A model of suicidal behavior in war veterans with posttraumatic mood disorder

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S U M M A R Y

Many wars have been fought during the history of civilization. About 30 armed conflicts are occurring now around the globe involving more than 25 countries. Many war veterans have symptoms of posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) including suicidal ideation and behavior. PTSD is frequently comorbid with MDD. I have previously proposed that some or all individuals diagnosed with comorbid PTSD and MDD have a separate psychobiological condition that can be termed "posttraumatic mood disorder" (PTMD). This idea was based on the fact that a significant number of studies suggested that patients suffering from comorbid PTSD and MDD differed clinically and biologically from individuals with PTSD alone or MDD alone. Individuals with comorbid PTSD and MDD are characterized by greater severity of symptoms, increased suicidality and the higher level of impairment in social and occupational functioning compared to individuals with PTSD alone or MDD alone. Neurobiological evidence supporting the concept of PTMD includes the findings from neuroendocrine challenge, cerebrospinal fluid, neuroimaging, sleep and other studies. In this paper, I propose a model of suicidal behavior in war veterans with PTMD. The model consists of the following components: (1) genetic factors; (2) prenatal development; (3) biological and psychosocial influences from birth to mobilization/deployment; (4) mobilization/pre-deployment stress; (5) combat stress, traumatic brain injury, and physical injury; (6) post-deployment stress; (7) biological and psychosocial influences after the deployment; (8) trigger (precipitant) of a suicidal act; and (9) suicidal act. The first four components determine vulnerability to combat stress. The first seven components determine predisposition to suicidal behavior, a key element that differentiates PTMD patients who are at high risk from those at lower risk. Suicidal behavior in PTMD can be attributed to the coincidence of a trigger with a predisposition for suicidal behavior. Suicide prevention in war veterans with PTMD should focus on (1) improvement in recognition of PTMD; (2) treating symptoms of PTMD; (3) preventing a relapse when the patient is in remission; (4) treating suicidal ideation; (5) treating comorbid psychiatric conditions including alcohol and drug abuse; (6) treating medical and neurological disorders including traumatic brain injury; and (7) social support. It is extremely important to understand PTMD, to optimize assessment and treatment for people with PTMD, and to identify processes that facilitate recovery from exposure to traumatic events. Every nation, every generation, faces traumas that cause suicide. The world needs to deal with this and it is one thing that the world can come together on.

Introduction

Many wars have been fought during the history of civilization. About 30 armed conflicts are occurring now around the globe involving more than 25 countries [1]. More than a million of United States and thousands of United Kingdom troops have been deployed to Iraq and Afghanistan over the past several years [2,3]. The wars in Iraq and Afghanistan have presented soldiers and marines with a unique set of stressors that are chronic in nature, including civilian threats such as guerilla warfare tactics and terrorist actions. A significant proportion of members of the military service who have returned from Iraq and Afghanistan report symptoms of posttraumatic stress disorder (PTSD) and/or major depressive disorder (MDD) including suicidal ideation and behavior [1–3].

The concept of posttraumatic mood disorder

PTSD and major depression are frequently comorbid. For example, one study assessed lifetime anxiety and mood disorders comorbidity in a community sample of outpatients and found that PTSD was the anxiety disorder most likely to be associated with MDD, with 69% of individuals with PTSD also meeting criteria for MDD [4]. I have previously proposed that some or all individuals diagnosed with comorbid PTSD and MDD have a separate
psychobiological condition that can be termed “posttraumatic mood disorder” (PTMD) [5–7]. This suggestion was based on the fact that a significant number of studies suggested that patients suffering from comorbid PTSD and MDD differed clinically and biologically from individuals with PTSD alone or MDD alone. Individuals with comorbid PTSD and MDD are characterized by greater severity of symptoms, increased suicidality and the higher level of impairment in social and occupational functioning compared to individuals with PTSD alone or MDD alone. Neurobiological evidence supporting the concept of PTMD includes the findings from neuroendocrine challenge, cerebrospinal fluid, neuroimaging, sleep and other studies [5–9]. Both PTSD and MDD are associated with suicidal behavior [5–7,10–12]. An analysis of National Comorbidity Survey data demonstrated that, after controlling for a group of variables including demographics, lifetime mood disorder diagnosis, and substance use disorders, PTSD was the only anxiety disorder uniquely predictive of suicide ideation and attempts [10]. About 56–87% of individuals who commit suicide suffer from MDD [11]. In the National Comorbidity Survey, persons with a lifetime history of a major depressive episode were 10 times more likely to report having thought about killing themselves and 11 times more likely to have made a nonfatal suicide attempt [12]. The risk was even greater when the definitional criterion for depression was modified to exclude having thoughts of death, which could have potentially confounded the effect of depression on suicide outcomes. Comorbidity of PTSD and MDD is associated with increased illness burden, poorer prognosis, and delayed response to depression treatment [5–7]. Individuals suffering from PTMD (i.e., comorbid PTSD and MDD) are at a high risk for suicidal behavior [5–7,13]. For example, patients with comorbid PTSD and MDD make more suicide attempts compared to individuals with MDD alone [13].

**The concept of PTMD and suicidal behavior in war veterans**

The risk of suicide attempts among the PTSD population is six times greater than in the general population and even higher among treatment seeking war veterans with PTSD [14–16]. In fact, war veterans are twice more likely to die of suicide than are nonveterans [17]. In one study, Vietnam veterans were assessed for suicidal thinking and behaviors, and symptoms of PTSD and depression [18]. Thoughts of ending one’s life and a previous suicide attempt were significantly correlated with a diagnosis of PTSD. Veterans with a diagnosis of PTSD and MDD or dysthymia were also more likely to report suicidal thinking and behaviors than veterans with only one of the diagnoses. It is possible that many war veterans suffer from PTMD and their suicidal behavior is related to PTMD.

In this paper, I propose a model of suicidal behavior in war veterans with PTMD (Fig. 1). The model consists of the following components: (1) genetic factors; (2) prenatal development; (3) biological and psychosocial influences from birth to mobilization/deployment; (4) mobilization/deployment stress; (5) combat stress, traumatic brain injury, and physical injury; (6) post-deployment stress; (7) biological and psychosocial influences after deployment; (8) trigger (precipitant) of a suicidal act; and (9) suicidal act. The first four components determine vulnerability to combat stress (Fig. 1). The first seven components determine predisposition (diathesis) to suicidal behavior (Fig. 1). Risk factors for suicide can be organized according to whether their effect is on the threshold for suicidal acts, or whether they serve mainly as triggers or precipitants of suicidal acts. A predisposition to suicidal behavior is a key element that differentiates PTMD patients who are at high risk versus those at lower risk. Suicidal behavior in PTMD can be attributed to the coincidence of a trigger with a predisposition for suicidal behavior.

**Genetic factors**

Converging evidence from diverse research designs supports a role for genetic influences in the etiology of PTSD [19]. Family studies have laid the foreground for research in this area, indicating increased risk for PTSD in relatives. Twin studies also support the heritability of PTSD. MDD and suicidal behavior are also related to genetic predisposition [20,21]. A wealth of data indicate that additive genetic effects contribute to at least 30% of the variance in liability to major depression [20]. A recent study suggests that common genetic liability explained 62.5% of PTSD–MDD comorbidity [22]. Significant genetic overlap between MDD and PTSD implies that genes implicated in the etiology of MDD are strong candidates for PTSD and vice versa.

**Prenatal development**

There is evidence that antenatal maternal stress may adversely influence the psychological development of offspring [23]. Low birth weight and maternal malnutrition in pregnancy have been associated with a higher rate of affective disorders in adulthood [24,25]. One study found that low birth weight and younger maternal age were associated with off-spring suicide as young adults [26]. The authors also found higher maternal parity to be a risk factor for attempted, but not completed, suicide. Another study found that higher maternal parity, younger maternal age, non-professional parental occupations and low birth weight were independently associated with higher suicide risk of offspring as young adults [27]. Exposure to the World Trade Center disaster has been associated with increased risk of small-for-gestational age births as well as decrements in birth weight, birth length, gestational duration, and head circumference in a cohort of pregnant women with term births exposed to the World Trade Center [28,29]. Posttraumatic stress symptomatology and moderate depression were associated with longer gestational durations, although only posttraumatic stress symptomatology was associated with decrements in infant head circumference at birth [29].

**Biological and psychosocial influences between birth and mobilization/deployment**

A lot of different biological and psychological factors may affect the sensitivity of a person to traumatic events and play a role in the development of PTMD. Temperamental predisposition, previous exposure to traumatic events, family history of psychological problems, history of mental disorders, psychosocial problems, and life adversity may sensitize people to later traumas [30,31]. With a large degree of variability across study samples, it is possible that some individuals (e.g., nurses, firefighters) develop adaptive coping skills that may protect them from adverse responses to future traumas. It has been suggested, however, that if normal stress hormones are activated over prolonged periods of time, brain physiology and anatomy may be altered, leading to a depletion of hormones that results in an inadequate physiological response to later trauma exposure [32].

Psychiatric pathology and maladaptive personality features prior to the deployment may contribute to the development of PTMD. In the two meta-analyses, psychiatric history was found to confer a small degree of risk for the development of PTSD [33,34]. However, when one of these research groups examined a subset of studies that specifically investigated prior depression, the degree of risk increased significantly [34].

In a prospective study of risk for developing PTSD, the authors measured maladaptive cognitions of student firefighters during their training and prior to deployment [35]. Pretrauma catastrophic
thinking strongly predicted (24% of the variance) the level of PTSD symptomatology 20 months after training was completed, indicating that a tendency to catastrophize about aversive events is a risk factor for the eventual development of PTSD.

Mobilization/pre-deployment stress

For soldiers and their family members, a deployment begins long before actual departure [36]. During pre-deployment, soldiers experience a range of difficult emotions, which, usually starts with shock and anxiousness that accompany deployment notification, followed by some form of grief, denial, sadness, anger, distancing and resentment. Frequently, pre-deployment stress is related to anticipatory anxiety. Feelings of loneliness, guilt, and abandonment can also be present as departure approaches. Symptoms of pre-deployment stress include shortened tempers, difficulty sleeping and trouble concentrating.

Combat stress, traumatic brain injury, and physical injury

Most theoretical models suggest the presence of a dose-response model of PTSD in which symptom severity is a function of traumatic event severity [30,31]. Most likely, time, duration and type of stressor, sense of controllability, degree of personal impact, immediate reactions to the event, presence of dissociation at the time of the traumatic event and persistence of life threatening events play a role in the development of PTMD and determine symptom severity [1,30,31,36].

Peritraumatic variables measured to date include a range of factors such as physiology, affect, and cognitions that occur during the trauma, as well as particular aspects of the type of traumatic event [30,31]. It was observed that experiencing combat and rape or molestation were events that were especially likely to increase one’s odds of developing PTSD [37].

Pre-existing depression increases risk for developing PTSD among individuals exposed to traumatic events [38]. The incidence of first-onset depression is elevated among individuals who develop PTSD following trauma compared to the trauma-exposed who do not develop PTSD [39]. Thus, the relation between MDD and PTSD is multifaceted; MDD appears to increase risk for PTSD and vice versa. This underlines the importance of the concept of PTMD.

Traumatic brain injury (TBI) is a potential comorbid illness in cases of PTSD and PTMD [39]. At the time of impact, the kinetic energy of blunt force trauma, or blast-overpressure trauma, produces
a mechanical loading. This loading is dynamic to the head. The strain to tissue is a result of compression, tension, and shear. Mild TBI is significantly associated with psychiatric symptoms and syndromes, notably PTSD. This association remained significant after combat experiences had been controlled for. A history of mild TBI in the combat environment, particularly when associated with loss of consciousness, reflects exposure to an intense traumatic event that threatens loss of life and significantly increases the risk of PTSD. Persons with TBI have a higher risk of suicide than persons without TBI. Among outpatients with TBI, 23% reported suicide ideation and 18% reported having made a suicide attempt post-injury [40].

Physical injury during a traumatic event increases the risk for PTSD [41] and probably for PTMD. Non-injured trauma survivors do not have to contend with the psychological challenges posed by pain, disfiguration, prolonged physical impairment, or hospitalization, all of which are factors that may increase an individual's vulnerability for developing PTSD.

Post-deployment stress

The issue of post-deployment stress has been well recognized [42]. The transition from deployment to home is hard and many war veterans are having problems. A war veteran returning from combat with a particular condition is most likely to experience negative consequences of that condition to the extent that the war veteran has other vulnerabilities and encounters stressful events and circumstances. War veterans have to deal with problems readjusting to the family and the job. They may have significant interpersonal, family and occupational difficulties that often go unaddressed and unidentified.

Biological and psychosocial influences after the deployment

Multiple factors such as perceived social support, stressful situations, ongoing threat to safety, the state of health, nutrition, alcohol and drug use, climate may affect the mental condition of a war veteran [3,43,44]. A recent study suggests that adult attachment, parental bonding, and spiritual love play a role in the adjustment to military trauma [45]. Risk factors for suicide common in patients in veterans' hospitals include the male sex, the elderly, those with diminished social support, medical and psychiatric conditions associated with suicide, and the availability and knowledge of firearms. It is important to note that manifestations of posttraumatic responses to combat may not appear until long after traumatic events. War veterans and concentration camp survivors who have no apparent symptoms for many years may develop florid PTSD in response to a stressful event in later life, such as the birth of a child, the loss of a spouse, retirement, or physical illness.

Trigger (precipitant) of a suicidal act

Suicidal act refers to the occurrence of suicide attempts, which can be defined as self-directed injurious acts with at least some intent to end one's own life [46]. Suicidal behavior ranges from fatal acts (completed suicide), to highly lethal and failed suicide attempts (where high intention and planning are evident, and survival is fortuitous), and to low-lethality attempts (usually impulsive attempts that are triggered by a social crisis). Most likely, precipitants of suicidal acts in war veterans include interpersonal losses or conflicts, financial trouble, and job problems [43,44,47].

Preventing suicide in war veterans with PTMD

Suicide prevention in war veterans with PTMD should focus on (1) improvement in recognition of PTMD; (2) treating symptoms of PTMD, especially symptoms associated with suicidal behavior; (3) preventing a relapse when a patient is in remission; (4) treating suicidal ideation; (5) treating comorbid psychiatric conditions including alcohol and drug abuse; (6) treating medical and neurological disorders including traumatic brain injury; and (7) social support. War veterans often do not seek treatment, fearing it might damage their career or cause their peers to lose confidence in them. Besides, denial of PTSD or PTMD may stem from a fundamental human difficulty in comprehending and acknowledging our own vulnerability [48]. An appropriate treatment can be administered only if a correct diagnosis is established. There is thus a pressing need to improve recognition of PTSD/PTMD.

Treating suicidal ideation is important because suicidal ideation is one of the main predictors of suicidal acts. Both psychological and pharmacological treatments can be used to treat suicidal ideation. More studies are needed to develop new treatments for suicidal ideation in individuals with PTMD. It is also important to treat other symptoms of PTMD that may be associated with suicidal behavior, e.g., insomnia.

Pharmacological treatment aimed at improving cognitive symptoms is indicated for war veterans with TBI. Clinicians should facilitate the patient's understanding of the triggering internal and external events as well as the key cognitions that occur at the time of the attempts, thus potentially deactivating the suicide mode and averting self-destructive behavior.

The placebo effect plays a role in the treatment of PTSD and depression [49,50], and consequently may play an important part in the treatment of PTMD. The benefits of therapeutic interventions in patients with PTMD can be enhanced by placebo effects.

Large, longitudinal study on the natural course of PTMD among war veterans, including predictors of relapse and recovery are needed. Such a study should gather data pre-deployment, during deployment, and at multiple time points post-deployment.

Suicide remains a difficult issue to study, whether in a civilian or military context. The exigencies of warfare, however, demand the selection and training of young men (and women in many countries) to commit controlled violence in a rational, emotion-ally-detached manner.

It is extremely important to understand PTMD, to optimize assessment and treatment for people with PTMD, and to identify processes that facilitate recovery from exposure to traumatic events. Every nation, every generation, faces traumas that cause suicide. The world needs to deal with this and it is one thing that the world can come together on.

References


