

Original Research

## Attempted Suicide Related Posttraumatic Stress Disorder in Depression – An Exploratory Study

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**Abstract:** Studies evaluating stress hormone regulation after a suicide attempt reported an endocrine pattern similar to Post Traumatic Stress Disorder (PTSD). These findings led to the assumption that an attempted suicide may trigger the development of PTSD-like symptoms. To test this hypothesis, we retrospectively evaluated the incidence of PTSD in response to an attempted suicide in depressed patients participating in the Munich Antidepressant Response Signature (MARS) project. 30 patients with a history of a suicide attempt were included. 46.7% of these patients reported PTSD-like symptoms in specifically in response to the suicide attempt and independent from other past traumatic experiences. The risk to develop PTSD after a suicide attempt increased with the severity of the attempted suicide and with the precautions taken to prevent discovery. Our findings suggest that depressed patients surviving a suicide attempt experience a severe trauma likely to induce PTSD. We conclude that PTSD-specific medical and psychological interventions should be considered after severe suicide attempts.

**Keywords:** Posttraumatic Stress Disorder, Acute Stress Reaction, Suicide Ideas, Suicide Attempts

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Attempted suicide is one of the most dramatic consequences of mood disorders. Almost 70% of patients with an affective disorder suffer from suicidality during an acute depressive episode (Weissmann et al., 1991), and 15.9% of patients with unipolar depression and 29.2% with bipolar disorder report suicide attempts during lifetime (Chen & Dilsaver, 1996).

Hyperactivity of the hypothalamus-pituitary-adrenocortical (HPA) axis is a prominent laboratory finding in acute depression (Ising et al., 2005). Prospective studies suggest that an impaired regulation of the HPA-axis indicated by an abnormal non-suppression of cortisol following application of dexamethasone is associated with an increased risk for a suicide attempt in the near future (Carroll et al., 1980; Coryell & Schlessler, 2001). Mathew et al.

(2003) reported results from a cohort of adolescents with major depression and normal control subjects who have been followed for approximately 10 years after serial cortisol measurements over a 24-h period. A subgroup of depressed adolescents attempted to commit suicide during the follow-up period; the 24-h cortisol pattern of this subgroup was characterized by elevated afternoon cortisol levels. However, while HPA-axis hyperactivity might be a predictor of a future suicide risk, an opposite pattern can be observed in depressed patients who recently survived a suicide attempt. For instance, a blunted HPA-axis response to the combined dexamethasone (DEX) / corticotrophin releasing hormone (CRH) test has been described in severely depressed patients who recently attempted to commit a suicide (Pfennig et al., 2005). Linqvist et al., (2008) investigated salivary cortisol in 35 suicide attempters and 16 healthy controls and found that suicide attempters displayed lower evening cortisol levels compared with the control group, with lowest levels observed in depressed suicide attempters. Among female patients, repeated suicide attempts were additionally

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associated with low morning and midday salivary cortisol.

These findings suggest that a blunted responsivity of the HPA-axis could be a consequence of an attempted suicide corresponding with findings of a blunted HPA-axis response in traumatized patients suffering from a Posttraumatic Stress Disorders (PTSD) (de Kloet et al., 2006; Ströhle et al., 2008; see also the review by Yehuda 2009). This led us to the hypothesis that surviving an attempted suicide may result in a trauma-like condition potentially triggering the development of PTSD as sequela of a traumatic suicide attempt.

Many studies consistently showed that women have a twofold higher risk to develop PTSD after trauma exposure (e.g. Breslau et al., 1998; Breslau et al., 1997; Kessler et al., 1995, Tolin & Foa, 2006). Besides gender, seriousness and dangerousness of the traumatic event are further predictors for PTSD risk (Brewin et al., 2000). PTSD sometimes emerges from a prior Acute Stress Disorder (ASD) (O'Donnell et al., 2003). In addition, peritraumatic dissociations correlate with a consecutive PTSD risk (e.g. Cardena & Spiegel, 1993; Freinkel et al. 1994). Individual coping style of a subject is assumed to play an important role with respect to PTSD development. It has been argued that an avoidant coping-style increases the risk for developing PTSD (e.g. Beaton et al., 2002). Finally, a history of adverse life events has also been identified as an additional risk factor for the development of PTSD (Ozer et al., 2003).

In the light of these findings, the secondary aim of the present study was to test the hypothesis that the risk of developing PTSD after an attempted suicide (SPTSD) is aggravated by general PTSD risk factors as describe above, especially, female gender, severity and seriousness of the suicide attempt, the presence of ASD, peritraumatic dissociation, a maladaptive coping style, as well as a history of other adverse life events.

## Method

### Participants

The study was conducted with inpatients participating in the Munich Antidepressant Response Signature (MARS) project (Hennings et al., 2009), who had been treated for depression in the hospital of the Max Planck Institute of Psychiatry between the years 2003 and 2007. Depression diagnosis was obtained by trained psychiatrists following the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Patients with the diagnosis of a major depression, single or recurrent episode, and a history of a suicide attempt were included. Patients

with depressive syndromes secondary to any medical or neurological diseases were excluded. Eligible MARS patients of the past years were contacted by telephone and invited to participate in this study. In case of participation, a telephone interview was scheduled after all study details were explained and a consent form was sent by mail together with a set of questionnaires. The study protocol was approved by the local Ethics Committee of the Medical Department at the Ludwig-Maximilians-University Munich.

30 patients (66.7% female) suffering from a moderate to severe depressive episode at the time of their past hospitalisation and with a history of at least one suicide attempt agreed to participate in the telephone interview. The number of attempted suicides was 1.64 on average with nine patients reporting more than one suicide attempt. In this case, the most recent suicide attempt was selected for this analysis. The mean age at the time of the attempted suicide was 39.9 years (SD=15.0), which was on average 11 years (SD = 14) before the interview.

### Procedure

Depression diagnosis, clinical history and coping style data were collected within the MARS project during the past inpatient stay of the patients. All other variables were collected by questionnaires or in a structured telephone interview performed during the years 2007/08 except of 5 patients, who have been interviewed in person at the end of their hospitalisation. The interview included a detailed life-time evaluation of suicide attempts (number, time, and description of the method, medical consequences; episodes of self-harm without suicidal intention were not considered) and other traumatic events during life-time. A structured clinical evaluation of the DSM-IV diagnosis of PTSD was performed for every trauma including the most recent suicide attempt using a computer-assisted version of Composite International Diagnostic Interview (M-CIDI; Wittchen & Pfister, 1997). PTSD independent from the suicide attempt as well as suicide attempt related PTSD (SPTSD) was diagnosed following the same DSM-IV criteria.

### Questionnaires

In addition to the structured interview, patients filled in several questionnaires that have been sent after the telephone interview, and returned by mail in prepaid envelopes. The set of questionnaires included the Suicide Intent Scale assessing the intention to die by evaluating objective circumstances related to the suicide attempt (8 items) and self-reported seriousness of the suicide attempt (7 items) (SIS, Beck et al., 1974; American Psychiatric Association, 2000). The SIS items can be

divided into four factors describing Conception, Preparation, Precautions against discovery and previous Communication about suicidality and suicide plans (Misson et al, 2010). In addition, the Risk Rescue Rating Scale (RRRS, Weisman & Worden, 1972) was applied to evaluate the potential lethality of the suicide attempt. This scale contains two subscales, Risk factors (5 items) such as the lethality of the methods or the physical consequences of the suicide attempt, and Rescue factors (5 items) such as the rescue likelihood due to the circumstances of the suicide attempt. The ratio between the two scores has been calculated to reflect the Lethality risk of the attempted suicide. The intensity of the acute stress reaction after the attempted suicide was retrospectively assessed with the Acute Stress Disorder Scale (ASDS; Bryant et al., 1998). The scale includes 19 items evaluating symptoms of hyperarousal, dissociation, avoidance and re-experience. Peritraumatic dissociations related to the suicide attempt were measured with the Peritraumatic Dissociative Experiences Questionnaire (PDEQ; Marmar et al 1994; Marmar et al. , 1997) evaluating retrospectively the degree of derealisation, depersonalisation, and dissociative experiences at the time of the attempted suicide.

The patient's coping-style was assessed with the 78 items version of the German Stress Coping Questionnaire (Stressverarbeitungsfragebogen SVF78; Ising et al., 2001; Erdmann & Janke, 2007) evaluating coping style on 13 scales, which can be grouped to three "positive" second order factors (Devaluation, Distraction, Control) of potentially adaptive, stress-reducing coping styles, and to one "negative" second order factor (Rumination and despair), comprising potentially maladaptive, distressing coping styles.

### Data Analysis

The impact of the categorical variables gender and high vs. low socio economic status on the development of a SPTSD was analyzed using the Chi<sup>2</sup>-Test. All other variables were analyzed with the Mann-Whitney-U-Test. Arithmetic mean values ± standard deviations are reported. The level of significance was set to  $p = .05$ . All analyses were performed with SPSS (Version 17.01).

### Results

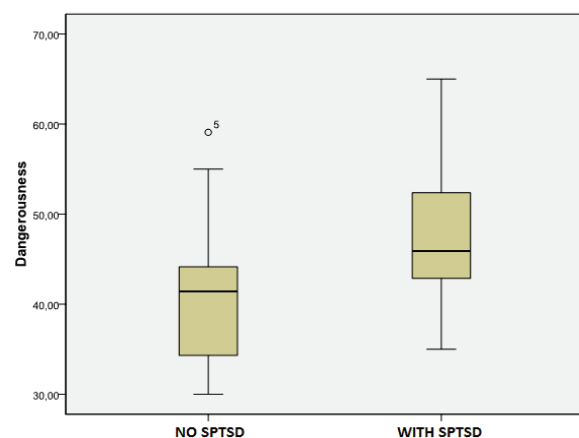
The most common method for the suicide attempts was an overdose of sedating medication (23 patients or 76.7%). One patient used an overdose of a non-sedating medication, two patients attempted drowning themselves, two were rescued after hanging, one after wrist cutting and one after

jumping in front of an oncoming train. 14 out of the 30 participants (46.7%) developed a full-blown SPTSD, while further 3 patients (10%) were diagnosed with a subthreshold or partial SPTSD, i.e., patients were meeting all criteria for PTSD except reporting only one or two instead of three avoidance/numbing (C) criteria or one instead of two arousal (D) criteria (Stein, Walker, Hazen, & Forde, 1997). To achieve optimal power for the subsequent analyses, full and subthreshold SPTSD were combined. Ten patients (33.3%) additionally fulfilled the diagnosis of a previous PTSD due to an event defined as "traumatic" according to the (A) criteria of the DSM-IV, but unrelated to the suicide attempt. The PTSD event occurred on average 17 years (SD = 13) prior to the interview.

Patients with and without SPTSD did not differ in gender ( $\text{Chi}^2[\text{df} = 1] = 1.67; p = .20$ ), nor in their socio economic status ( $\text{Chi}^2[\text{df} = 1] = 0.0; p < 1.0$ ), nor in the number of previous traumatic events ( $0.75 \pm 1.24$  vs.  $0.86 \pm 1.03; p = .41$ ) or in the rate of a previous PTSD diagnosis ( $\text{Chi}^2[\text{df} = 1] = 0.10; p = .76$ ).

Significant group differences between patients with and without SPTSD were observed for the SIS subscale Precautions against discovery ( $p = .01$ ) and for RRRS indicating the lethality risk of the attempted suicide ( $p = .04$ , see Figure 1) with more serious suicide intention and higher lethality risk scores in SPTSD (see Table 1). Both scores, the SIS subscale and RRRS, point into the same direction, while being partly related to each other ( $r = .42, p = .03$ ).

**Figure 1. Reported lethality of attempted suicide (Risk-Rescue Rating Scale) in patients with and without attempted suicide related PTSD.**



No group differences could be found for the remaining SIS scales, nor for acute stress reaction (ASDS), peritraumatic dissociations (PDEQ), or coping style (SVF78).

**Table 1. Results relating SPTSD to the intention to die, the dangerousness of the attempted suicide, the peritraumatic dissociations, an ASD and coping strategies (N=30).**

		SPTSD		Mann-Whitney- U-Test	asymptotic significance (2-tailed)
		no	yes		
<b><i>Suicide Intent Scale (SIS)</i></b>					
Intention to die	M	30.62	32.58	83.00	.24
	SD	5.68	5.66		
Conception	M	14.12	15.66	67.0	.17
	SD	2.94	2.81		
Preparation	M	6.62	6.29	96.5	.51
	SD	2.25	2.55		
<i>Precaution against discovery</i>	<i>M</i>	<i>5.67</i>	<i>7.31</i>	<i>45.5</i>	<b><i>.01</i></b>
	SD	1.40	2.25		
Communication	M	4.12	4.00	88.0	.50
	SD	1.02	.82		
<b><i>Risk-Rescue Rating Scale (RRRS)</i></b>					
<i>Lethality risk</i>	<i>M</i>	<i>41.61</i>	<i>47.09</i>	<i>62.5</i>	<b><i>.04</i></b>
	SD	8.02	7.30		
<b><i>Acute Stress Disorder Scale (ASDS)</i></b>					
Acute stress reaction	M	43.90	45.69	98.00	.58
	SD	12.56	8.62		
<b>Peritraumatic Dissociative Experiences Questionnaire (PDEQ)</b>					
Peritraumatic dissociations	M	21.66	22.19	112.00	.74
	SD	9.08	9.32		
<b><i>Stress Coping Scale (SVF78)</i></b>					
Devaluation	M	10.79	9.19	71.50	.09
	SD	2.56	4.55		
Distraction	M	10.66	11.19	109.50	.92
	SD	3.71	3.72		
Control	M	15.21	16.87	104.00	.76
	SD	3.05	2.56		
Rumination and despair	M	13.23	13.65	105.50	.80
	SD	4.40	5.73		

*Note.* Significant effects are in italic bold.

SPTSD: Attempted suicide related post-traumatic stress disorder

M: mean

SD: standard deviation

## Discussion

Our results demonstrate a high incidence of post-traumatic stress disorder according to DSM-IV criteria in response to a suicide attempt (SPTSD) in patients with a major depression single or recurrent episode. The SPTSD incidence was 46.7%, which can be regarded as comparable to the high incidence rates usually observed after very severe traumatic events such as rape or physical abuse during childhood (Kessler et al., 1995). Incidence of SPTSD was not confounded by a PTSD diagnosis due to other traumatic events. The number of previous traumatic events or the habitual coping style was also unrelated to the SPTSD risk. Therefore, we can conclude that SPTSD is specifically connected to the suicide attempt and not related to a dispositional coping style or to previous traumatic events in the history of the patients. This is further supported by the observed finding that severity and seriousness in terms of the potential lethality of the attempted suicide is associated with the development of SPTSD. This is in agreement with findings from a meta-analysis reported by Brewin et al (2000) who concluded that the seriousness or severity of a traumatic event is a very strong predictor for consecutive PTSD. In addition, taking precautions against discovery contributed to an elevated risk of developing SPTSD. This finding further supports an important role of the seriousness of the suicide attempt as SPTSD risk factor. However, no association could be found between PTSD risk and the reported intention to die. A possible explanation for the inconsistency between taking precautions against discovery and the intention to die could be the time span between the suicide attempt and the clinical interview, which was 11 years on average. Details about specific measures taken to prevent detection might be easier to remember than attitudes or intentions related with the suicide attempt.

Several studies reported positive associations between peritraumatic dissociation and the risk to develop PTSD (e.g. Cardena & Spiegel, 1993; Freinkel et al., 1994). This could not be confirmed in our study. Again, the long time span between trauma (suicide attempt) and interview could have contributed to the negative finding. Generally, a history of a recent suicide attempt seems to be associated with pathological dissociations independent from a PTSD diagnosis (Zoroglu et al., 2003; Maaranen et al., 2005), which might have masked a potential effect.

A number of potential limitations has to be discussed. First, the study sample is small and participants have been recruited from the MARS project, an on-going longitudinal depression study, which might limit the generalizability of the reported

findings. However, attrition rate of the invited patients was low (below 15%), which could be related to the fact that the patients were already used to questionnaires and interviews due to their participation in the MARS project. Furthermore, the MARS project has been designed as a naturalistic study (Hennings et al., 2009) assuring high participation rate for a broad representation of patients with moderate to severe major depression. Second, the long time span between the attempted suicide and the diagnostic interview might have impaired a precise recall of all details related to the suicide attempt. Also psychopathological improvement at the time of the interview might have interfered with memorizing the situation, when the patient attempted to commit suicide. However, the congruence of the observed associations between SPTSD risk and potential lethality of the attempted suicide as well as precautions against discovery suggests that at least these aspects of the attempted suicide have been correctly remembered. Finally, different methods had been used for the suicide attempt, which could have influenced recall to different degrees. For instance, overdosing with sedating medication was the most frequently applied method, which could have had a stronger impact on memorizing all details than intoxication with non-sedating medication or wrist cutting. However, the small sample size of the study unfortunately did not allow performing separate analyses for the different methods used for the attempted suicide.

Despite these limitations, we found evidence for the development of SPTSD in almost half of the investigated patients plus subthreshold SPTSD in further 10%. While these results await confirmation by prospective studies with a sufficient number of participants and including a control group of depressed patients without history of suicide attempts, our findings, nevertheless, demonstrate a high risk for developing PTSD-like symptoms in response to a suicide attempt in depression. Therefore, treatment of developing SPTSD symptoms should be considered as additional therapeutic approach in depressed patients surviving a recent suicide attempt.

The decision to attempt suicide is accompanied by emotional turmoil and, thus, a state of extreme stress. In addition, medical consequences of a suicide attempt can be severe, especially after using "hard" methods, further contributing to perceiving a suicide attempt as traumatic. However, only a minority of the patients in our sample actually used such kind of methods; nevertheless, SPTSD rate was high. So the recall of the painful circumstances leading to the decision giving up life seems to be sufficient reason for experiencing the suicide attempt as a traumatic event.

In summary, this is the first study suggesting that a suicide attempt can be a traumatic event for depressed patients and, thus, is associated with the risk of developing SPTSD. The SPTSD risk is related to specific severity characteristics of the suicide attempt rather than to a general disposition of coping styles or to a previous trauma history suggesting that an SPTSD specific medical and psychological intervention should be considered in patients surviving a suicide attempt.

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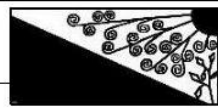
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