Research report

Affective temperaments, as measured by TEMPS-A, among nonviolent suicide attempters

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Background: The aim of this study was to investigate the role of affective temperaments in suicidal behavior.

Method: Using the standardized Hungarian version of the full-scale 110-item version of the TEMPS-A autoquestionnaire we compared the affective temperament-profiles of 150 consecutively investigated nonviolent suicide attempters (106 females and 44 males) and 302 age, sex and education matched normal controls (216 females and 86 males).

Results: Compared to controls, both female and male suicide attempters scored significantly higher in the four of the five affective temperaments, containing more or less depressive component (depressive, cyclothymic, irritable and anxious). On the other hand, however, no significant difference between the suicide attempters and controls was found for the hyperthymic temperament. Significantly higher rate of suicide attempters (90.0%) than controls (21.5%) have had some kind of dominant (mean score+2SD or above) affective temperament. Compared to controls, depressive, cyclothymic, irritable and anxious temperaments were significantly more frequent and hyperthymic temperament was nonsignificantly less common among suicide attempters.

Conclusions: The findings support the strong relationship between depression and suicidal behavior even on temperamental level, and suggest that hyperthymic temperament does not have predisposing role for suicidal behavior at least in the case of nonviolent suicide attempters.

Limitation: As only nonviolent suicide attempters were studied, our findings should pertain only for this patient-population.

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Suicide attempters
Personality
Depression

1. Introduction

As suicidal behavior is a major public health problem its prediction and prevention receives more and more attention nowadays. Between 10 and 18% of adults report lifetime suicidal ideation and 3–5% have made at least one suicide attempt at some points in their life (Kessler et al., 1999; Szadoczky et al., 2000; Weissman et al., 1999). In spite of the fact that suicidal behaviour is very complex, multicausal human behaviour, over 90% of suicide victims and suicide

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attempters have at least one current major mental disorder and more than two-thirds of them have (mostly untreated) major depressive episode at the time of the suicidal act (Coryell and Young, 2005; Rihmer, 2007). The short-term risk of suicidal behavior is very high in the case of severe depression particularly in the presence of hopelessness, guilt and few reason for living (Coryell and Young, 2005; Hawton et al., 2005; Malone et al., 2000; Maser et al., 2002; Oquendo et al., 2004; Valtonen et al., 2005), which characteristics are strongly related to each other. Suicidal ideation/plan, the major precursors of attempted and completed suicide, that show high consistency across major depressive episodes (Rihmer, 2007; Sokero et al., 2006) and of course, recent suicide attempts are the most powerful predictors of the short-term risk of suicidal behavior (Coryell and Young, 2005; Hawton et al., 2005; Rihmer, 2007).

However, since unipolar and bipolar mood disorders are highly recurrent or chronic in their nature, prediction of suicidal behavior in mood disorder patients for long-term is also an important and challenging task for the clinician. Beside the recurrence (i.e., the new episode) of a given major mood disorder (Coryell and Young, 2005; Hawton et al., 2005; Rihmer, 2007), adverse life-situations and acute psycho-social stressors (Coryell and Young, 2005; Hawton et al., 2005; Rihmer, 2007; Sokero et al., 2005; Zouk et al., 2006) as well as some personality characteristics (Akiskal et al., 2003; Heisel et al., 2006; Kochman et al., 2005; Maser et al., 2002; Oquendo et al., 2004) seem to have the most important role. It has been repeatedly found that aggressive/impulsive personality features (Mann et al., 2005; Maser et al., 2002; Oquendo et al., 2004; Rihmer, 2007; Zouk et al., 2006), high neuroticism, low openness and impaired problem solving capacity (Heisel et al., 2006; Malone et al., 2000; Stankovic et al., 2006) increased the risk of both attempted and completed suicide. While “neuroticism” is a global construct which subsumes, among others, such traits as anxiousness, depressiveness, and mood lability (Akiskal et al., 2006; Eysenck, 1987; Miller and Pilkonis, 2006), the depressive, cyclothymic, hyperthymic, irritable and anxious subscales of the recently developed TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire version) (Akiskal et al., 2005a,b) more specifically and individually measure each of the foregoing trait dimensions.

In support of the clinical view of Kraepelin and Kretschmer, recent results strongly suggest that the specific different affective temperament types (depressive, cyclothymic, hyperthymic, irritable and anxious) are the subaffective (trait-related) manifestations and frequently the precursors of the major depressive and bipolar major mood disorders, playing also a significant role in the symptom-formation of the cross-sectional clinical picture (Akiskal, 1996; Akiskal and Pinto, 1999; Kochman et al., 2005). This raises the question whether the affective temperaments could serve as a long-term predictor of suicidal behavior.

In fact, most recent studies have demonstrated a strong relationship between some specific affective temperament-types and suicidal behavior. Compared to non-cyclothymic bipolar II patients (n=120) cyclothymic bipolar II subjects (n=74) reported significantly more frequently lifetime suicide attempts (38% vs 49%) and experienced more current hospitalization for suicidal risk (50% vs 61%), (Akiskal et al., 2003). During a 2–4 year prospective follow-up of 80 juvenile inpatients with current major depressive episode, cyclothymic-hypersensitive temperament at baseline significantly predicted the bipolar outcome and suicidal behavior during the follow-up (Kochman et al., 2005). In their study on 115 bipolar I or bipolar II patients Young et al. (1994/1995) found that bipolar (I+II) patients with lifetime history of cyclothymic disorder reported significantly higher mean number of prior suicide attempts than bipolar patients without cyclothymic disorder (0.30 vs 0.15). Investigating the depressive and hyperthymic temperament scores of 72 euthymic bipolar I patients, Henry et al. (1999) also reported that previous suicide attempts appeared significantly more frequently in the history of patients with high depressive temperament scores but this was not the case in patients with hyperthymic temperament. Pompili et al. (2008) investigated the affective temperament-profile of 150 consecutively hospitalized Italian psychiatric patients, 80% of them have had unipolar major depressive or bipolar I/II disorder, and 41% have had suicide risk at the admission. The authors found that the 62 suicidal psychiatric patients scored significantly higher on depressive, cyclothymic, irritable and anxious, and significantly lower on hyperthymic subscales of the TEMPS-A than the 88 non-suicidal ones (Pompili et al., 2008).

Investigating the personality profiles of 804 adults, representative for the US general population, Cloninger et al. (1998) found that the rates of prior suicide attempts and current depression were the highest among persons with cyclothymic and depressive personality types (8.2% and 6.9% and 9.7%, and 12.1% respectively), as derived from the Cloninger Temperament and Character Inventory.

While the studies, mentioned above, investigated the frequency of past suicidal behavior or the current suicide risk in relation to affective temperaments, both in mood disorder patients and in community samples, to our best knowledge the frequency and distribution of different affective temperament-types among suicide attempters has not been yet addressed.

2. Subjects and methods

The entire study population was a consecutively contacted and investigated series of 156 individuals who were admitted to the central “Suicide Emergence Unit” of Budapest (Department of Internal Medicine and Toxicology, Elizabeth Hospital and Outpatient Clinic, Budapest) because of their current nonviolent suicide attempt (drug overdose or poisoning). The subjects were interviewed (DSM-IV Axis I diagnoses and temperament-self evaluation see below) within 24–72 h after their admission, in most cases before they discharge, when they were in stable medical and mental conditions. A structured interview according to DSM-IV, the Mini International Neuropsychiatric Interview (Balazs et al., 1998; Sheehan et al., 1998) was administered to determine the current DSM-IV Axis I psychiatric diagnoses. The detailed description of the study procedure has been published previously (Rihmer et al., 2006). The Temperament Evaluation of the Memphis, Pisa, Paris and San Diego-Autoquestionnaire (TEMPS-A) is a new self-assessed temperament 110-item scale with depressive, cyclothymic, hyperthymic, irritable and anxious subscales requiring simple “yes” (score 1) or “no”
(score 0) answers (Akiskal et al., 2005a). To date, it has been translated into 25 languages and validated in 10, including Hungarian (Akiskal et al., 2005a; Rozsa et al., 2006, 2008). Previously we investigated the internal consistency and concurrent validity of the Hungarian version of TEMPS-A against the Beck Depression Inventory (BDI), Temperament and Character Inventory (TCI) and the NEO Personality Inventory-Revised (NEO-PI-R) in a normative sample of Hungarian healthy persons (n=1132, 16–81 years, mean: 28 year), and found that similarly to other language versions of the TEMPS-A the factorial structure of the TEMPS-A showed good reliability and internal consistency (Rozsa et al., 2008). By definition, hyperthymic temperament is free of depressive features and in contrast to this, depressive temperament does not contain any hyperthymic component. Cyclothymic and irritable temperaments are the successive and simultaneous mixture of hyperthymic and depressive features respectively, while the anxious temperament strongly relates to depressive temperament (Akiskal et al., 2005a,b; Rozsa et al., 2008). These 5 temperaments are not independent of each other: depressive and anxious temperament, and cyclothymic and irritable temperament are closely related and also show high correlation to all other scales. Hyperthymic temperament is the only one that appears independent from the others. The principal component analyses identified two superfactors: depressive, anxious, cyclothymic and irritable temperament loaded on the Factor I, and hyperthymic temperament correlated with Factor II (Akiskal et al., 2005a; Rozsa et al., 2008). The final sample consisted only of the 150 suicide attempters (106 females and 44 males; aged between 16 and 66, mean: 36.4 years, SD=12.9), who have completed the 110-item TEMPS-A. The majority of them (120/150=80%) have had DSM-IV current major depressive episode (91 unipolar depression, first episode and recurrent combined, 11 bipolar I and 18 bipolar II disorder, 62% of this 120 patients with current major depressive episode also had comorbid substance-related and/or anxiety disorders). Other current DSM-IV Axis I diagnoses were dysthymic disorder (n=2, 1%), substance-use disorders only (n=8, 5%), anxiety disorders only (n=3, 2%), psychotic disorder (n=2, 1%) while 15 subjects (10%) have had no current Axis I diagnosis. Ninety-three subjects (62%, 68 females and 25 males) were repeated attempters, and 35 of them (38%, 25 females and 10 males) have had 3 or more prior suicide attempts. The temperament scores of suicide attempters were compared with a group of sex, age, and education matched (normal) controls without any previous history of psychiatric disorders and psychiatric contact (216 females, 86 males, aged between 17 and 73, mean: 34.2 years, SD=15.9) drawn from our previously published normative sample (Rozsa et al., 2006, 2008). There were no statistically significant differences between the socio-demographic variables (sex, age, and highest education) compared the two samples (Table 1).

Each subjects included provided written informed consent after being fully informed of the goal and nature of the study that received ethics approval from the local ethics review board.

The statistical comparison was made by two-way ANOVA (groups: suicide attempters and controls, and sex: females and males) for continuous variables, and Chi-square statistics and estimate an odds ratio for categorial variables. Alpha-level was set at 5%. Statistical analysis was done with SPSS 10.0.

3. Results

Based on the two-way ANOVA we got four significant main group effect (depressive, cyclothymic, irritable and anxious) and three gender effects (depressive, cyclothymic and anxious). There were no significant interactions. Compared to controls, both female and male suicide attempters scored significantly higher (p<0.05) in the four of the five temperaments, containing more or less depressive component (depressive, cyclothymic, irritable and anxious). On the other hand, however, no significant difference between the suicide attempters and controls was found for the hyperthymic temperament scores (Table 2). Significantly higher rate of suicide attempters (90.0%) than controls (21.5%) have had some kind of dominant (mean score+2SD or above) affective temperament (χ²=190.49; p<0.001). Compared to controls,

Table 1
Socio-demographic characteristics of suicide attempters and age, sex and education matched controls

<table>
<thead>
<tr>
<th></th>
<th>Suicide attempters (n=150)</th>
<th>Controls (n=302)</th>
<th>Statistics (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70.6</td>
<td>71.5</td>
<td>0.62</td>
</tr>
<tr>
<td>Male</td>
<td>29.4</td>
<td>28.5</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>36.4</td>
<td>34.2</td>
<td>0.14</td>
</tr>
<tr>
<td>Highest education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%, number of classes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 or less</td>
<td>32.0</td>
<td>30.4</td>
<td>0.45</td>
</tr>
<tr>
<td>9–12</td>
<td>57.3</td>
<td>58.1</td>
<td></td>
</tr>
<tr>
<td>13 or more</td>
<td>10.6</td>
<td>11.5</td>
<td></td>
</tr>
</tbody>
</table>

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Table 2
Means, standard deviations and significant effects of TEMPS-A scores of suicide attempters and healthy controls

<table>
<thead>
<tr>
<th>Temperament</th>
<th>Suicide attempters (n=150)</th>
<th>Controls (n=302)</th>
<th>Sign. effects of two-way ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males (n=44)</td>
<td>Females (n=106)</td>
<td>Males (n=86)</td>
</tr>
<tr>
<td>Depressive</td>
<td>0.47 (0.17)</td>
<td>0.59 (0.19)</td>
<td>0.30 (0.15)</td>
</tr>
<tr>
<td>Cyclothymic</td>
<td>0.45 (0.22)</td>
<td>0.52 (0.19)</td>
<td>0.33 (0.23)</td>
</tr>
<tr>
<td>Hyperthymic</td>
<td>0.53 (0.22)</td>
<td>0.48 (0.21)</td>
<td>0.51 (0.21)</td>
</tr>
<tr>
<td>Irritable</td>
<td>0.39 (0.24)</td>
<td>0.43 (0.18)</td>
<td>0.30 (0.21)</td>
</tr>
<tr>
<td>Anxious</td>
<td>0.39 (0.22)</td>
<td>0.55 (0.21)</td>
<td>0.19 (0.17)</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01.
the depressive, anxious, and irritable temperaments were significantly higher odds, and hyperthymic temperament was (nonsignificantly) lower odds common among suicide attempters (Table 3).

4. Discussion

Our findings support and extend the prior findings on the significant association between cyclothymic (Akiskal et al., 2003; Kochman et al., 2005; Young et al., 1994/1995) and depressive (Henry et al., 1999) temperament and lifetime suicide attempts in clinical samples of patients with unipolar and bipolar major mood disorders as well as in community sample (Cloninger et al., 1998). Our present results are in good agreement with the recent findings of Pompili et al. (2008) showing that depressive, cyclothymic, anxious and irritable temperaments are strongly related to the suicidal risk and hyperthymic temperament seems to be protective against it. These results further support the strong relationship between depression and suicidal behavior even on temperament level, and suggest that further thymic temperament does not have predisposing role for suicidal behavior at least in the case of nonviolent suicide attempters. However, the possibility whether cyclothymic temperament plays a protective role against suicidal behaviour needs further studies. As current major depression and low (dysregulated) central serotonergic function are the two strongest clinical and biological predictors for suicidal behavior (Rihmer, 2007; Wasserman et al., 2007), and a strong link between the "s" allele of the serotonin transporter gene and recent serious suicide attempts has been also reported (Wasserman et al., 2007) our present findings are also in line with our other recent results on the significant relationship between the "s" allele of the serotonin transporter gene and depressive, cyclothymic, irritable and anxious, but not with hyperthymic temperament (Gonda et al., 2006).

The significantly higher rate of dominant affective temperaments among suicide attempters than among normal controls (90.0% vs 21.5%) might be the reflection of the fact that 80% of the suicide attempters have had current DSM-IV (unipolar or bipolar) major depressive episode providing a further support between the strong relationship between affective temperaments and full-blown unipolar and bipolar major mood disorders (Akiskal, 1996; Akiskal et al., 2006; Akiskal and Pinto, 1999).

The relationship between affective temperaments and suicidal behavior seems to be more complex than the simple additive effect of depressive personality components and current major depressive episode, as cyclothymic temperament seems to be also a contributor of suicidality in patients with other than current major depressive episode. Comparing OCD patients with (n=302) and without (n=272) cyclothymic temperament, the rate of patients with prior suicide attempt was almost double in cyclothymic (20%) than in non-cyclothymic (12%) subgroup (Hantouche et al., 2003). The prominent role of cyclothymic temperament/cyclothymia in the development of suicidal behavior has been also supported by two recent studies, showing that history of rapid mood switching and panic attacks (i.e., high acuity of distress) were associated with increased likelihood of prior suicidal ideation or attempt (MacKinnon et al., 2005), and variability in suicidal ideation (probable as the consequence of cyclothymia) was a significantly better predictor of previous suicide attempts than duration and intensity of ideation (Witte et al., 2005).

As suicidal behavior has several psycho-social determinants even among patients with current depressive disorders (Coryell and Young, 2005; Hawton et al., 2005; Rihmer, 2007) and affective temperament might be the mediating variable between environment and clinical depression (Rihmer, 2007) considering the affective temperament in the clinical practice could help clinicians in estimating both the short and long-term risk of suicidal behavior particularly in patients with mood disorders.

An important limiting factor should be that we have compared the affective temperaments of suicidal patients and healthy controls and we do not have a control group of non-suicidal psychiatric patients. However, comparing the affective temperament profile, as measured also by TEMPS-A, among 62 suicidal and 88 non-suicidal psychiatric inpatients (80% of them have had unipolar major depression or bipolar I or II disorder) Pompili et al. (2008) reported very similar results: psychiatric patients with current suicidal risk showed elevated TEMPS-A depressive, cyclothymic, irritable and anxious scores and lower hyperthymia scores than psychiatric patients with no such a risk suggesting that the affective temperament profile of non-suicidal psychiatric patients is more close to non-psychiatric controls. Another limiting factor could be that almost all of the subjects studied (90%) showed at least one current Axis I mental disorder, most frequently major depressive episode. However, a previous study showed that – except the most severe clinical states – TEMPS-A subscores were not significantly biased by acute psychopathology (Akiskal et al., 2005b). On the basis of clinical impression, all of the depressed patients included into this study were only mildly or moderately depressed, which is in good agreement with clinical observations and with recent empirical findings (Jallade et al., 2005), i.e., due to the catarctic affect of self-aggression depression frequently shows a marked, but short living improvement after suicide attempt. Finally, it should be also noted that since aggressiveness/impulsivity are important personality characteristics that play an eminent role in violent suicidal behavior (Mann et al., 2005; Maser et al., 2002; Zouk et al., 2006) and we investigated only nonviolent suicide attempters, our findings should pertain only to this patient-population.

Role of the funding source
No funding was received for the work described in this paper.

Table 3

Number (% of persons and odds ratios with dominant affective temperament (mean ±2SD or above) among suicide attempters and healthy controls

<table>
<thead>
<tr>
<th>Temperament</th>
<th>Suicide attempters (n=150)</th>
<th>Controls (n=302)</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive*</td>
<td>56 (37.3)</td>
<td>14 (4.6)</td>
<td>11.83 (6.29–22.22)</td>
</tr>
<tr>
<td>Cyclothymic</td>
<td>11 (7.3)</td>
<td>13 (4.3)</td>
<td>1.69 (0.74–3.88)</td>
</tr>
<tr>
<td>Hyperthymic</td>
<td>1 (0.7)</td>
<td>9 (2.9)</td>
<td>0.21 (0.02–1.68)</td>
</tr>
<tr>
<td>Irritable**</td>
<td>16 (10.7)</td>
<td>10 (3.3)</td>
<td>3.34 (1.47–7.56)</td>
</tr>
<tr>
<td>Anxious*</td>
<td>51 (34.0)</td>
<td>19 (6.3)</td>
<td>7.40 (4.16–13.15)</td>
</tr>
<tr>
<td>Total*</td>
<td>135 (90.0)</td>
<td>65 (21.5)</td>
<td>–</td>
</tr>
</tbody>
</table>

*p<0.001; **p<0.01.
Conflict of interest
None of the authors have any conflicts of interests to declare.

References


