

Depression, traumatic dissociation and epileptic-like phenomena

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Abstract

OBJECTIVES: According to recent findings trauma and stress are important etiological factors in pathogenesis of depression. As characteristic features of depressive cognition have been reported intrusive thoughts and memory disturbances similar to posttraumatic symptoms known in patients with posttraumatic stress disorder or dissociative disorders. Hypothetically is also suggested a close relationship of traumatic dissociation and epileptic-like phenomena.

SETTINGS AND DESIGN: In the clinical study were assessed 70 adult people with a diagnosis of depression and 50 healthy controls. In the assessment were used 6 measures for symptoms of dissociation, depression, traumatic stress and psychosensoric symptoms of epileptic origin (the so-called complex partial seizure-like symptoms).

RESULTS: Reported data show that a great number of depressive patients who met the cut-off score for dissociative disorders (34.2%, N=24) had significantly higher traumatization, depression, subjectively experienced stress and complex partial seizure-like symptoms than the whole group of patients and the controls. Most significant traumatization has been found in patients who met the cut-off score of psychosensoric epileptic-like symptoms which is characteristic for the epilepsy spectrum disorder (5.7%, N=4).

MAIN FINDINGS: Significant correlations of these assessed symptoms suggest close relationship between traumatic stress and dissociation in depression. This close relationship of dissociative symptomatology and traumatic stress also implicates an important role of dissociative processes in depression as a typical manifestation of depressive cognition. Assessed relationship between traumatic distress and complex partial seizure-like symptoms suggests a possible role of epileptic-like phenomena in dissociative states related to depression.

CONCLUSIONS: Assessed relationship between traumatization, depression and epileptic-like phenomena in the patients who met cut-off score for epilepsy spectrum disorder can contribute to the problem of indication of several depressive patients to anticonvulsant therapy because of reported evidence that a clear majority of patients with epilepsy spectrum disorder respond well to anticonvulsant treatment. Careful assessment of this test battery thus may be useful also for anticonvulsant treatment strategy.

Introduction

According to neurodevelopmental research traumatic insults such as perinatal hypoxia, hyperthermia and other traumas affecting brain functions in the first periods of life often have long-term impact on emotional, behavioral, cognitive, social and physiological functions [6, 12, 13, 16, 22, 26, 35]. Traumatic insults may induce a hyperexcitable state linked to a lowered seizure threshold and can lead to a latent epileptogenic process or may result in epilepsy. These processes have been modelled in animals by the kindling model of epilepsy. Kindling represents repetition of subconvulsive electric stimuli that can induce lowered seizure threshold and may result in a progressive epileptic state. Although this model is very well elaborated in animals at this time it is not clear whether kindling really corresponds to human epileptogenesis [18, 38]. Kindling model has been also suggested as an explanation for the epileptic-like phenomena related to repeated trauma and stress such as child abuse and neglect [24, 25, 35]. This hypothetical connection between traumatic stress and epileptic-like phenomena is in accord with evidence that in patients with dissociative disorders who are victims of child abuse have been found frequent and unusual EEG abnormalities without common epileptic seizures [3, 5, 11, 16, 21, 30, 32, 34, 35]. Further supportive evidence is that in several psychiatric patients often without apparent EEG abnormalities have been observed psychosensoric symptoms of epileptogenic nature (the so-called complex partial seizure-like symptoms). These epileptic-like symptoms normally belong to characteristic manifestations of temporal lobe epilepsy but may emerge also without apparent motor seizures [14, 17, 27]. Typical and characteristic symptoms are memory gaps, confusional spells, staring spells, episodic irritability, episodic rinitid, episodic aphasia, jamais vu, olfactory hallucinations, gustatory hallucinations, visual illusions (e.g., scintillations), paresthesias, anesthetics, auditory illusions (e.g., phone ringing) headache with nausea and/or photophobia abrupt mood shifts, *deja vu*, abdominal sensations, intrusive thoughts and parasomnias [14, 27, 29]. A great deal of these symptoms is characteristic for the so-called Epilepsy Spectrum Disorder (ESD). Although the phenomenology of ESD and the positive clinical response to anticonvulsant seen in most ESD patients would suggest the presence of subclinical electrophysiological dysfunction, the lack of clear non-behavioral evidence of CNS dysfunction (i.e., EEG) may obscure the underlying neurological nature of ESD [14, 27]. On the other hand these epileptic-like symptoms have been reported in close relationship to increased sensitivity on parental influence and dissociative tendency related to child abuse and other traumatic or aversive events [28]. Abnormal brain changes in patients with dissociative disorders reports also several imaging studies which describe hippocampal abnormalities in trauma patients [8, 25, 35]. The above data suggests the hypothesis that pathological influence of traumatic stress in dissociated patients is combined with specific vulnerability of the

nervous tissue (mainly in the hippocampus), genetic factors and perinatal insults similarly as it is known in etiology of schizophrenia [7, 20, 22, 26, 36, 37].

The purpose of this study is to assess relationship among symptoms of traumatic stress, depression, dissociation and complex partial seizure-like symptoms in depressed patients. One of the practical purposes of this analysis is also to provide clinical data that can contribute to the problem of indication of several depressive patients to anticonvulsant therapy. With respect to these purposes two hypotheses may be formulated. First hypothesis states that traumatic stress and dissociation in depression are closely related and this may implicate also data for the relationship between traumatic stress and depression, and a possible role of traumatic dissociation in depressive cognition. Second hypothesis states that traumatic stress and dissociation are related to psychosensoric epileptic-like phenomena which might arise from repeated trauma and might be linked to increased complex partial seizure-like symptoms. This hypothesis may contribute to the problem of indication of several depressive patients to anticonvulsant therapy because of reported evidence that a clear majority of patients with epilepsy spectrum disorder respond well to anticonvulsant treatment.

Materials and methods

Participants

Participants were 70 adult depressive inpatients from the university hospital and 50 healthy controls from general population. Patients were 17 males and 53 females (mean age 48.3). 50 healthy controls were 20 males and 30 females (mean age 39.2). Patients had diagnosis of bipolar (N=7) or unipolar depression (N=63). Given diagnosis was confirmed according to DSM IV criteria [1]. Treatment status of the patients was relatively stabilized and without psychotic symptoms.

Design

In the clinical study were assessed 70 adult inpatients with diagnosis of depression and 50 healthy controls. In the assessment were used 6 measures for symptoms of depression, complex partial seizure-like symptoms, dissociation and traumatic stress. Investigations taken place in a quiet room and in the patients were performed in small groups from three to five people with informed consent of all the participants.

Measures

For the screening of depression was used Beck depression inventory BDI-II [2] that represents 21-items questionnaire for assessing depression. Subjects indicate degree of their experience on 4-point likert scale. A value ≥ 30 represents a criterion associated with major depression.

Complex partial seizure-like symptoms that reflect temporal lobe epileptic activity were assessed by 35-items Structured Clinical Interview for Complex Partial Seizure-like Symptoms [27, 29] (the so-called Iowa interview). These symptoms represent characteristic

psychosensoric manifestations indicated in patients with complex partial epilepsy at first described by Hughlings Jackson in his classical studies about dreamy states and psychological dissolution [27, 29, 31]. Experienced symptoms are indicated on 6-point likert scale. A value ≥ 70 represents a criterion associated with the so-called Epilepsy Spectrum Disorder.

Psychic dissociative symptoms were assessed by Dissociative Experiences Scale (DES) [4]. DES represents 28 items self-reported questionnaire examining main dissociative phenomena such as absorption, amnesia, depersonalization, derealization, reality distortion and other. Subjects indicate a degree of their experience on the continuum from 0% to 100%. DES scores into two sets were separated. The first set contains the whole group of patients and the second characterizes patients who satisfy cut-off score for dissociative disorders ($DES \geq 25$).

Somatoform dissociative symptoms were assessed using 20-items self-reported somatoform dissociation questionnaire SDQ-20 [23]. Somatoform dissociative symptoms represent alterations in sensation of pain (analgesia, kinesthetic anesthesia), some painful symptoms, alterations of perception, motor inhibition, loss of motor control, gastrointestinal symptoms and other. Subjects indicate degree of their experience on 5-point likert scale. SDQ scores were separated into two sets, the first set for the whole group of patients and the second that characterizes patients who satisfy cut-off score for somatoform dissociative disorders ($SDQ \geq 40$).

For investigation of childhood traumas TSC-40 (Trauma Symptom Checklist) [10, 39] was used. TSC-40 is a self-reported 40-items questionnaire on 4-point likert scale. Along to main score it contains also subscales regarding dissociation, anxiety, depression, sex-

ual abuse trauma index (SATI), sleep disturbances and sexual problems. Total score of TSC-40 higher than 70 is associated with symptoms of significant childhood traumas.

Subjectively experienced stress was assessed by IES (Impact of Event Scale) [15]. IES is a 15-items self-reported questionnaire on 4-point likert scale, reflecting intensity of posttraumatic phenomena, based on subjectively experienced stress. IES has two main groups of questions which measure intrusion and avoidance. For IES score ≥ 35 is highest value of prediction (0.88) and subjective stress measured by IES is associated with the criteria for posttraumatic stress disorder [33].

Analysis

Descriptive statistics in a statistical evaluation included medians, means and standard deviations. For further statistical evaluation Pearson product-moment correlations and t-test for independent samples for the whole group of patients and normal healthy controls were calculated.

Results

Results of descriptive statistics are in *Table 1* and *Table 2*. These data suggest significant dissociation and traumatization in the marked part of depressive patients (34.2%, $N=24$) who met the cut-off score for dissociative disorders (either psychic or somatoform). Most significant traumatization has been found in 4 patients (5.7%) who met the cut-off score for the epilepsy spectrum disorder ($Iowa \geq 70$). Significant correlations (*Table 3*) between dissociative symptoms, characteristics of traumatic stress and complex partial seizure-like symptoms were found. These correlations suggest

Table 1: Descriptive statistics for the whole group of depressive patients and for the healthy controls.

Variable	All depressive patients N=70		Normal healthy controls N=50		All the patients and controls t-test
	Mean \pm SD	Median	Mean \pm SD	Median	
Age, years	48.3 \pm 12.2	52.0	39.2 \pm 12.4	41.0	4.03***
BDI-II	24.7 \pm 12.6	24.0	1.9 \pm 3.1	0	12.5***
DES	13.3 \pm 11.2	10.0	8.9 \pm 9.7	6.4	2.26*
SDQ-20	29.2 \pm 9.5	26.0	21.1 \pm 2.6	20.0	5.85***
TSC-40 Tot.	43.3 \pm 20.5	43.5	10.2 \pm 14.4	5.0	9.80***
TSC-40 Diss.	6.2 \pm 3.5	6.0	3.8 \pm 4.9	2.0	3.10**
TSC-40 Anx.	9.1 \pm 4.7	9.0	1.5 \pm 3.3	0	9.75***
TSC-40 Dep.	12.0 \pm 5.7	12.5	1.2 \pm 2.8	0	12.17***
TSC-40 SATI	6.8 \pm 4.2	7.0	0.6 \pm 1.9	0	9.76***
TSC-40 Sleep	8.5 \pm 4.7	9.0	0.9 \pm 2.5	0	10.25***
TSC-40 Sex.	8.0 \pm 5.1	7.0	2.0 \pm 3.7	0	7.06***
IES	30.2 \pm 17.6	34.0	5.7 \pm 9.7	2.0	8.94***
Iowa	28.5 \pm 21.5	24.5	5.9 \pm 7.1	2.0	7.13***

Note. DES= Dissociative Experiences Scale; SDQ-20= Somatoform Dissociation Questionnaire; TSC-40 Tot.= Trauma Symptom Checklist-total score; Diss.= dissociation; Anx.= anxiety; Dep.= depression; SATI= sexual abuse trauma index; Sleep= sleep disturbances; Sex.= sexual problems; IES= Impact of Event Scale; Iowa= Structured Clinical Interview for Complex Partial Seizure-like Symptoms; * $p = 0.025$; ** $p = 0.002$; *** $p < 0.00001$

Table 2: Descriptive statistics for the patients with DES \geq 25, SDQ \geq 40 and Iowa \geq 70 who met the cut-off score for dissociative disorders and epilepsy spectrum disorders.

Variable	Depressive patients with DES \geq 25, N=10	Depressive patients with SDQ \geq 40, N=14	Depressive patients with Iowa \geq 70, N= 4
Age, years	50.0 \pm 3.5	46.2 \pm 13.9	39.0 \pm 16.9
BDI-II	34.1 \pm 8.3	36.7 \pm 9.3	35.7 \pm 8.6
DES	35.8 \pm 8.9	24.3 \pm 12.8	32.0 \pm 14.7
SDQ-20	39.6 \pm 10.6	45.5 \pm 5.6	43.0 \pm 7.3
TSC-40 Tot.	56.6 \pm 15.1	63.1 \pm 16.8	72.2 \pm 10.0
TSC-40 Diss.	10.3 \pm 3.9	9.7 \pm 3.3	12.2 \pm 2.9
TSC-40 Anx.	12.6 \pm 4.0	13.6 \pm 4.0	16.5 \pm 1.9
TSC-40 Dep.	15.0 \pm 4.0	16.8 \pm 5.0	17.7 \pm 3.8
TSC-40 SATI	9.3 \pm 3.8	11.47 \pm 3.7	14.0 \pm 3.1
TSC-40 Sleep	11.6 \pm 3.8	12.4 \pm 3.2	13.2 \pm 2.7
TSC-40 Sex.	8.7 \pm 3.6	11.8 \pm 4.3	12.2 \pm 4.1
IES	39.5 \pm 13.4	40.0 \pm 15.0	44.5 \pm 13.8
Iowa	51.1 \pm 18.8	55.0 \pm 15.8	75.7 \pm 6.5

Table 3: Correlation among measures for 70 depressive patients

Variable	DES	SDQ-20	TSC-40 Tot.	IES	Iowa
BDI-II	0.40**	0.50**	0.73**	0.53**	0.57**
DES	1.0	0.63**	0.43**	0.30*	0.57**
SDQ-20	0.63**	1.0	0.56**	0.39**	0.63**
TSC-40 Tot.	0.43**	0.56**	1.0	0.58**	0.75**
TSC-40 Diss.	0.57**	0.61**	0.82**	0.50*	0.71**
TSC-40 Anx.	0.45**	0.56**	0.88**	0.55*	0.74**
TSC-40 Dep.	0.39**	0.50**	0.93**	0.52**	0.66**
TSC-40 SATI	0.42**	0.58**	0.89**	0.52**	0.68**
TSC-40 Sleep	0.41**	0.48**	0.85**	0.51**	0.62**
TSC-40 Sex.	0.24*	0.45**	0.79**	0.42**	0.50**
IES	0.30*	0.39**	0.58**	1.0	0.58**
Iowa	0.57**	0.63**	0.75**	0.58**	1.0**

Note. Marked correlations are significant at:

* $p < 0.05$, ** $p < 0.001$

significant relationships among traumatic influence, subjectively experienced stress, dissociation and epileptic-like phenomena which are related to influence of trauma and stress in the etiology of the disease. Results of t-tests between measures for the patients and for the control group (Table 1) suggest that both groups are significantly different.

Discussion

The present data show that marked number of depressive patients who satisfy the cut-off score for dissociative disorders (34.2%, N=25; DES \geq 25 or SDQ \geq 40) had significantly higher traumatization, depression, subjectively experienced stress and complex partial seizure-like symptoms than the whole group of patients (Table 2). Most significant traumatization found in 4 patients who met the cut-off score for the epilepsy spectrum disorder (Table 2) confirms the preliminary expectation because these epileptic-like symptoms have been mentioned in close relationship to increased sensitivity on parental influence and dissociative tendency related to child abuse and other traumatic or aversive events [28]. Significant correlations of these assessed symptoms (Table 3) suggest close relationship between traumatic stress and dissociation in depression, and confirm the findings which reported important role of posttraumatic phenomena such as intrusive thoughts and memory disturbances in depressive patients [9, 19]. Also was supported the hypothesis regarding a possible role of epileptogenic phenomena related to traumatic stress in pathogenesis of dissociative states in depression because of significant correlations of traumatic stress, dissociation and complex partial seizure-like symptoms. The data not confirmed an alternative hypothesis that increased stress and trauma are not related to dissociation in depression. Also second alternative hypothesis that there is not any relationship among traumatic stress, dissociation and epileptic-like phenomena with respect to experienced stress and trauma measured by Iowa interview was not confirmed.

Close relationship of dissociative symptomatology, traumatic stress and depression also suggests important role of dissociative processes in depression. From the neurobiological point of view influence of psychosocial stressors on depression confirms an important role of neurohormonal indicators of stress responsivity, mainly cortisol release resulting from activation of the hypothalamic-pituitary-adrenal axis. In this manner stress probably worsens the depressive symptoms. Assessed relationship between traumatization, depression and epileptic-like phenomena in the patients who met cut-off score for epilepsy spectrum disorder can contribute to the problem of indication of several depressive patients to anticonvulsant therapy because of reported evidence that a clear majority of patients with epilepsy spectrum disorder respond well to anticonvulsant treatment. Careful assessment of this test battery thus may be useful also for anticonvulsant treatment strategy.

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