Post-traumatic stress disorder

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Post-traumatic stress disorder is a psychological disorder which develops following exposure to trauma, and is diagnosed only after four weeks have elapsed. The characteristic features are persistent re-experiencing of the event, avoidance of stimuli associated with the trauma, and symptoms of increased arousal. Its prevalence in the general population is around 1%, and risk factors for developing it include pre-existing psychological morbidity.

Very little is known about the psychological consequences of accidents. Following injury, there is a whole range of physical, social, and psychological sequelae that interrelate and have a direct bearing on recovery. Some psychological sequelae are well recognised, such as anxiety, depression, panic disorders, specific phobias, and post-traumatic stress disorder. In this article we shall for the most part focus on post-traumatic stress disorder and its relevance to accident and emergency (A&E) medicine. However, some of the other disorders mentioned (for example, travel anxiety) may be more common to our practice and need to be acknowledged.

The rates of post-traumatic stress disorder following incidents related to sport, occupations, and road accidents varies according to different studies from 1% to 46%, highlighting the need for further research. There may be some predisposing factors that influence the development of psychological problems following injuries.

Development of post-traumatic stress disorder as a diagnostic entity

It was not until the late 19th and early 20th centuries that health care professionals began studying the human reactions to extreme stress. In 1882 John Erichsen described the symptoms of post-traumatic stress disorder in patients involved in rail accidents, labelling these as "railway spine". This condition was later used by litigants to claim compensation for symptoms which appeared to have no physical basis.

Large numbers of casualties occurring during the two world wars and from industrial accidents prompted professionals to investigate and explain the extreme emotional disturbances sometimes seen. Traumatic stress reactions were described in various forms, most commonly "shell shock" during the first world war, when some men were observed to suffer catastrophic reactions following exposure to explosions.

More recently there has been a surge of interest in post-traumatic stress, particularly following studies on Vietnam war veterans in the USA and Holocaust survivors after the second world war, leading to its formal descrip-

tion in 1980 by the American Psychiatric Association, and publication in the third edition of the *Diagnostic and statistical manual of mental disorders* (DSM III).¹ Since then the criteria have been revised in the updated versions of the manual as DSM III-R in 1987 and DSM IV in 1994 and is also now classified in the *International classification of mental and behavioural diseases*, 10th edition.²

Definition of post-traumatic stress disorder

Post-traumatic stress disorder is defined as the development of a characteristic symptom complex in certain individuals consisting of persistent re-experiencing of an event, avoidance of stimuli associated with the event, and symptoms of increased arousal. The criteria for diagnosis are shown in table 1 as defined by DSM IV.

Importance of the stressor

An event which may precipitate post-traumatic stress disorder is described as a *traumatic stressor* in which the individual experiences intense fear, helplessness, or horror. In post-traumatic stress disorder, the stressor may involve actual or threatened death or serious injury, the witnessing of death, injury, or threat to the physical integrity of another person, or learning about the death, serious harm, or threat of death or injury to a family member or close associate. Many different types of stressor may lead to the development of symptoms, for example rape, road traffic accidents, torture, natural disaster, or physical assault.

Other criteria involved in diagnosis

To make a diagnosis of post-traumatic stress disorder, *all* the criteria in table 1 must be fulfilled, which means that the diagnosis is made on an all or nothing basis, rather than on a sliding scale of symptoms. However, individuals may present with some of the symptoms in smaller clusters, thereby not fulfilling all the criteria for a diagnosis of post-traumatic stress disorder, but still experiencing some psychological distress.

The controversy

There is controversy among some professionals about whether post-traumatic stress disorder exists at all. It is a relatively new diagnosis and some of the criteria have been challenged, for instance Feinstein and Dolan³ have questioned the importance of the stressor causing symptoms of intense fear, helplessness, or horror in the development of symptoms. This is an area where more investigation is needed to confirm or refute such a question.

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Table 1 Diagnostic criteria for post-traumatic stress disorder

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- A. The person has been exposed to a traumatic event in which both of the following were 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.
- B. The traumatic event is persistently re-experienced in one (or more) of the following ways:
- (1) Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.
 - (2) Recurrent distressing dreams of the event.
 - (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 waking or when intoxicated).
 - (4) Intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.
 - (5) Physiological reactivity on exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.
- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
- (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, for example unable to have loving feelings.
 - (7) Sense of foreshortened future, for example does not expect to have a career, marriage, children, or a normal life span.
- D. Persistent symptoms of increased arousal (not present before), as indicated by two (or more) of the following:
- (1) Difficulty falling or staying asleep.
 - (2) Irritability or outbursts of anger.
 - (3) Difficulty concentrating.
 - (4) Hypervigilance.
 - (5) Exaggerated startle response.
- E. Duration of the disturbance is more than one month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
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The diagnosis has been embraced by the legal profession in their pursuit of compensation claims, where malingering for financial gain has long been assumed to be a significant problem and the condition "compensation neurosis" has been described. This involves exaggeration of symptoms, a worse outcome than in those not claiming compensation, and the improvement of symptoms on settlement. Miller^{4,5} found that patients who were less skilled or from more poorly educated backgrounds were more strongly represented among compensation neurosis cases, and that those with less work satisfaction were more likely to seek gain from compensation. Mayou, in a recent paper⁶ following up 188 consecutive road accident victims, has suggested that use of a term such as "compensation neurosis" is rarely appropriate as the condition is far less common than is often claimed in compensation proceedings. In addition, Cornes,⁷ studying 609 accident victims after moderate or severe injury, all making claims, found that 71% returned to work before the claim was settled, and that of those who did not, only 8% were thought to have compensation neurosis. Tarsh and Royston,⁸ following up 35 individuals claiming compensation after accidents that caused severe disability, found a lack of improvement in the symptoms after their claims were settled, reinforcing the argument that victims rarely simulate symptoms for financial gain.

Predisposing factors for post-traumatic stress disorder in the general population

Epidemiological studies of the prevalence of post-traumatic stress disorder are rare and depend on local understanding of the reactions to trauma in clinical practice. Those performed to date⁹⁻¹⁴ provide an insight into the disorder and reveal gaps in our knowledge, suggesting that further studies are required to identify those individuals most at risk. All the studies

found strong associations of post-traumatic stress disorder with other psychiatric disorders such as depression, anxiety disorders, and substance abuse. They also found a slightly higher incidence among women⁹⁻¹³ and among individuals with family histories of psychiatric illness or early parental separation.⁹⁻¹¹ Events most likely to precipitate post-traumatic stress disorder in the general population included seeing someone seriously hurt or killed, physical attack, and combat situations.

Post-traumatic stress disorder and accidents

Very little is known about the psychological reactions of accident victims who might present to the A&E department following injury. There have been some studies in recent years attempting to assess the range and extent of psychological problems after accidents. However, these studies have been very limited in some respects, and there is a great need for further research.

PREVALENCE

Data on prevalence of post-traumatic stress disorder among accident victims are given in table 2.

During 1994 50 181 people were killed or seriously injured as a result of road traffic accidents.¹⁵ Many more sustained less significant physical injuries, but their experiences can cause sufficient psychological damage to have a severely debilitating effect on their lifestyle. The sequelae of injury are often not only experienced by the individual and their immediate family and friends, but by society as a whole in the form of disruption to family structure, occupation, and increased dependence on state support. It is not only road accident victims who suffer; individuals injured at work or play are equally susceptible. During the period 1994 to 1995 a total of 109 738 men sustained occupational or industrial injuries, of which

Table 2 Prevalence of post-traumatic stress disorder (PTSD) among accident victims in studies to date

Study	Subjects	Rates of PTSD
Blanchard <i>et al</i> , 1994 ¹⁷	50 RTA victims	46%
Mayou <i>et al</i> , 1993 ¹⁸	188 RTA victims	11%
Feinstein and Dolan, 1991 ³	45 Fractured leg	14.5%
Malt, 1988 ²⁰	107 accidents	1%

RTA, road traffic accident.

176 were fatal.¹⁶ Although with the advent of improved health and safety regulations there has been a general decrease in mortality and morbidity, these numbers still represent a significant proportion of the working population.

In 1994 Blanchard *et al*¹⁷ published the results of work they had done with 50 road traffic accident victims who had sought medical attention, and compared these individuals to 50 non-accident controls. He found that 46% of the victims met the criteria for post-traumatic stress disorder and a further 20% had what he described as a "subsyndromal form." In contrast, Mayou *et al*¹⁸ in 1992 studied the psychological sequelae of road accidents among three representative groups ($n = 188$), car occupants, motorcycle riders, and whiplash injury victims. They followed these patients up over a year and found post-traumatic stress disorder in around 11% of victims, with a further 18% experiencing an acute distress syndrome characterised by anxiety or depression.

Feinstein and Dolan followed up 48 accident victims admitted after lower limb fracture over a six month period, interviewing them on three occasions, and found that within days of the accident over 60% of patients could be classed as "psychiatric cases," but this number had decreased to 25% by six weeks, and to 21% by six months. In addition, post-traumatic stress disorder was noted in 14.5% of patients at six months. The study also suggested that early return to work was beneficial, since those patients who had done so by six weeks after their accident had less psychiatric morbidity; however, this distinction was not present at six months.^{3 19}

Malt interviewed a group of 107 trauma patients on admission and followed them up six to nine months later. He found that 16.8% of the group had a non-organic psychiatric disorder during the follow up period, but found post-traumatic stress disorder in only 1% of patients.²⁰

Roca and Spence interviewed 43 burns patients and followed them up over a four month period for signs of psychological distress. They found that 7.1% met the post-traumatic stress disorder criteria at around one month, with 22.6% meeting them at four months. They commented that individual symptoms were more common than post-traumatic stress disorder itself.²¹

COMORBIDITY IN ACCIDENT VICTIMS

Mayou *et al* in 1992, following his prospective study of 188 road accident victims, observed that there appeared to be an overlap between

emotional distress, post-traumatic stress disorder, and phobic anxiety.¹⁸ Blanchard and Hickling, in a study of 20 road accident victims, found an increased comorbidity of other psychiatric disorders among patients with post-traumatic stress disorder. These included major depressive illness, simple phobias, and dysthymic disorders (a form of chronic depression).²²

Interestingly, Blanchard and Hickling also found that 50% met the criteria for post-traumatic stress disorder and 60% met the criteria for a travel anxiety, indicating that not only are post-traumatic stress disorder symptoms often linked to other disorders, but that problems such as travel anxiety can be more prevalent and possibly more disruptive than post-traumatic stress disorder symptoms.²² Changes in driving behaviour as a result of road accidents are well documented. Travel anxiety constitutes an avoidance or reduction in driving or travel in a vehicle, associated with marked subjective discomfort when such travel has to be endured. In 1994, reporting on the same consecutive group of patients as in the 1992 study,¹⁸ Mayou and Bryant commented that a return to driving by injured people can be delayed for medical, financial, or legal reasons. They found that 63% of motorcyclists were either not riding at all or had changed to driving a car. Several patients expressed a wish to drive a safer car and stated that they were more cautious and alert to dangers around when driving. These driving concerns were present in 65% of drivers one year after the accident. They did not correlate with severity of injury or premorbid psychopathology, but seemed to be concerned with initial "horrific memories" of the accident.²³

PREDISPOSING FACTORS

Up to now only a few studies have suggested factors that may predict those individuals who will go on to develop problems with post-traumatic stress disorder after an accident. These factors can broadly be described as being either related to the event (for example, the nature of the accident, the type and range of injuries), or to characteristics specific to the individual.

Event

- The nature of the stressor and perceived stressfulness of the event were not found to be important as discriminating variables.^{3 19}
- Those victims suffering more extensive injury were found to be at increased risk from developing post-traumatic stress disorder after road traffic accidents.^{24 25}
- The development of post-traumatic stress disorder did not correlate with the severity of the injury following a burn.²⁶
- Patients who were unconscious after an accident did not develop post-traumatic stress disorder,¹⁸ though a single case study reported post-traumatic stress disorder developing in a patient who was unconscious following injury.²⁷

Individual characteristics

- Symptoms of post-traumatic stress disorder in the early stages after injury are likely to predict problems at a later stage.^{3,19}
- Higher than average weekly alcohol intake before injury may predict problems at a later stage.^{3,19}
- A previous history of problem drinking does not correlate with an increase in psychiatric morbidity following an accident.²⁸
- Horrific intrusive memories for the event immediately following injury strongly predict the development of post-traumatic stress disorder.¹⁸
- High levels of emotional distress immediately after injury correlate with the development of post-traumatic stress disorder in the long term.²⁶
- Low levels of perceived emotional support correlate with the development of post-traumatic stress disorder in the long term.²⁶
- Persistent anxiety and depression following trauma are much more likely to occur in patients with high neuroticism scores (as measured by the Eysenck personality inventory) or a history of previous consultation for psychological problems.¹⁸

From these findings, it can be seen that conflicting observations have arisen from the various studies done so far. This can only serve to highlight the need for further investigation. It does seem that the initial level of distress and memory of the event has a significant bearing on the reaction of the individual in the long term. There also appears to be confusion as to the importance of alcohol intake in the development of psychological problems. Interestingly, Noyes found increased numbers of alcoholics involved in road accidents, the number involved increasing with the severity of injury, and being the highest for fatalities.²⁹ Patients convicted of drink-driving tended to have a history of social maladjustment and antisocial behaviour. It is felt that alcohol may enhance personality traits that are responsible for the cause of the accident, rather than physiological impairment being the sole cause.³⁰ Less appears to be known about the effects of drug abuse on driving behaviour, although this is receiving increased attention.

Conclusion

Post-traumatic stress disorder became a diagnostic entity in 1981, but since then very little has been observed about the range and extent of individual reactions to everyday trauma and how the physical injury interrelates with social and psychological factors. In this article we have summarised some of the research done so far. However, this seems to have raised as many questions as it has answers about the incidence of post-traumatic stress disorder and why some individuals fall victim to the disorder while others do not. More work is needed to identify the predisposing factors for post-traumatic stress disorder and to target those individuals who appear to be at risk.

Summary

Post-traumatic stress disorder is an anxiety disorder that can develop following exposure to a traumatic event. The symptoms are of persistent re-experiencing of the event, avoidance of situations associated with the event, and symptoms of increased arousal. It was first described following studies on Vietnam war veterans and Holocaust survivors in 1981. In this article we have examined the impact of this disorder on accident victims attending A&E departments by reviewing the studies done so far. The results suggest that the rates of post-traumatic stress disorder after injury vary enormously, from 1% to 46%, indicating very little is certain about how the physical effects of injury interrelate with the social and psychological effects. Factors predisposing to post-traumatic stress disorder may be the initial distressing memories of the event, previous high alcohol intake, and coexisting psychiatric problems. However, some of the observations made in these studies seem to conflict, suggesting further studies are needed.

- 1 American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*, 4th ed. Washington DC: American Psychiatric Association, 1994.
- 2 World Health Organisation. *International classification of mental and behavioural diseases: clinical description and diagnostic guidelines*, 10th ed. Geneva: WHO, 1992.
- 3 Feinstein A, Dolan R. Predictors of post-traumatic stress disorder following physical trauma: an examination of the stressor criterion. *Psychol Med* 1991;21:85-91.
- 4 Miller H. Accident neurosis. *BMJ* 1961;i:992-8.
- 5 Miller H. Accident neurosis. *BMJ* 1961;i:919-25.
- 6 Mayou R. Medico-legal aspects of road traffic accidents. *J Psychosom Res* 1995;39:789-98.
- 7 Cornes P. Return to work of road accident victims claiming compensation for personal injury. *Injury* 1992;23:256-60.
- 8 Tarsh MJ, Royston C. A follow-up study of accident neurosis. *Br J Psychiatry* 1985;146:18-25.
- 9 Breslau N, Davis GC. Post traumatic stress disorder in an urban population of young adults. Risk factors for chronicity. *Am J Psychiatry* 1992;149:671-5.
- 10 Breslau N, Davis GC, Andreski P. Traumatic events and post traumatic stress disorder in an urban population of young adults. *Arch Gen Psychiatry* 1991;48:216-22.
- 11 Helzer JE, Robins LN, McEvoy L. Post-traumatic stress disorder in the general population. *N Engl J Med* 1987;317:1630-3.
- 12 Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the national comorbidity survey. *Arch Gen Psychiatry* 1995;52:1048-60.
- 13 Davidson JRT, Hughes D, Blazer DG, George LK. Post-traumatic stress disorder in the community: an epidemiological survey. *Psychol Med* 1991;21:713-21.
- 14 Wolfe J, Keane TM. New perspectives in the assessment and diagnosis of combat-related post traumatic stress disorder. In: Wilson JP, Raphael B, eds. *International handbook of traumatic stress syndromes*, 1st ed. New York: Plenum Press, 1993:157-64.
- 15 Department of Transport. Male casualties by road user type and severity 1987-1994. In: *Road accidents Great Britain*. London: Department of Transport, 1996.
- 16 Health and Safety Executive Commission. Injuries to male employees 1989-1995. In: *Health and safety statistics, 1994/1995*. London: Health and Safety Executive Commission, 1995.
- 17 Blanchard EB, Hickling EJ, Taylor AE, Loos WR, Gerardi RJ. Psychological morbidity associated with motor vehicle accidents. *Behav Res Ther* 1994;32:283-90.
- 18 Mayou R, Bryant B, Duthie R. Psychiatric consequences of road traffic accidents. *BMJ* 1993;307:647-51.
- 19 Feinstein A. A prospective study of victims of physical trauma. In: Wilson JP, Raphael B, eds. *International handbook of traumatic stress syndromes*, 1st ed. New York: Plenum Press, 1993:157-64.
- 20 Malt U. The long-term psychiatric consequences of accidental injury. A longitudinal study of 107 adults. *Br J Psychiatry* 1988;153:810-8.
- 21 Roca RP, Spence RJ, Munster M. Posttraumatic adaptation and distress among adult burn survivors. *Am J Psychiatry* 1992;149:1234-8.
- 22 Hickling EJ, Blanchard EB. Post traumatic stress disorder and motor vehicle accidents. *J Anxiety Disord* 1992;6:285-91.

- 23 Mayou R, Bryant BM. Effect of road traffic accidents on travel. *Injury* 1994;25:457-60.
- 24 Blanchard EB, Hickling EJ, Mitnick N, Taylor AE, Loos WR, Buckley TC. The impact of severity of physical injury and perception of life threat in the development of post traumatic stress disorder in motor vehicle accident victims. *Behav Res Ther* 1995;33:529-34.
- 25 Blanchard EB, Hickling EJ, Vollmer AJ, Loos WR, Buckley TC, Jaccard J. Short term follow up of post traumatic stress symptoms in motor vehicle accident victims. *Behav Res Ther* 1995;33:369-77.
- 26 Perry S, Difede JA, Musgni G, Frances AJ, Jacobsberg L. Predictors of post traumatic stress disorder after burn injury. *Am J Psychiatry* 1992;149:931-5.
- 27 McMillan TM. Post-traumatic stress disorder and severe head injury. *Br J Psychiatry* 1991;159:431-3.
- 28 Mayou R, Bryant B. Alcohol and road traffic accidents. *Alcohol Alcoholism* 1995;30:1-3.
- 29 Noyes R. Motor vehicle accidents related to psychiatric impairment. *Psychosomatics* 1985;26:569-82.
- 30 Waller JA. Impaired driving and alcoholism: personality or pharmacological effects? *J Safety Res* 1969;1:174-7.

EMERGENCY CASEBOOK

Bilateral traumatic anterior dislocation of the hip joint

Bilateral anterior dislocation of the hip is exceedingly rare, six cases having been reported.¹⁻⁵ Only one of these cases resulted from a road traffic accident³: the authors considered that the dislocation could have been prevented if a seat belt had been worn. We report a case of a patient who sustained bilateral hip dislocation in a road traffic accident despite wearing a seat belt. A 1.83 m, 85 kg boy of 15 years was the front seat car passenger involved in a head on collision with a tree at 40 mph. At the time of impact the patient was slouching in his seat; he slid underneath his seatbelt, and his knees hit the dashboard producing extreme abduction of his hips. On admission both hips were flexed to 80°, externally rotated, and abducted to 45°. Radiographs showed bilateral anterior dislocation of the hips (fig 1). Reduction was achieved under general anaesthesia, by hip flexion, traction, and adduction with an assistant stabilising the pelvis. Skin traction was applied for 12 days. Gentle mobilisation was allowed after 16 days. It is believed that the slouched sitting position meant that the patient slid underneath the seatbelt and that, because of his height and size, the lower limbs came into contact with the dashboard more easily. Sitting upright with the lower strap of the seat belt running around the anterior superior iliac spines could have prevented this dislocation.

Figure 1 AP x ray of the pelvis showing bilateral anterior dislocation of the hips.

- 1 Aggarwal ND, Hardas S. Unreduced anterior dislocation of the hip. *J Bone Joint Surg Br* 1967;49-B/2:288-92.
- 2 Gibbs A. Bilateral obturator dislocation of the hip joint. *Injury* 1980;12:250-1.
- 3 Zamon MH, Saltzman DI. Bilateral traumatic anterior dislocation of the hip. *Clin Orthop* 1981;161:203-6.
- 4 Tezcan R, Erginer R, Babacan M. Bilateral traumatic anterior dislocation of the hip: brief report. *J Bone Joint Surg Br* 1988;70B/1:148-9.
- 5 Endo S, Hoshi S, Takayama H, Kan E. Traumatic bilateral obturator dislocation of the hip joint. *Injury* 1991;22/3:232-3.

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