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Post-Traumatic Stress Disorder: Management at the Montfort Hospital

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***Abstract*—**The post-traumatic stress disorder (PTSD) rises from exposure to a traumatic event and appears by a persistent experience of this event. Several psychiatric co-morbidities are associated with PTSD and include mood disorders, anxiety disorders, and substance abuse. The main objective was to compare the criteria for PTSD according to the literature to those used to diagnose a patient in a francophone hospital and to check the correspondence of these two criteria. 700 medical charts of admitted patients on the medicine or psychiatric unit at the Montfort Hospital were identified with the following diagnoses: major depressive disorder, bipolar disorder, anxiety disorder, substance abuse, and PTSD for the period of time between April 2005 and March 2006. Multiple demographic criteria were assembled. Also, for every chart analyzed, the PTSD criteria, according to the Manual of Mental Disorders (DSM) IV were found, identified, and grouped according to pre-established codes. An analysis using the receiver operating characteristic **(**ROC) method was elaborated for the study of data. A sample of 57 women and 50 men was studied. Age was varying between 18 and 88 years with a median age of 48. According to the PTSD criteria in the DSM IV, 12 patients should have the diagnosis of PTSD in opposition to only two identified in the medical charts. The ROC method establishes that with the combination of data from PTSD and depression, the sensitivity varies between 0,127 and 0,282, and the specificity varies between 0,889 and 0,917. Otherwise, if we examine the PTSD data alone, the sensibility jumps to 0.50, and the specificity varies between 0,781 and 0,895. This study confirms the presence of an underdiagnosed and treated PTSD that causes severe perturbations for the affected individual.

***Keywords*—**Post-Traumatic Stress Disorder, diagnosis, co-morbidities, mental health disorders.

I. Introduction

PTSD is a condition that describes the complex somatic, cognitive, emotional, and behavioral effects of psychological trauma. [1]. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV), PTSD results from exposure to a traumatic event that causes the individual to fear, distress or horror. This disorder is manifested by a persistent re-experience of the traumatic event, avoidance behaviors of the stimuli associated with the trauma, a blunting of the general reactivity and a state of neuro-vegetative hyperactivity [2].

Since its diagnostic identification in 1980, PTSD has been associated with significant impairment including loss of employment [3], decreased quality of life [4], social isolation [5] and suicide [6]. In addition, psychiatric co-morbidities associated with this disorder is numerous and includes depression [7], anxiety disorders [8], substance abuse [9], and somatoform disorders [10]. This co-existence leads to confusion in the diagnosis of PTSD [11].

The nature of the traumatic event, the gender of the individual, and their personal and social experience with the psychological stimulus are the main criteria for determining the frequency of PTSD [12]. Risk factors include a low socio-economic level, a lacking social network, a personal or family history of psychiatric illnesses, as well as the initial severity of the response to the traumatic stimulus [13]. The lifetime prevalence of PTSD ranges from 5% to 10% [14] with a point prevalence of 5% to 6% [15] with an increase of up to 17% in the military and war veteran population [16].

A family medicine practice groups a very diverse and multicultural patient population including patients from war-torn countries, refugees, abused people and survivors of various accidents. This population is at high risk for PTSD [17]. Given the associated co-morbidities, the diagnosis of PTSD in the primary care setting is often not made, hence the importance of having specific criteria for diagnosis and community resources available for follow-up. This is a retrospective study of medical records to compare PTSD criteria in the literature with those used to diagnose PTSD at a francophone hospital, the Montfort Hospital in Ottawa, and to identify the associated co-morbidities.

II. Method

A. Record Identification

The Montfort Hospital's medical records identified patients admitted to the medical unit or the psychiatry unit with diagnoses of depression, bipolar disorder, anxiety disorder, substance abuse, and PTSD for the period spans from April 2005 to March 2006. This period, as well as the files, which met the established criteria, was selected randomly. Of the 205 files identified by the Montfort Hospital archives, the first 117 files were selected in no particular order for the purpose of this study.

B. Data Collection

Data collection was based on clinical records where the primary or secondary diagnosis was PTSD, depression, anxiety disorders, bipolar disorder or substance abuse. This was the first diagnosis on the record. The following data were identified in the charts: discharge diagnosis, the degree of diagnosis as primary, secondary or tertiary; personality disorder, patient sex, age, race, education and employment,

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specific traumatic event, psychiatric comorbidities, suicidal thoughts or attempts, treatment, remission, number of psychiatric hospitalizations, personal or family history of psychiatric illness, time elapsed between trauma and demand for medical assistance, immigration, country of origin or country at war, medical or psychological treatment, follow-up and number of subsequent visits as well as references to other disciplines. In addition, for each file reviewed, the diagnostic criteria according to the DSM IV for PTSD 2 were searched and ranked according to Table I in the following categories: confrontation with the traumatic event, the symptoms of intrusion, the symptoms of avoidance and blunting of the affects, neuro-vegetative symptoms, duration for more than one month, and significant suffering or impaired functioning.

TABLE I
CRITERIA OF PTSD (INDICATE IF APPLICABLE)

Criteria A The person has been exposed to a traumatic event in which the following is present
1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.
Criteria B The traumatic event is persistently re-experienced in one (or more) of the following ways (at least 1)
1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
2. Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience; illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific re-enactment may occur.
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
Criteria C Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by the following: (at least 3)
1.Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2.Efforts to avoid activities, places, or people that arouse recollections of the trauma
3.Inability to recall an important aspect of the trauma
4.Markedly diminished interest or participation in significant activities
5.Feeling of detachment or estrangement from others
6.Restricted range of affect (e.g., unable to have loving feelings)
7.Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal lifespan)
Criteria D Persistent symptoms of increased arousal (not present before the trauma). At least 2
1.Difficulty falling or staying asleep
2.Irritability or outbursts of anger
3.Difficulty concentrating
4.Hypervigilance
5.Exaggerated startle response
Criteria E Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.
Criteria F The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
Acute (< 3 mois)
Chronic (> 3 mois)

III. RESULTS

The sample obtained from 107 clinical records at Montfort Hospital, a francophone hospital in Ottawa, contained 57 women and 50 men. The age of this population ranged from 18 to 88 years with an average age of 50.4 years and a median of 48 years. Fig. 1 summarizes the division of psychiatric diseases by sex. In the depression category, 41 women and 28 men were identified. For the other cases, five women and 16 men with the diagnosis of substance abuse, five women and two men had anxiety disorders and four women and four men were identified as bipolar. For PTSD, only two women had a diagnosis on file. The associated personality disorders are found in the order of 31.8% (34 patients) for the dependent personality, 8.4% for the borderline personality, 2.8% for the antisocial personality, as well as obsessive-compulsive and 0.9% for the histrionic personality.

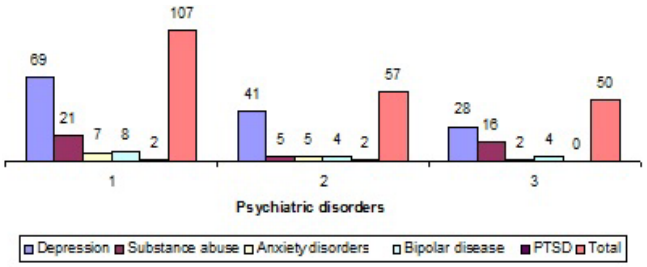

Fig. 1 Psychiatric disorders divided according to 3 categories: total (1), female (2), male (3)

At the demographic level, all patients were Caucasian except for one Asian patient. One patient had emigrated from a European country as a child but no other patient came from a country at war or had refugee status in Canada. In terms of employment, 30% of patients were off work for reasons of health or age. However, for the same percentage of patients, there was no mention of work on file. It is impossible to show specific results for education, follow-up visits and referrals to other health professionals because there is a lot of ambiguity in the files.

In the study population, 57 (53.3%) patients had suicidal ideation of which 29 (27.1%) patients had attempted suicide. For medical treatment, 102 (95.4%) patients received one or more antidepressants, a selective serotonin reuptake inhibitor (SSRI) with or without a first-generation or atypical antipsychotic drug.

By categorizing patients according to the PTSD criteria in Table I, specific codes were developed from 0 to 4. Code 4 is given to the patient when all PTSD criteria are met. Code 3 is granted when the two criteria of A, one criterion of B, two criteria of C and one criterion of D are present. For code 2, the four criteria present are the top 10 regardless of the category. There remains only 1 criterion required for code 1 and no criteria for code 0. According to these criteria, 12 patients would have the diagnosis of PTSD according to DSM IV and code 4. Table II shows the division of patients with 12 receiving the code 4 and 4 patients receiving respectively codes 4, 3 and 2.

TABLE II
PTSD ACCORDING TO THE CRITERIA OF THIS STUDY

Code	PTSD according to Criteria of this study		
	Male	Female	Total
4	2	10	12
3	1	3	4
2	2	2	4
1	2	2	4
0	43	40	83
Total	50	57	107

In Tables III and IV, diagnoses of PTSD, depression, anxiety disorders, bipolar disorder or substance abuse according to the Montfort Hospital archives are re-categorized according to study codes. It should be noted that in file review, the patient diagnosed with PTSD had no specific diagnostic criteria except a history of sexual abuse as indicated in the clinical notes. In addition, eight patients diagnosed as depressed met all criteria for PTSD and three patients including one male and two female code 3. Referring to Table IV, a patient diagnosed with an anxiety disorder and a patient whose diagnosis is bipolar disorder will be suffering from PTSD. For substance abuse, we find one patient who meets all the criteria for PTSD and one patient who deserves code 3.

TABLE III
THE CHARTS AT MONTFORT WITH DIAGNOSIS IS PTSD OR DEPRESSION CATEGORIZED ACCORDING TO THE CODES OF THIS STUDY

Code	PTSD as per Montfort charts			Depression as per Montfort charts		
	Male	Female	Total	Male	Female	Total
4	1	1	1	0	8	8
3	0	0	0	1	2	3
2	0	0	0	2	2	4
1	0	0	0	2	2	4
0	1	1	1	23	27	50
Total	0	2	2	28	41	69

TABLE IV
THE CHARTS AT MONTFORT DIAGNOSED WITH ANXIETY DISORDERS OR SUBSTANCE ABUSE CATEGORIZED ACCORDING TO THE CODES OF THIS STUDY

Code	Anxiety Disorders			Bipolar Disorders			Substance Abuse		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
4	0	1	1	0	1	1	1	0	1
3	0	0	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
0	2	4	6	4	3	7	15	4	19
Total	2	5	7	4	4	8	16	5	21

IV. ANALYSIS OF RESULTS

The use of ROC curves classifies and analyzes the diagnostic system for PTSD. With reference to Table V, patients were either diagnosed or not with the disease under consideration (PTSD, on the one hand, or PTSD and depression combined, on the other) according to 4 criteria: code 4 only, code 3 or more, code 2 or more, or codes 1 or more. For the PTSD, the sensitivity is 0.5 according to these 4 criteria whereas the specificity varies between 0.781 and 0.895 with the corresponding highest value (as expected) to the code 4. When the values of depression and PTSD are combined, the sensitivity for code 4 is the lowest at 0.127 and goes up to 0.282 while the specificity varies between 0.889 and 0.917 (Table VI). Figs. 2-4 respectively show the ROC curves for the PTSD/Depression, the PTSD and the two superimposed curves on the same graph.

TABLE V
CRITERIA MET FOR PTSD COMPARED TO PTSD AND DEPRESSION COMBINED (NUMBER OF PATIENTS)

Code	4	3 or 4	2, 3 or 4	1, 2, 3 or 4
PTSD	1	1	1	1
Depression	8	11	15	19
Depression and PTSD	9	12	16	20

TABLE VI
ROC TEST FOR PTSD AND DEPRESSION AND PTSD COMBINED

Code	PTSD		Depression and PTSD	
	Sensitivity	Specificity	Sensitivity	Specificity
4	0.5	0.895	0.127	0.917
3 or 4	0.5	0.895	0.169	0.889
2, 3 or 4	0.5	0.819	0.225	0.889
1,2 3 or 4	0.5	0.781	0.282	0.889

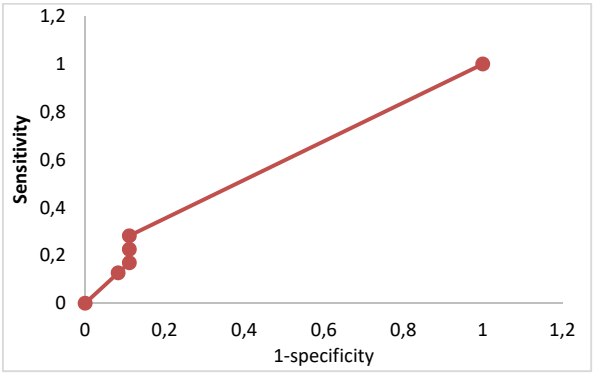

Fig. 2 ROC curve for depression and PTSD combined

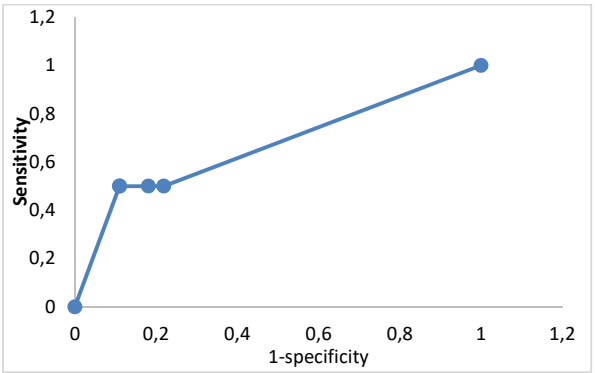

Fig. 3 ROC curve for PTSD alone

V. DISCUSSION

PTSD is a complex syndrome associated with many psychiatric co-morbidities including affective disorders, anxiety disorders, connective disorders and substance abuse [9].

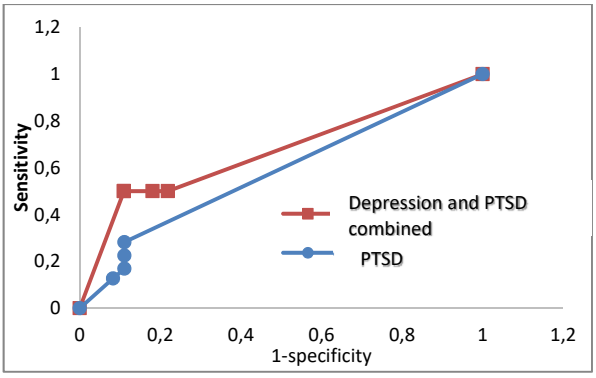

Fig. 4 Combined ROC curves comparing PTSD with depression and PTSD alone

The difficulty of making the diagnosis was clearly demonstrated in the analysis of clinical records when 11 patients had diagnoses of depression, anxiety disorder, bipolar disorder and substance abuse. Depression is the most noticeable confounding factor. According to our results, 11% of our study population and not 1.8% (only two patients) would have PTSD, which is comparable to the percentage specified in the literature [18]. The main causal trauma is a separation from a couple, a physical accident or illness, death of a loved one, or physical or sexual abuse. These traumatic events resemble previous studies that include physical or sexual abuse during childhood or adulthood, incest and rape [9]; natural disasters [12], motor vehicle accidents, severe physical illnesses such as myocardial infarction or cerebrovascular accident [3]. Given that the study population was almost exclusively a Caucasian population of which no members came from a country at war or military mission, extrapolations cannot be made.

The diagnostic criteria for DSM IV for PTSD are clearly established. However, there is no scale for individuals with symptoms of PTSD who do not meet all the criteria for PTSD but who have significant suffering and impaired functioning that goes beyond affective disorders or anxiety disorders. Undertreated PTSD likely results from incomplete healing of the syndrome or its development with untreated symptoms following trauma. Individuals with under-treatment PTSD criteria report a professional, social and personal impairment comparable to that seen with the complete disorder [19].

The ROC curve is a graphical tool that can be used to represent the ability of diagnostic criteria and to discriminate in a given population, those with PTSD and those not affected. The curves represent, on the y-axis, the proportion of positive tests among the affected population, either the sensitivity as a function of the proportion not reached, or the complement of the specificity or 1-specificity for all the threshold values determined for the test [20]. Fig. 4 shows that in the combination of PTSD and depression, sensitivity ranges from 0.12 to 0.23; the specificity varies between 0.89 and 0.92. On the other hand, if we only examine PTSD, then the sensitivity increases to 0.50 and the specificity varies between 0.82 and 0.90. It is therefore necessary to define more formally the PTSD under-treatment. The latter is as common as PTSD and is associated with a greater alteration of the level of functioning [21]. The presence of co-morbidities including depression and substance abuse add to this confusion. Given the limited data in medical records and the limited variation in patient demographics, it is more difficult to identify PTSD in most-at-risk populations and determine the effectiveness of treatments. In addition, the frequency of follow-ups and referrals to additional agencies or therapies are not recorded in the records.

VI. Recommendations

Following this retrospective study at the Montfort Hospital, a training site for undergraduate and postgraduate learners affiliated with the University of Ottawa, we recommend:

1. A prospective study on PTSD with larger samples conducted in the francophone environment to determine the prevalence of this disorder in our community.
2. Establishment of a more specific assessment protocol for use in all patients who may develop PTSD, especially if they meet certain criteria of the target population as mentioned in this study (exposure to an event traumatic, survivors of serious illness, sexual abuse, domestic violence, accidents, and patients from countries at war, refugees, returning from peace or humanitarian missions, etc.)
3. Establishment of a therapeutic protocol focused on PTSD, which takes into account the treatment of psychiatric co-morbidities often grafted to this disorder.
4. Creation of a specialized unit to diagnose and monitor the francophone population suffering from PTSD, their psychiatric co-morbidities, psychosomatic complications and their psychosocial consequences in our community.

VII. Conclusion

In conclusion, this retrospective study established the diagnostic criteria for PTSD in the DSM IV literature. The diagnosis of PTSD in the literature has been compared to that done at the Montfort Hospital's medical and psychiatric units. Several co-morbidities, mainly depression, have been identified and led to misdiagnosis for some patients. In addition, this study asserts the presence of a PTSD sub-treatment that includes several criteria leading to severe co-morbidities. It is important to structure a good protocol for evaluation and management of patients who have been exposed to traumatic or potentially traumatic events. An evaluation protocol should be assessed by following the diagnostic criteria of the most up to date psychiatric tool such as the DSM or the ICD. The correct diagnosis of PTSD and also co-morbidities will allow an improved management focused on this disorder in a specialized setting with pharmacological and psychotherapeutic therapeutic approaches that are effective and validated according to the literature.

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