate analyses were followed by multivariate regression modeling to correct for clinical and demographic confounding bias.

3. Results

Table 1 provides clinical and demographic characteristics of the sample, and Table 2 provides the primary results of associations with temperaments.

Temperament items most frequently endorsed were, in order, cyclothymia (61%), dysthymia (56%), hyperthymia (43%), and irritable (42%). As expected, dimensional assessment of number of items endorsed produced the most associations with clinical and demographic variables, with a decreasing number of associations as increasingly stringent temperament definitions were used. Using the cut-off of those endorsing $\geq 50\%$ of items, almost all subjects (93%) met criteria for affective temperaments (usually more than one, mean 2.1 ± 1.0 temperaments), while the cutoff of $\geq 75\%$ of items (75-temp), divided the sample into slightly more than half with (53%) or without (47%) an affective temperament.

Using the raw number of items endorsed, all temperaments were associated with clinical outcomes, as was the case with the 50-temp criterion (except for dysthymia). With the 75-temp criterion, cyclothymia and hyperthymia were most strongly associated with clinical validating features. The absence of any temperament at the 75-temp criterion was strongly associated with good clinical and demographic indicators.

Using the 75-temp criterion, 30% of patients met criteria for more than one temperament. When dominant temperament was assessed, the most common was cyclothymia (40%), followed by hyperthymia (30%), dysthymia (20%), and irritable (15%). 65% of the sample had no dominant temperament using the 75-temp cut-off. In 19 subjects, two temperaments had similar percentage of items endorsed, but in all cases, cyclothymia was one of the two temperaments involved; we identified cyclothymia as the most consistent dominant temperament in those cases.

Table 1
Demographic and clinical characteristics of the sample ($n = 123$).

Category	Frequency
Gender	
Male	42%
Female	58%
Race	
White	85%
Marital status	
Married	29%
Divorced	17%
Single	53%
Widowed	1%
Living alone	29%
Previous hospitalizations	46%
Previous suicide attempts	38%
Family history of psychiatric illness	80%
Past sexual/physical trauma	18%

Table 2
Distribution and associations between temperaments and clinical features.

Clinical indicator	Temperament				
	Cyclothymia	Dysthymia	Hyperthymia	Irritable	No temperament assigned
Mean % of items endorsed in the whole sample (±SD)	61.2 ± 25.3	56.1 ± 21.4	43.4 ± 25.2	42.3 ± 26.4	48.3 ± 24.2**
% of subjects assigned to each category (50% cutoff)	70%	66%	50%	38%	9%
% of subjects assigned to each category (75% cutoff)	40%	22%	30%	15%	65%
% of subjects assigned to each category using dominant temperament (75% cutoff)†	16%	8%	9%	2%	65%
Associated clinical features using the dominant temperament (75% cut off)*	Rapid cycling (+)	Current substance abuse (+)	Number suicidal attempts (+)	Current substance abuse (+)	Employed (+)
	More than 20 depr. episode (+)	More than 20 depr. episode (+)	Past suicidality (+)	Past hospitalizations (+)	Female (−)
	Atypical depress features (+)	Employed (−)	First diagnosis MDD (−)	Use MS (−)	CGI overall (−)
	Years with AD (+)				More than 20 depr. episode (−)
					More than 20 manic. episode (−)

CGI = Clinical Global Impression scale. AD = antidepressants. MDD = major depressive disorder. MS = mood stabilizers. *All associations are based on multivariate regression analyses. (−) = Negative association (+) = Positive association. **Mean of affirmative responses in all temperament groups with patients who did not meet criteria for any temperaments using a 75% threshold. All associations are P<0.05, † mutually exclusive categories.

Irritable temperament seemed least consistently associated with clinical and demographic validators, with associations only at the 50-temp definition. At the 75-temp criterion, just 3 (2.4%) patients were defined as having irritable temperament by itself; it always co-presented with at least cyclothymia. Using the broad definition of number of items endorsed, irritable temperament was not associated with most clinical and demographic validators, once co-occurring cyclothymia was corrected in the regression model.

Among the positive multivariate associations in Table 2, cyclothymia was associated with clinical features of worse prognosis: >20 depressive episodes, more prior antidepressant use, rapid-cycling course, and atypical depression. Hyperthymia temperament was associated with more past suicidality, but less initial misdiagnosis with major depressive disorder. Dysthymic temperament was associated with current substance abuse, >20 depressive episodes, and being unemployed. Absence of any temperament was associated with being employed, being male, having lower CGI, and <20 depressive and manic episodes.

4. Discussion

This study applied the TEMPS scale to a clinical population to assess the validity of the scale and to study its utility in clinical practice. We found that a 75% item endorsement cut-off seemed to be a valid criterion. 50% item endorsement failed to differentiate those with and without these temperaments, and also led to the near-universal identification of multiple temperaments in the same subjects.

Among the temperaments, cyclothymia was best associated with clinical and demographic validators, followed by hyperthymia. Irritable temperament was not validated as an independent temperament with strong clinical or demographic associations.

We did not find previous literature on the characteristics of patients who do *not* meet criteria for any temperament. The TEMPS was developed as a dimensional measure, primarily; from that perspective, all persons would have some scores on this scale. However, for clinical uses, some categorization of abnormal temperaments is relevant, and, as with other dimensional conditions like hypertension or hypercholesterolemia, some clinically validated cut-offs for abnormal temperaments are helpful.

These results extend findings from previous studies. Our results agree with previous data associating cyclothymic temperament with type II bipolar disorder, (Akiskal et al., 2003; Handtouche et al., 1998), and associating dysthymic temperament with more depressive episodes in type I bipolar disorder (Henry et al., 1999).

In contrast to previous studies (Akiskal et al., 1977; Henry et al., 2001), our data indicate that hyperthymia, not cyclothymia, predicted more suicide attempts. Also, in contrast to a family medicine clinic based study which found hyperthymic temperament (33.3%) more prevalent than cyclothymic temperament (6.7%) (Cunningham et al., 2009), we found the reverse.

4.1. Clinical importance

These findings broaden our understanding of the relationship between temperament and illness, and the potential for influence on course of illness and outcomes in mood disorders. Screening for temperament among patients could help clinicians more accurately assess treatment options, as well as differentiate between groups of patients in research samples to examine treatment efficacy more precisely. Further

research is needed to examine larger samples with longer periods of follow up, to support more effective treatment guidelines and considerations. By identifying specific temperaments associated with treatment response or non-response, interventions can be developed to improve outcomes in mood disorders.

4.2. Limitations of the current study

This study has several limitations. Sample size was not as large as previous TEMPS validation studies, but those validation studies mainly assessed psychometric properties (test–retest reliability, construct validity compared to other scales), not clinical validators. This unfunded study provides initial data which might serve as a pilot basis for future research. The retrospective nature of our study may have led to inaccurate reporting of some of our measurements, and more prospective data would strengthen the findings. Additionally, this study was not blinded. The patient population was made up only of individuals in treatment in one clinic, with predominantly bipolar patients. Temperament was assessed at first clinical appointment, which generally occurred during a mood episode, while other similar studies reported temperament after recovery. The validity of the scale depending on mood state at the time of the assessment was not examined within this study. We were unable to assess associations with treatment outcomes.

5. Conclusions

Cyclothymia was the most strongly validated temperament, followed by hyperthymia, and then dysthymia. Irritable temperament did not appear to be valid in this sample. A 75% TEMPS item endorsement cut-off appears to identify clinically important temperaments in slightly more than half of this sample of patients with mood illnesses. Those without any of these temperaments (normal temperament) had better prognostic features.

References

Akiskal, H., 2000. Temperament and mood disorders. The Harvard Mental Health Letter 16, 5–6.

Akiskal, H., Djenderedjian, A., Rosenthal, R., Khani, M., 1977. Cyclothymic disorder: validating criteria for inclusion in the bipolar affective group. The American Journal of Psychiatry 134, 1227.

Akiskal, H.S., Placidi, G.F., Maremmani, I., Signoretta, S., Liguori, A., Gervasi, R., Mallya, G., Puzantian, V.R., 1998. TEMPS-I: delineating the most discriminant traits of the cyclothymic, depressive, hyperthymic and irritable temperaments in a nonpatient population. Journal of Affective Disorders 51, 7–19.

Akiskal, H.S., Hantouche, E.G., Allilaire, J.F., 2003. Bipolar II with and without cyclothymic temperament: "dark" and "sunny" expressions of soft bipolarity. Journal of Affective Disorders 73, 49–57.

Akiskal, H.S., Akiskal, K.K., Haykal, R.F., Manning, J.S., Connor, P.D., 2005a. TEMPS-A: progress towards validation of a self-rated clinical version of the Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego Autoquestionnaire. Journal of Affective Disorders 85, 3–16.

Akiskal, H.S., Mendlowicz, M.V., Jean-Louis, G., Rapaport, M.H., Kelsoe, J.R., Gillin, J.C., Smith, T.L., 2005b. TEMPS-A: validation of a short version of a self-rated instrument designed to measure variations in temperament. Journal of Affective Disorders 85, 45–52.

Cunningham, P.D., Connor, P.D., Manning, J.S., Stegbauer, C.C., Mynatt, S.L., 2009. Evaluation of mood disorder patients in a primary care practice: measures of affective temperament, mental health risk factors, and functional health in a retrospective, descriptive study of 35 patients. Primary Care Companion to the Journal of Clinical Psychiatry 11, 68–73.

Handtouche, E.D., Akiskal, H.S., Lancrenon, S., Allilaire, J.F., Sechter, D., Azorin, J.M., Bourgeois, M., Fraud, J.P., Châtenet-Duchêne, L., 1998. Systematic clinical methodology for validating bipolar-II disorder: data in mid-stream from a French national multi-site study (EPIDEP). Journal of Affective Disorders 50 (2–3), 163–673.

Henry, C., Lacoste, J., Bellivier, F., Verdoux, H., Bourgeois, M.L., Leboyer, M., 1999. Temperament in bipolar illness: impact on prognosis. Journal of Affective Disorders 56, 103–108.

Henry, C., Sorbara, F., Lacoste, J., Gindre, C., Leboyer, M., 2001. Antidepressant-induced mania in bipolar patients: identification of risk factors. The Journal of Clinical Psychiatry 62, 249–255.

Paris, J., Gunderson, J., Weinberg, I., 2007. The interface between borderline personality disorder and bipolar spectrum disorders. Comprehensive Psychiatry 48, 145–154.

Spearing, M., Post, R., Leverich, G., Brandt, D., Nolen, W., 1997. Modification of the Clinical Global Impressions (CGI) Scale for use in bipolar illness (BP): the CGI-BP. Psychiatry Research 73, 159–171.