

A complex phenotype of suicidal behavior: a case of post brain injury dissociative disorder

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Summary

We describe a case of a 54-year-old Caucasian woman with a complex phenotype for suicidal behavior after traumatic brain injury. At the admission patient had Bipolar Disorder, Post Traumatic Stress Disorder, Dissociative Identity Disorder, Conversion Disorder (with Psychogenic Non Epileptic Seizures) and a drug treatment for a post-traumatic epilepsy. During a follow up period of 30 months, despite the symptomatological improvements due to psychopharmacological treatments (including also lithium) and psychoeducation treatment, the patient showed yet high risk of suicide and high levels of dissociation.

Key words

Suicide risk • Dissociation • Dissociative Identity Disorder • Traumatic Brain Injury • Psychogenic Non Epileptic Seizures • Epileptic Seizures • Post Traumatic Stress Disorder • Bipolar Disorder

Introduction

Annually, up to 50 million people experience a traumatic brain injury (TBI) in worldwide ¹. Individuals with a history of TBI have higher rates suicidal ideation and behaviours than general population ². People with a history of TBI experience the development of several mental disorders increasing the suicide risk. TBI has been associated with a risk of Bipolar Disorder (BD) ^{3,4}, a mental illness in which a high risk of suicide attempts is well established ⁵. Post-Traumatic Stress Disorder (PTSD) is frequently associated with suicidal ideation and suicide attempts ⁶. A recent systematic review and meta-analysis of prevalence rates of PTSD after civilian traumatic brain injury reports that PTSD was present in 13.5% of patients with mild TBI and in 11.8% of those patients with a moderate or severe TBI ⁷. Considering those studies including only motor vehicle accidents PTSD prevalence was higher ranging from 19.6 to 36% ⁷. Dissociative Identity Disorder (DID) is a chronic post-traumatic condition ⁸ characterized by “disruption of identity characterized by two or more distinct personality states” ⁹. Rates of attempted suicide range from 61 to 72%, with 1 to 2.1% completing suicide among patients with DID ¹⁰. Moreover, dissociation is a major mediator between early traumatic experiences and suicidal behavior ¹¹. Different studies show the co-occurrence of TBI and Psychogenic Non Epileptic Seizures (PNES) varying between 16 and 83% ¹². PNES can occur in isolation as a form of dissociative disorder, or in association with various neurological and psychiatric conditions such as epilepsy or PTSD ¹². Suicide risk is higher in epileptic patients ¹³ and in PNES patients ¹⁴ with no significant difference between two groups ^{14,15}.

But what happens when all these clinical conditions are together?

We describe a complex case of woman that, after TBI, had a post-traumatic epilepsy and developed a complex phenotype for suicidal behaviour characterized by BD, PTSD, DID, PNES.

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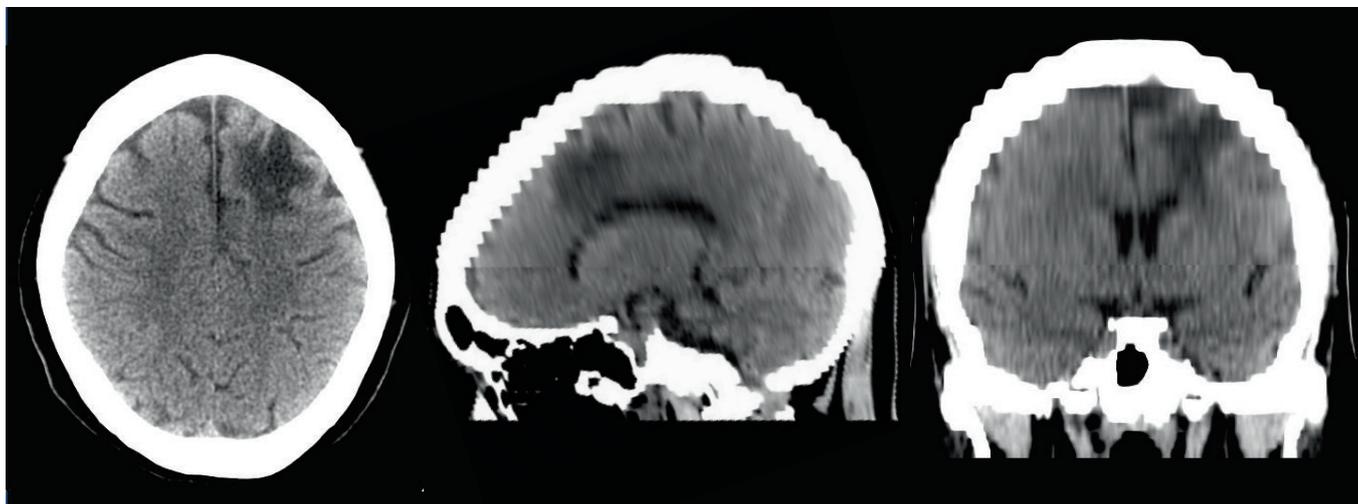


FIGURE 1. *Computed Tomography (CT) imaging scan of head. It is clearly evident a large lesion in right frontal area.*

Case report

A.T. is a 54-year-old Caucasian right-handed woman, married, with no children. A.T. sets the onset of her symptoms in 2011 (47 years old) after a road accident (the patient had a collision with a car while she was driving on her motorcycle). From her clinical documentation, we learned that the patient reported: right clavicle fracture, left ankle fracture, cervical verticalization, displaced fracture of the right peroneal malleolus, and cerebral hemorrhage in the frontal right lobe with perilesional edema. For this reason, she was hospitalized for 20 days. A metal plate was used for displaced fracture of the right peroneal malleolus and for this reason the patient could not perform a Magnetic Resonance Imaging (MRI) scan. During the hospitalization, the patient reported several episodes of depersonalization (“I was on the ceiling and I looked my body on the bed”). After the road accident, she presented a “treatment-resistant” epilepsy, accompanied by Psychogenic Non Epileptic Seizures (PNES), with a multiple frequency of these crises during the day (about 4/day).

From January 2012 to December 2016, A.T. had 8 accesses to the emergency room (ER) of different hospitals for PNES characterized by: average duration of about 20 minutes, situational onset, presentation of crises with discontinuous and asynchronous shocks, pelvic thrust movements, absence of loss of urine and feces.

In January 2017, A.T. was conducted to the ER of our University Hospital for a suicidal attempt with cuts to the wrists. At her arrival in the hospital, she presented a sub-continuous state of epileptic-type crises characterized by alterations of the state of consciousness along with repetitive, stereotyped motor behaviors. Due to the prolongation of this epileptic-type state, she was hospitalized. After seven days of clinical observation and execution of instrumental investigations (resting EEG, video-EEG dur-

ing seizures; Computed Tomography (CT) imaging scan of head, see Figure 1), neurologists discharged the patient with a diagnosis of “Psychogenic Non Epileptic Seizures in post-traumatic epilepsy”, with a therapy consisting of lacosamide 400 mg, fenobarbital 50 mg, zonisamide 300 mg, citalopram 20 mg, clobazam 10 mg, quetiapine 50 mg, and levotiroxine 50 mcg; during hospitalization, the attempt to use valproic acid as an anti-epileptic drug was interrupted because it caused the patient’s hair loss.

At discharge, the patient was referred to Day Hospital Service of our Psychiatry and Clinical Psychology Unit, where she performed, in addition to the standard clinical interview, a complete psychopathological and diagnostic assessment, composed by structured and semi-structured interviews as well as psychometric battery.

During the clinical interview (including also Dissociative Disorders Interview Schedule, DDSI), we evaluated the specific characteristics of the PNES and we recollected the traumatic history. PNES characteristics were: average duration of about 20 minutes, gradual onset and extinction, situational onset, presentation of crises with discontinuous and asynchronous shocks, pelvic thrust movements, absence of loss of urine and feces, possibility of external agents to modulate the crisis, fast post critical recovery. On several occasions during the clinical evaluations, A.T. presented PNES crises. After crises, we observed the presence of two other identities in the patient: one identity was a woman of 31 years old (before the road accident), who stated that “I am single, I live with my mother ... I’m well, I’m happy, why I’m in the hospital?”; and another identity was a woman of 47 years old (age of road trauma), that was constantly crying, that reported things like “I’m sick, I’m so sick. My husband prefers to go to his dying mother rather than staying with me. I feel like I could die, I feel very bad”. When the dominant identity (host) returned, the pa-

tient reported severe headaches and she had no memory of the other identities. The host denied to suffer because her husband wasn't going to visit her in the hospital saying "I was out of danger; his mother was dying".

The psychometric battery included: Hamilton Depression Scale (HAM-D), Mania Rating Scale (MRS), Beck Depression Inventory (BDI), Beck Hopelessness Scale (BHS), Clinician-Administered PTSD Scale (CAPS), Dissociative Experiences Scale (DES), Clinician-Administered Dissociative State Scale (CADSS). This psychometric assessment was administered at baseline and after 6, 12, 18, 24 and 30 months of follow-up. (see Table I for the scores).

In the medical history, before the motor vehicle accident, the patient reported periods of sub-threshold depressive and hypomanic symptomatology; no psychotropic drug therapy or psychiatric hospitalization was described. A history of migraine was also reported. At baseline observation, the patient had the criteria for the following DSM-5 diagnoses: Bipolar Disorder subtype I (with actual Mixed State), Post Traumatic Stress Disorder, Dissociative Identity Disorder (DID) and Conversion Disorder (with Psychogenic Non Epileptic Seizures).

A.T. refused psychotherapy treatment, so she was offered psychotropic medications (quetiapine 300 mg, lorazepam 2 mg; citalopram 20 mg and clobazam 10 mg were discontinued) and psychoeducation treatment. In March 2017, the patient attempted suicide by self-defenestration: she was stopped by her husband that unexpectedly returned home. Consequently, the patient was admitted in an acute psychiatric unit for 11 days. After the discharge, she did return in our Day Hospital Service: lithium treatment was gradually introduced (until 900 mg/die) and quetiapine was increased to 400 mg/die as well. Additionally, due to her continuous refusal to the psychotherapy, the patient continued psychoeducation treatment, with a gradual improvement on insight of her clinical condition. In November of the same year, A.T. reported suicidal ideation and planning, so she was recovered again in an acute psychiatric unit for 10 days. A.T. returned again in our service: lithium was titrated up to 1200 mg/die and quetiapine until 500 mg/die; she also continued psychoeducation treatment, with gradual reduction of intensity and frequency of PNES crises, that were gradually replaced by episodes of trance. These episodes were characterized by: initial stereotyped hands movements, acute loss of consciousness and insensitivity to environmental stimuli, with a duration about 2-3 minutes. No other identities were observed or were referred by the husband throughout 2018 until the last follow-up assessment in July 2019. During the entire follow-up period, the patient continued refusing any type of psychotherapy treatment. In January 2019, based on neurologists' indication, the patient suspended therapy with fenobarbital 50 mg, continuing taking lacosamide 400 mg and zonisamide 300 mg. The last pharmacotherapy

TABLE I. Psychometric assessment at the baseline (T) and during the follow-up period (T6 to T30).

	T0	T6	T12	T18	T24	T30
HAM-D	27	16	9	12	6	10
MRS	18	12	8	4	2	4
BDI	52	46	36	35	26	24
STICSA-S	81	54	47	26	29	30
BHS	18	18	16	14	14	14
DES	90.35	59.85	66.07	71.42	74.07	59.5
CADSS	82	57	55	47	49	52
CAPS	99	92	76	65	63	59

HAM-D: Hamilton Depression Scale; MRS: Mania Rating Scale; BDI: Beck Depression Inventory; BHS: Beck Hopelessness Scale; CAPS: Clinician-Administered PTSD Scale; DES: Dissociative Experiences Scale; CADSS: Clinician-Administered Dissociative State Scale.

(July 2019) was: lacosamide 400 mg; zonisamide 300 mg; carbolithium 1200 mg, quetiapine 400 mg, lorazepam 1.5 mg, levotiroxine 50 mcg.

At the follow-up of 30 months, the patient satisfied the criteria for the following DSM-5 diagnoses: Bipolar Disorder subtype I (with actual Eutimic State), Post Traumatic Stress Disorder and Other Type of Dissociative Disorder with Dissociative Trance. No criteria for Dissociative Identity Disorder (DID) and Conversion Disorder (with Psychogenic Non Epileptic Seizures) were satisfied. At that time, A.T. reported a general improvement of her clinical conditions; moreover, her husband also confirmed a general, positive advancement in his wife's functioning. Psychometric assessment confirmed symptomatologic improvements (Tab. I). As depicted in Figure 2, during the follow-up period of 30 months it was observed a decrease of mean duration (in minutes) of dissociative crisis despite their monthly number remained high. Unfortunately, despite the reported and observed symptomatologic improvements, A.T. showed yet a high risk of suicide (see BHS score in Tab. I), as well as the patient showed high levels of dissociation (see DES and CADSS score in Tab. I). Consequently, we hypothesize that the patient's high risk of suicide is associated with dissociation levels that remain high in follow-up.

Discussion

The present case illustrates a complex interaction between environmental, biological and psychological factors in the pathogenesis of suicidal behaviour. Following exposure to a motor vehicle accident, our patient developed a complex psychiatric symptomatology such as mood disorder (Bipolar Disorder), trauma-related

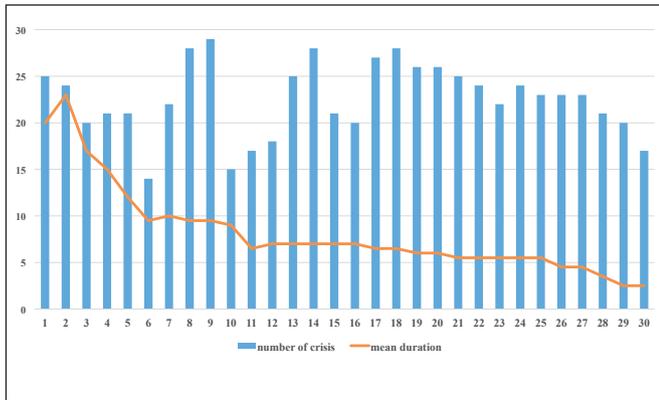


FIGURE 2. Monthly number of mean duration (in minutes) of dissociative crisis during the follow-up period of 30 months.

disorder (PTSD), dissociative disorder (Dissociative Identity Disorder), conversion disorder (Psychogenic Non Epileptic Seizures) and organic disorder (Epileptic Seizures). Each of these disorders is associated with a greater risk of suicide than the general population^{5 6 10 13 14}, such as for the TBI2. In particular AT's psychopathological picture at the beginning of our clinical observation was consistent with recent literature that shows crisis states in DID include self-mutilation, flashbacks, non-epileptic seizures and suicide attempts¹⁶. After two months of observation, the patient attempted suicide and lithium was gradually inserted in pharmacotherapy (until 1200 mg/die). During the follow up period (T6-T30) the patient reported symptomatological improvements of all domains, except for dissociation and suicidal risk (see Table I). Consequently, we suppose that these two clinical features could be strongly related to each other.

In follow up period, the DES score declined from 90.35 to 59.5 and the CADSS score from 82 to 52. We hypothesized that this reduction could be caused by the transition from Dissociative Identity Disorder and Other Type of Dissociative Disorder with Dissociative Trance. This transition can be understood by integrating Porges' theory¹⁷ with the theory of structural dissociation of the personality, a trauma model that presents a unitary framework to understand diverse trauma-related responses¹⁸. According to this theory, different parts of personality (called dissociative emotional parts) are based on diverse defensive subsystems (fight/flight responses) that remain rigidly blocked in traumatic experiences and can appear when the subject is facing traumatic issues¹⁹. In complex dissociative disorders, these responses are rooting dissociative parts with different levels of mental structure and autonomy and the activation of dissociative parts may be clinically expressed in the more extreme dissociative cases, overt personal-

ity switching¹⁹. Furthermore, a dorsal-vagal activation ('system shutdown') is characteristic of life-threatening situations with no chance to escape and the presence of a structured dissociative part is not so frequent. Consequently, we can hypothesize that at beginning our patient had dissociative emotional parts and a sympathetic activation and later she presented a dorso-vagal activation without structured dissociative parts.

Furthermore, dissociative behaviour may simply reflect behavioral disinhibition secondary to right frontal damage. Moreover, we also hypothesize that TBI and subsequent hospitalization might have been sufficient to trigger a complex behavioral response.

In the literature relatively few cases of DID after TBI are reported. For example, a dissociative behavior after right frontal TBI was found in a Vietnam Veteran²⁰. The study hypothesized that the structural focal lesion in the right superior prefrontal cortex (Brodmann area 6), causing a selective amnesia of the details of the TBI, acted together with the bilateral dysfunction of anterior paralimbic regions (orbitofrontal, anterior temporal, and cingulate cortices) not only to favor the intrusion of memories related to previous traumatic experiences, but also to trigger dissociative flashbacks. The authors conclude that dysfunction of certain regions of the prefrontal cortex and anterior temporal cortex involved with old episodic memories may play a role in the occurrence of dissociative flashbacks²⁰.

Similarly, a recent case report shows a transiently dissociation of identity in a 67 years old right-handed man with a left parietal lobe hematoma with mass effect and an old lacunar infarct in the right frontal lobe²¹. The alterations of personality gradually subsided after six to eight weeks and coincided with the resolution of the hematoma. The authors hypothesized that a neurological insult to the left parietal brain can lead to a compensatory uninhibited activity of contralateral right parietal lobe. This can lead to retrieval of repressed traumatic, implicit episodic memory, streaming in to the consciousness leading to the onset of Dissociative Identity Disorder²¹. It should be noted that suicidality has not been reported in the two clinical cases mentioned above.

ECT studies show two contrasting case report. In fact, a study shows a new onset of Dissociative Disorder Not Otherwise Specified (only one other identity) after 7 temporal right-sides Electroconvulsive Therapy²² in 51 years old woman with bipolar disorder, hypothyroidism, migraine and history of anorexia nervosa admitted for depression and suicidal ideation. The study hypothesized that the fact that the ECT treatments were unilateral right-hemisphere may have contributed to the patient's presentation²². In contrast, a recent case report show treatment with ECT weekly for 2 years for a 39-years-old woman with DID, complex PTSD and Ma-

for Depressive Disorder-Congruent Psychotic Features and chronically suicidal behaviour contributed in some capacity to this patient's personality integration²³.

Dissociative experiences are common across different psychiatric disorders²⁴. A recent meta-analysis²⁵ showed that in comparison to non DD psychiatric patients, DD patients were more likely to report a lifetime history of both suicide attempts (SA) and nonsuicidal self-injury (NSSI). SA and NSSI could represent an attempt to cope with dissociative symptoms or an ultimate attempt to reach a dissociative state²⁵.

A.T. presented a PTSD. In 1 to 12% of people experiencing major psychological trauma²⁶, PTSD could be presented as a complex and symptomatologically heterogeneous clinical picture²⁷, dysregulating, from molecular level (including neuroplasticity mechanisms²⁸) to large brain networks²⁹, several biological functions. Despite a decrease in posttraumatic symptoms over time, at the follow-up of 30 months A.T. showed yet a moderate PTSD symptomatology (see CAPS score in Table I). Unfortunately, she refused, repeatedly, psychotherapy. The first line of PTSD treatment is a trauma focused psychotherapy such as Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) or Eye Movement Desensitization and Reprocessing (EMDR)³⁰. Several studies demonstrated EMDR clinical efficacy is determined by large and complex brain modifications of people affected by PTSD³¹⁻³⁴, including also those affected by TBI³⁵. Unfortunately, she refused, repeatedly, psychotherapy.

We cannot exclude that A.T.'s clinical condition could have benefited from EMDR treatment, both for dissociative symptoms both for suicidality, particularly for EMDR effect on limbic and associative cortex.

Despite the improvement of depressive symptoms over time, A.T. suicidality persisted (see BDI and BHS scores in Table I). This may be interpreted as a reduction of somatic depressive symptoms in spite of persistence of depressive ideation, associated to low personal resources and coping strategies³⁶. We believe that in A.T.'s clinical case a psychotherapy approach might determine a clinical improvement also through an improvement of personal coping resources.

Another clinical issue arises from our clinical case: the presence of multiple diagnoses. Both at the beginning and after 30 follow-up months A.T. presented several DSM diagnoses with several psychopathological overlapping areas. If this situation is a diagnostic distortion of our current diagnostic classification systems in Psychiatry is debating³⁷.

Results from this our clinical observation suggests that more structured researchers with accurate clinical assessment are needed in order to better understand the complex relation between dissociative experiences and suicidal behaviors, particularly in those patients with TBI.

Conflict of interest

The Authors declare to have no conflict of interest.

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