

PTSD in victims of terroristic attacks – a comparison with the impact of other traumatic events on patients' lives

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Summary

Objectives. To identify possible differences, in terms of duration and severity of Post – Traumatic Stress Disorder, between victims of terrorist attacks and subjects who underwent other types of traumatic events.

Methods. A sample of subjects suffering from PTSD was selected. After a clinical interview aimed at the collection of anamnestic data, CAPS to confirm the diagnosis of PTSD and DTS to assess frequency and severity of post-traumatic symptoms were administered. One-way ANOVA was used in order to compare the differences in the parameters analysed through the DTS scales and its clusters between the victims of terrorist attacks and patients undergone other traumatic events.

Results. The duration of PTSD was 258 +/- 144.9 months for people who underwent a terrorist attack and 41.6 +/- 11.8 months for victims of other traumatic events. As regards the severity of the disorder, the total score of the DTS scale was 65.6 +/- 26.9 in victims of terrorist attacks and 78.2 +/- 28.2 in people who undergone other traumatic events. However, the difference was not statistically significant; Avoidance and Hypervigilance clusters showed an important statistical significance.

Conclusions. No significant differences are present in terms of severity, showing that PTSD is a disabling disorder regardless the type of event that triggers it; however, a significant difference in terms of duration of the disorder leads to reflect on the importance of an early diagnostic process aimed toward the victims of terrorism, in order to avoid the risk of chronicity and progression to other psychiatric disorders such as depression.

Key words: PTSD, terrorist attack, traumatic event

Introduction

The Posttraumatic Stress Disorder is an anxiety disorder, often chronic and highly disabling, which can occur in people who have been exposed to traumatic events, first-hand experienced, or happened to others and of whom were witnesses. The diagnosis of Posttraumatic Stress Disorder requires that the person has been exposed to a traumatic event in which he experienced, witnessed or was confronted with an event or events that resulted in the death or a threat to life, or a serious injury or a threat to the physical integrity, of himself/herself or others. In addition to trauma, posttraumatic disorder is characterized by four symptomatic clusters: the continuous reliving the traumatic event, the persistent avoidance of stimuli associated with trauma (avoiding thoughts, conversations, people, places that recall the trauma), symptoms of numbing (amnesia for some aspects of the trauma, reduction of general interest, sense of foreshortened future, feeling of detachment or estrangement, reduced affection) and an arousal increase. Table 1 presents diagnostic criteria for PTSD in DSM-5.

Table 1. Diagnostic criteria for PTSD in DSM-5

<p style="text-align: center;">Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:</p> <p style="text-align: center;">Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).</p> <p style="text-align: center;">Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).</p> <p style="text-align: center;">Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring.</p> <p style="text-align: center;">Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</p> <p style="text-align: center;">Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</p>
<p style="text-align: center;">Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:</p> <p style="text-align: center;">Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).</p> <p style="text-align: center;">Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).</p>
<p style="text-align: center;">Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:</p> <p style="text-align: center;">Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).</p> <p style="text-align: center;">Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (e.g., "I am bad," "No one can be trusted," "The world is completely dangerous," "My whole nervous system is permanently ruined").</p>

table continued on the next page

<p>Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.</p> <p>Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).</p> <p>Markedly diminished interest or participation in significant activities.</p> <p>Feelings of detachment or estrangement from others.</p> <p>Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).</p>
<p>Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:</p> <p>Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.</p> <p>Reckless or self-destructive behavior.</p> <p>Hypervigilance.</p> <p>Exaggerated startle response.</p> <p>Problems with concentration.</p> <p>Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).</p>
<p>Duration of the disturbance is more than 1 month.</p>
<p>The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.</p>
<p>The disturbance is not attributable to the physiological effects of a substance (e.g., medication, alcohol) or another medical condition.</p>

The prevalence of the disorder varies between 1% and 9% in the general population and may reach 50–70% in sub-groups of patients exposed to trauma considered of particular gravity [1], such as war, deportations, torture, assaults or rapes. Lifetime prevalence of PTSD is 3.6% among men and 9.6% among women [2–5]. The scientific literature shows that women are more predisposed to develop PTSD following exposure to trauma [6].

In general, most of the studies on the treatment of PTSD show that psychological therapies have a greater effect than pharmacological ones and a lower drop-out rate [7]. Currently, paroxetine and sertraline are the only medications approved by the Food and Drug Administration (FDA) for treatment of PTSD. If the subjects present sleep disorders, it is recommended the addition of low-dose of trazodone – 50–150 mg in the evening [8, 9], while it would be discouraged the use of benzodiazepines, which seem to have no effect on, or even worse, the responses of fear [10–13]. Mood stabilizers – lithium, carbamazepine and sodium valproate – were tested in the treatment of PTSD in open studies; the results indicate, generically, that these drugs reduce irritability and improve impulse control in patients with PTSD [14–24].

There is a growing number of studies – especially after the World Trade Center terrorist attack of September 11, 2001 – that shed light upon the victims of terrorism

and the onset of PTSD. Although, it has been shown that terrorism may be associated with a greater risk of psychopathology than other disasters [25, 26], and that can affect widely the mental health of the population [27–29]. The field stays quite “young” and the research data are still limited [25].

We established the National Observatory for the Victims of Terrorism at our Department in 2003, at the request of the Italian Association for the Victims of Terrorism and Subversion against the Constitutional Order of the State. After the first contact, the need for care was explained to the patients and to their families; then, a pharmacological and psychotherapeutic program was built, as well as a support network in the city of residence of the patients, focusing on the demonstrated efficacy of integrated therapy for PTSD. Over the years we observed an improvement in the symptomatology, even the disappearance of the diagnosis. In our experience, the institution of a National Observatory has shown to be crucial for Victims of Terrorism, presenting frequently a long duration and an extreme severity of PTSD, but rarely searching spontaneously for help to manage their condition, while an early diagnosis would limit the risk of chronicity and progression in other psychiatric disorders, such as depression.

Aim

In this study we proposed to identify possible differences, in terms of duration and severity of Posttraumatic Stress Disorder, between victims of terroristic attacks and subjects who underwent other types of traumatic events, in a sample of patients relating to our Clinic.

Material and Method

We selected a sample consisting of 84 subjects suffering from PTSD referring to our Clinic from 2003 to 2014. Among patients, 42 were victims of terroristic attacks (war combat, explosions, kidnapping, torture) and 42 victims of other traumatic events (car accidents, hunting accidents, death of loved ones, aggressions, miscarriages, etc.). After a clinical interview aimed at an overall analysis of the state of health and at the collection of anamnestic data, psychometric tests such as the Clinician-Administered PTSD Scale (CAPS) [30] to confirm the diagnosis of PTSD and the Davidson Trauma Scale (DTS) [31] to assess frequency and severity of posttraumatic symptoms, were administered. A possible comorbidity with other psychiatric disorders was excluded by the administration of the Mini International Neuropsychiatric Interview (M.I.N.I.) [32].

Obtained data were collected in an electronic database and processed through the GraphPad 5 Prism software. In particular, one-way ANOVA was used in order to compare the differences in the parameters analyzed through the DTS scales and its

clusters between the victims of terroristic attacks and patients who underwent other traumatic events.

The program of the study was presented to the Ethics Committee and the consent was obtained; 84 patients suffering from Posttraumatic Stress Disorder were recruited among all those relating to the Department of Psychiatry in Siena and to the National Observatory for Victims of Terrorism. For each patient, after obtaining his/her informed consent, socio-demographic information (age, sex, qualifications, work), clinical (any current treatments, previous or current organic disorders) and drug history ones were collected and subsequently psychometric tests in self-and hetero-administration were proposed.

The following tools were used in the study:

- M.I.N.I. – brief structured interview to make the diagnosis of psychiatric disorders, both for the axis I of the DSM-IV and the ICD-10. The tool has a modular structure and each module corresponds to a diagnostic area. For each area, the instrument has one or two preliminary questions (or entrance questions): the negative response to this/these question/s indicates the absence of the corresponding diagnosis and therefore you go to the next module; the positive response to this/these question/s (or at least to one of two questions) indicates the possible presence of the diagnosis and it must be asked, therefore, more questions that are needed to establish the presence or the absence of the criteria according to which that specific diagnosis should be considered. Even within the modules, other items can be met, which on the basis of the answer let you exclude that diagnosis and move to the next module. Because of the possibility of comorbidities, even when the criteria for a diagnosis are satisfied, it is necessary to explore the following diagnostic areas, unless there are no exclusionary criteria as, for example, the generalized anxiety disorder in the presence of any other anxiety disorder.
- CAPS – semi-structured clinical interview, recently adapted to the diagnostic criteria of DSM-IV, which assesses the frequency and the severity of each symptom of PTSD and allows their objectification in order to formulate the diagnosis. There are two forms: one evaluates the current symptoms during last week (One Week Symptom Status Version – SX CAPS) and the other identifies the symptoms currently present or that were present in life (Current and Lifetime Diagnostic Version – DX CAPS). There is a manual that provides default questions for each item of the scale and describes behavioural characteristics. The scale was appropriate for internal consistency, reliability, and validity.
- DTS – it is used for those who have experienced one or more traumatic events. It primarily quantifies the frequency and the severity of symptoms and considers the effects of treatment by measuring the symptoms modifications over time, the response to treatment and the difference between therapeutic choices in research. Faithfully adapted to the DSM-IV, it is composed by 17 items with a total score

which can fluctuate from 0 to 136. The items of evocation and avoidance are related to the event, while those of numbing, of social withdrawal and hypervigilance are evaluated as independent from the event.

Results

We recruited a sample of 84 patients with PTSD referring to our Clinic from 2003 to 2014. The diagnosis was confirmed by meeting all the criteria of the CAPS (mean severity 65.6 +/- 27.6).

The sample includes 38 females (11 victims of terrorism and 27 underwent other events) and 46 males (31 victims of terrorism and 15 underwent other events). The mean age is 45.5 +/- 10.0 years (range 15–74 years), 42.5 +/- 12.2 years in females (range 17–73 years) and 48.5 +/- 12.3 years in males (range 15–74 years). As regards marital status and divorce rate, 18% of victims of terrorism live by alone, 13% are single and 5% are divorced; 11% of victims of other traumatic events live by alone, 8% are single and 3% are divorced. Moreover, 31% of victims of terrorism are married, versus 40% of subject who underwent other events.

The differences in the parameters analyzed through the DTS and its subscales between victims of terroristic attacks and subjects who underwent other traumatic events are summarized in Table 2.

Table 2. Difference in duration of PTSD (months), DTStotal and its clusters scores between victims of terroristic attacks and subjects who underwent other traumatic events

	Months p = 0.001	DTStotal p = 0.152	DTSreexperiencing p = 0.468	DTSavoidance p = 0.003	DTShypervigilance p < 0.001
Victims of Terrorism (31 M; 11 F)	258.2 +/- 144.9	65.6 +/- 26.9	20.4 +/- 9.0	27.1 +/- 13.1	24.8 +/- 8.5
Victims of other events (15 M; 27 F)	41.6 +/- 11.8	78.2 +/- 28.2	22.0 +/- 9.5	26.7 +/- 11.4	26.8 +/- 9.3

Differences in duration, as differences in DTSavoidance and DTShypervigilance, are statistically significant (p < 0.05). Differences in DTStotal and DTSreexperiencing are not statistically significant. M – males; F – females

The duration of PTSD was 258.2 +/- 144.9 months for people who underwent a terroristic attack and 41.6 +/- 11.8 months for victims of other traumatic events (Figure 1).

As regards the severity of the disorder, the total score of the DTS scale was 65.6 +/- 26.9 in victims of terroristic attacks and 78.2 +/- 28.2 in people who underwent other traumatic events, but the difference was not statistically significant.

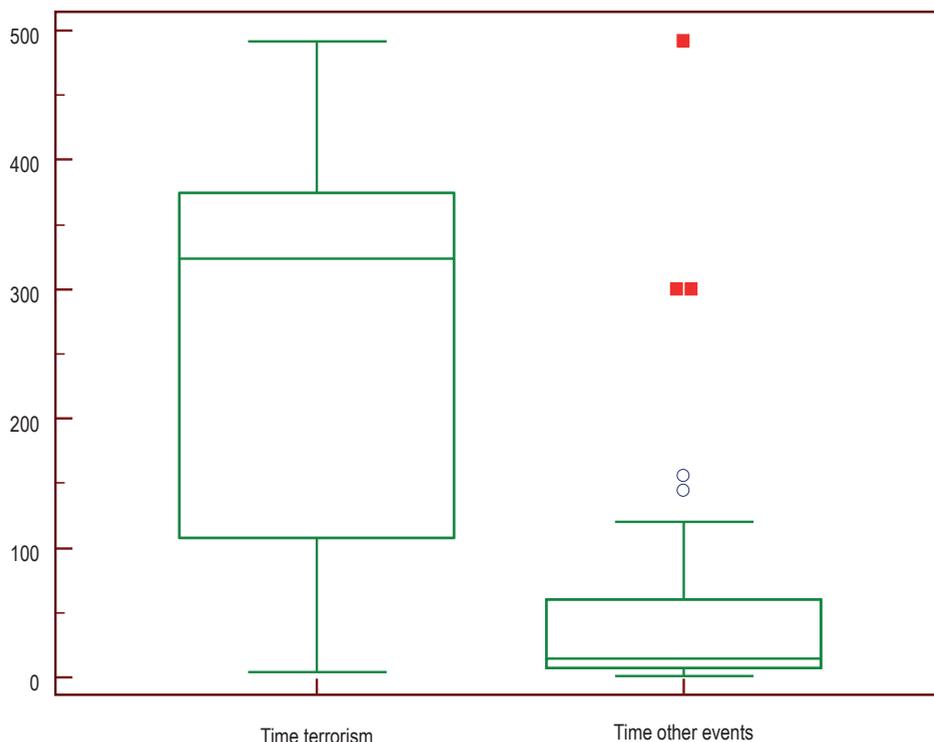


Figure 1. Differences in duration of PTSD (months) between victims of terrorism and victims of other events

$p = 0.001$

The DTS was divided in its symptoms clusters: the cluster “reexperiencing” showed no statistically significant differences between the two groups of patients, unlike the clusters “avoidance” and “hypervigilance”. Avoidance cluster accounted on 27.1 ± 13.1 in victims of terrorism and on 26.7 ± 11.4 in others; the value of $p = 0.003$ showed a statistical significance (Figure 2).

Hypervigilance cluster accounted on 24.8 ± 8.5 in victims of terrorism and on 26.8 ± 9.3 in others; the value of $p < 0.001$ showed again an important statistical significance (Figure 3).

Discussion

Abenham et al. [33] through an epidemiologic survey of 254 survivors of terrorist attacks, which occurred in public places in France between 1982 and 1987 (20 bombings and 1 machine-gun attack), have found that PTSD was present in 10.5% of uninjured

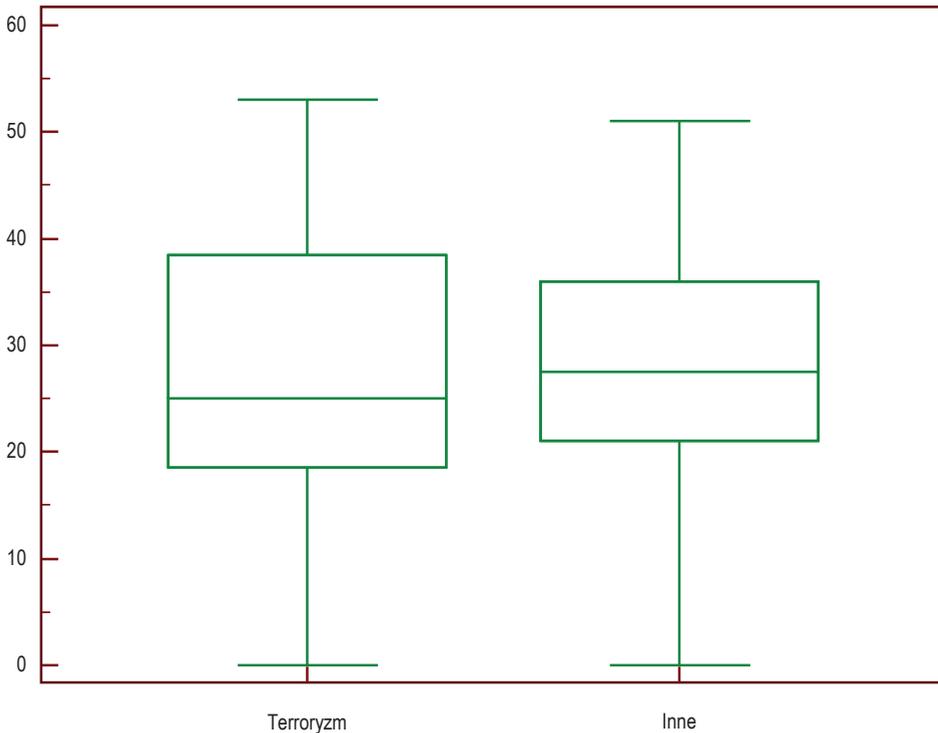


Figure 2. Differences in DTSAvoidance scores between victims of terrorism and people who underwent other traumatic events

$p = 0.003$

victims, 8.3% of moderately injured and 30.7% of severely injured ones. There was no difference in males and females, neither in the age of the victims.

In 1994, North et al., published a study of PTSD among civilian populations exposed to a mass murder spree by a gunman in a cafeteria, in Killeen, Texas [34, 35]. The “Luby’s shooting” took place on 16th October 1991; the perpetrator, George Hennard, crashed his pickup truck through the front of a Luby’s Cafeteria, immediately shot and killed 23 people and wounded 27 others before shooting and killing himself. It is the deadliest mass shooting in America that did not occur at a school. Of the 136 survivors, 20% of men and 36% of women, approximately 1 month after the disaster, met criteria for PTSD. Most subjects who developed PTSD had no history of psychiatric illness. A history of other predisaster psychiatric disorders predicted postdisaster PTSD in women but not in men. One-half of the women and one-fourth of the men with postdisaster PTSD also met criteria for another postdisaster psychiatric diagnosis, especially major depression. Psychopathology was infrequent in subjects without PTSD.

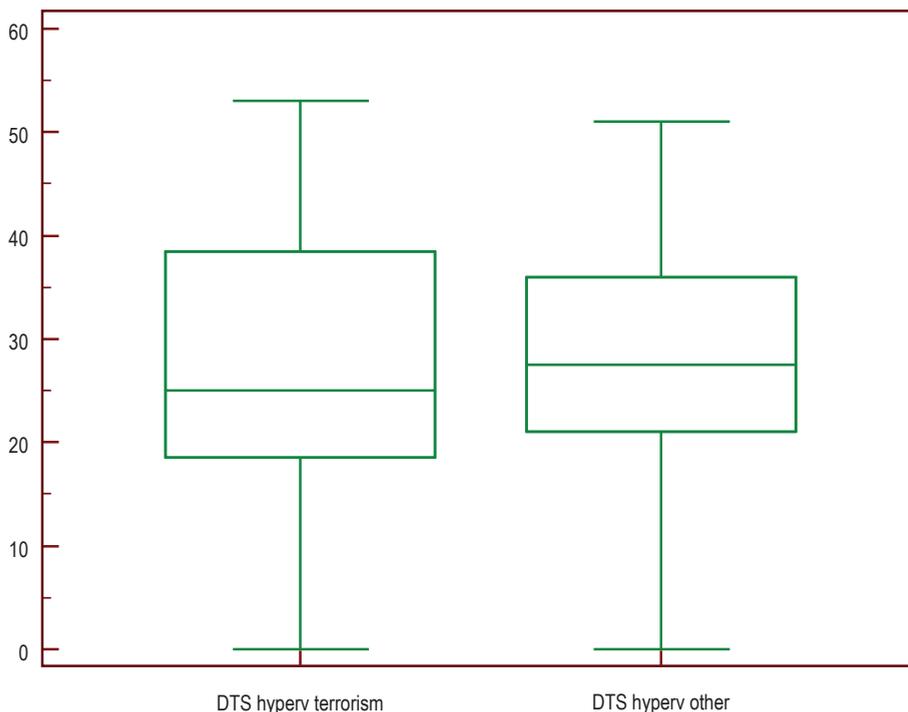


Figure 3. Differences in DTS hypervigilance scores between victims of terrorism and people who underwent other traumatic events

$p < 0.001$

The relationship between terroristic attacks and PTSD was demonstrated after the Oklahoma City bombing, a terrorist bomb attack on the Alfred P. Murrah Federal Building that occurred on April 19 of 1995. The bombing killed 168 people and injured more than 680 others; the blast destroyed or damaged 324 buildings within a 16-block radius, destroyed or burned 86 cars, and shattered glass in 258 nearby buildings, causing an estimated \$652 million worth of damage. This event remains the closest analogue to the events of September 11 available, with 34% of adults in Oklahoma City reporting significant PTSD symptomatology following the bombing. After the Oklahoma City bombing, individuals with a predisaster psychiatric history, who had experienced injury to themselves or to someone they knew, or were female, were more likely to meet symptom criteria for PTSD in comparison with those without these risk factors [36–38].

After September 11, the following risk factors for PTSD were identified: female sex, living close to the World Trade Center; reporting poor social support; reporting a high number of ongoing life stressors; directly witnessing the attack; having a panic attack during the disaster; losing job, possessions, or a loved person; or participating

in rescue efforts. Participants with any of these factors were at greater risk for PTSD than those without risk factors [39, 40].

A study published in 2004 investigated the mental and somatic symptoms of 34 victims, 5 years after the Tokyo subway attack. This was an act of terrorism, the most serious attack to occur in Japan since the end of World War II, directed against trains passing through Kasumigaseki and Nagatachō, home to the Japanese government, perpetrated on 20th March 1995 in Tokyo by members of the religious movement Aum Shinrikyo; 12 people were killed, 50 severely injured and nearly 1000 others reported temporary vision problems. The study showed a total of 11 victims with diagnosis of current or lifetime PTSD according to CAPS. Victims with PTSD showed higher anxiety levels and greater visual memory impairment [41]. Cheapman et al., in a study of 2011, have investigated the prevalence of self-reported impairment as part of a probable DSM-IV diagnosis of PTSD within a sample of 1001 Israeli Jews subject to direct and indirect exposure to rocket attacks [42]. 29% of them reported impairment but only 19% of those met criteria for probable PTSD.

In a recent study, published in 2010, PTSD among 3,271 civilians who evacuated World Trade Center Towers 1 and 2, on September 2001, has been investigated. 95.6% of survivors reported at least 1 current PTSD symptom. DiGrande et al, have estimated the probable rate of PTSD at 15%. Women and minorities were at higher risk of PTSD and a strong inverse relation with annual income was also observed. The authors concluded that five characteristics of direct exposure to the terrorist attacks independently predicted PTSD: being on a high floor in the towers, initiating evacuation lately, being caught in the dust cloud that resulted from the tower collapses, personally witnessing horror and sustaining an injury [43].

Ahern et al. examined the probability of television viewing to be associated with PTSD. Among 2001 respondents to a random-digit dial telephone survey conducted 4 months after September 11, people who viewed more television images in the 7 days after September 11 had more probable PTSD [44]. This hypothesis has been also confirmed by the results of Kinzie et al.'s, study [45] where it has been demonstrated that many patients from Vietnam, Cambodia, Laos, Somalia and Bosnia had severe reactions such as nightmares, flashbacks and depressive symptoms after the extensive TV coverage of 9/11 attack. Encouraging patients to turn off the TV was very therapeutic.

Gabriel et al., in 2007, published a study on the victims of the terroristic attack in Madrid, on March 11th 2004, which describes a high prevalence of major depression and anxiety disorders among survivors [46].

There are no sufficient research data which compare victims of terrorist attacks and other events. Shalev and Freedman [47] have evaluated 39 survivors of terrorist attack and 354 survivors of motor vehicle accidents, upon admission to a general hospital emergency room and 1 week and 4 months later. The results of this study showed that

survivors of terrorist attack had higher rates of PTSD than motor vehicle accident survivors (37.8% versus 18.7%). In addition, the type of traumatic event did not add to the prediction of PTSD from the emergency room heart rate and the peritraumatic dissociation symptoms; moreover, the longitudinal course of early PTSD symptoms was not affected by the greater frequency of terroristic attacks.

As regards our clinical experience, a sample of subjects suffering from Post-traumatic Stress Disorder was recruited among all those relating to the Department of Psychiatry in Siena and to the National Observatory for Victims of Terrorism. The sample distribution is not in line with the data from the literature – that report a prevalence of the disorder in females – as regards the victims of terrorism, but totally in agreement with the scientific literature as regards the victims of other traumatic events; furthermore, females who were victims of terrorism, were more frequently witnesses of attacks involving relatives.

Our results show a significant difference in PTSD duration but not in severity between victims of terrorism and victims of other events. We can explain these data as follows. In most cases, those who experienced an attack do not consider their emotional reaction as a pathological state, considering it a justified reaction towards the experienced trauma, and do not refer to the psychiatrist for their symptoms but after years of suffering, so the diagnosis of PTSD is significantly delayed. The trigger for the disorder is a traumatic event that finds the subject unprepared to handle it, regardless of the type of experienced trauma; this could account for the non significant difference, in terms of severity, between the two groups of patients, a finding that contradicts the limited data so far present in literature [47].

Victims of terrorism showed higher scores in DTSavoiding cluster than victims of other events, the latter showing higher scores in DTShypervigilance cluster, because of the significantly longer duration of the disorder in this category of subjects. Along the clinical course of PTSD it is not infrequent that, on initial hypervigilance symptoms, emotional numbing and affective detachment gradually prevail, for some kind of “emotional exhaustion”.

In this regard, we proposed to analyze even the divorce rate in PTSD patients, in order to find a possible difference between the two groups. Although 31% of victims of terrorism are married (versus 40% of subject who underwent other events), quarrels and misunderstandings that undermine the peace of the family are considerably more marked in the first case, due to the frequent attacks of anger and the affective detachment felt by the patients towards their relatives. Subjects who experienced a different type of trauma report almost no negative changes in family relationships: they often undergo, instead, a strengthening in the relations and find comfort in their difficult situation.

Conclusions

Posttraumatic Stress Disorder can occur in subjects who underwent a traumatic experience. A few studies in literature state that there is a significant difference, in terms of severity of the disorder, between victims of terrorism and people who experienced other types of events, but our clinical experience denied this data. An explanation for this may be that most studies have focused on a single type of event without comparing their effects on the victims. From our study it emerged that no significant differences are present in terms of severity, showing that PTSD is a disabling disorder regardless the type of event that triggers it; but a significant difference in terms of duration of the disorder leads to reflect on the importance of an early diagnostic process aimed toward the victims of terrorism, in order to avoid the risk of chronicity and progression to other psychiatric disorders such as depression. We already responded to this problem by establishing a National Observatory for the Victims of Terrorism and, through our preliminary study, despite the limitations due to the small and heterogeneous sample of patients, we hope to raise awareness on this topic all the professionals that are confronted with it.

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