

Header strap: trauma

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Psychological stabilisation for MVC victims

Erik De Soir and Koen Goffings say that emergency medical staff, rescue personnel and fire services may be the most underestimated actors in preventing psychological trauma during extrication operations

Scientific research indicates that victims of motor vehicle accidents (MVAs) may develop psychological trauma owing to contextual aspects such as the life-threatening character of severe traffic accidents. Post Traumatic Stress Disorder (PTSD) is frequently seen after MVAs. PTSD implies not only a considerable strain on the victims' quality of life, but is also a substantial economic burden for the society, since it may lead to a significant increase in psychiatric treatment.

The 'rescue squirrel method' is when a firefighter-paramedic, certified in emergency crisis response and advanced psychological support, provides emergency medical and psychological stabilisation for victims trapped in a vehicle after an MVA. The name 'squirrel' refers to the characteristics of these first responders: quick, swift, intelligent, action-oriented and gentle. For this article, the method is assessed on the effect it has on the victims' vital parameters (heart rhythm, respiratory frequency and blood pressure) and psychological experience during the rescue operations.

PTSD is frequently seen after traumatic experiences such as severe accidents, rape, torture, violence and war. In developing PTSD, a person must have been exposed to a traumatic event in which both of the following were present: The person experienced, witnessed, or was confronted with an event(s) that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others; and the person's response involved intense fear, helplessness or horror.

PTSD is determined by three major clusters of symptoms. The first cluster concerns persistent re-experience, such as: Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions; recurring dreams of the event; acting or feeling as if the traumatic event were recurring; intense psychological distress at exposure to cues that symbolise or resemble an aspect of the traumatic event; and physiological reactivity on exposure to such cues.

The second cluster of symptoms concerns persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following symptoms: Avoiding thoughts, feelings, or conversations associated with the trauma; efforts to avoid activities, places, or people that arouse recollections of the trauma; inability to recall an important aspect of the trauma; markedly diminished interest or participation in significant activities; feeling detachment or estrangement from others; and restricted range of affect, and/or a sense of foreshortened future.

The third cluster of symptoms consists of two or more of the following: Difficulty falling or staying asleep; irritability or outbursts of anger; difficulty concentrating; hyper vigilance; and exaggerated startle response.

If the duration of the above symptoms is more than a month, and the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning, the diagnosis of PTSD is confirmed.

A person may also suffer from Acute Stress Disorder (ASD) when these symptoms last between two days and a maximum of four weeks, directly following the traumatic event. The ASD diagnosis also requires symptoms of dissociation, such as derealisation, depersonalisation, dissociative amnesia and a reduction in awareness in their surroundings (eg 'being in a daze'). Incidence and lifetime prevalence rates of PTSD in the general population are around one and nine per cent respectively. Predicting the potential onset of PTSD has been examined in a number of studies. Peritraumatic dissociation and acute stress symptoms are both variables that can predict subsequent PTSD symptoms. Thus, assessing immediate dissociative experiences and acute stress symptoms help the clinician identify traumatised victims who are at high risk of developing PTSD.

Subjects with peritraumatic dissociation are over four times more likely to experience acute PTSD and nearly five times more likely to develop chronic PTSD. The risk of chronic PTSD is similar to that found in studies of combat veterans and disaster workers and underscores the clinical importance of assessing peritraumatic dissociation after MVAs. Importantly, after adjusting for prior PTSD, peritraumatic dissociation remained a significant risk factor for acute and chronic PTSD. Therefore, prior PTSD and peritraumatic dissociation appear to be independent risk factors. This suggests that the most common peritraumatic symptom is a sense of time change during the event.

One study mentions that peritraumatic dissociation appears to be gender specific, which could explain the different risk for PTSD in women and men, increasing the risk for PTSD significantly more in women. The exact mechanism of peritraumatic dissociation cannot be reduced merely by an avoidance response to trauma-related emotional distress, at least in terms of its relationship to PTSD. It must be stated that it is not only peritraumatic dissociation that plays an important role; persistent dissociation can have an even greater part in the development of PTSD.

Research also indicates that an initial elevated heart rate (both during EMS transport and after admission) in adolescents and children who are victims of an MVA, may be a potential marker for increased risk in developing PTSD. In adults, current findings suggest that there is preliminary evidence for the role of Emergency Department (ED) heart rate in predicting ASD symptom severity, and that ED heart rate can predict chronic PTSD symptom severity depending on how long post-trauma PTSD is assessed.

MVAs trigger the orthosympatic nerve system (owing to their characteristics), which has the sole purpose of survival; physical symptoms of this activation are hypertension, tachycardia and pale skin. For this study a specific training package was developed. The first responders from emergency medical and fire services received fire squirrel training, ie a course in psychological stabilisation skills, based on hypnotic techniques for arousal, pain and anxiety reduction. With this training, first responders learned how to anticipate the direct needs of MVA victims in order to decrease the peritraumatic discomfort, reduce fear, pain and disorientation with the aim of minimising the development of subsequent psychological trauma. This approach might lead to a reduced morbidity (psychical and psychological) and mortality rate in critically injured patients both in the short and long term.

For this reason, the direct effect of the psychological intervention on vital parameters was measured. If the heart rate, blood pressure and breathing rate can be lowered through psychological stabilisation, it appears to be logical that the natural compensation mechanisms of the body, which may increase mortality and morbidity, may be avoided.

PERMISSIVE HYPOTENSION

This effect can be illustrated by the following example: if a person has internal bleeding, his body will react by elevating the heart rate and blood pressure; ie compensatory haemodynamic shock. By doing so, the vital body can continue to work and keep providing blood to the wound. By reducing the heart rate and subsequently the blood pressure, less

blood will be transported to the wound, which will decrease the bleeding. This phenomenon can be referred to as permissive hypotension. The use of permissive hypotension had shown a beneficial effect on patients who have a strong potential for ongoing internal haemorrhage. These patients are managed with a deliberate hypotensive approach until definitive haemostasis has been achieved. This research is the first to be conducted in this particular field concerning trauma support during the event.

In this pilot study not only was the possible beneficial effect on a person's heart rate, blood pressure and breathing frequency a topic, but the psychological burden was also analysed. During the extrication, vital signs were measured at different moments. The presence of ASD/PTSD was assessed through a clinical interview with a trained psychologist using a list of diagnostic criteria specific for each condition. To assess for possible peritraumatic dissociation, psychologists used the Peritraumatic Dissociative Experiences Questionnaire (PDEQ).

When the alarm call is received about an MVA with entrapped victims, the standard operating procedure stipulates that the nearest fire brigade send out a crew, an ambulance crew (in some cases private; two trained paramedics) and a Mobile Urgency Group (MUG; an emergency nurse and an emergency physician) from the nearest specialised medical emergency centre. All equipment for advanced trauma life support is present in the vehicle.

For this study, the rescue personnel received additional training in acute trauma support and psychological stabilisation. To make sure that all techniques learned were used in a correct and standardised way, reminder cards with key support actions were placed within the responders' vehicles. After each accident, rescue personnel took part in a post-mission debriefing, which focused on the use of the fire squirrel technique, as well as the emotions involved using the technique, and there was constant feedback between rescue personnel and researchers.

PARTICIPANTS

This pilot study consisted of seven participants with an average age of 42 years, and all except one completed the study. Patients were excluded from the study if they had been unconscious during the rescue operations, if they had suffered severe traumatic brain injury or if they had a score of eight or lower on the Glasgow Coma Scale (indication for endotracheal intubation). These criteria take into account that victims have to be alert in order to be able to interact with the rescue squirrel.

Quantitative data collection started at the crash site. Ambulance officers and nurses were asked to complete a data set containing measurements concerning blood pressure, Glasgow Coma Scale, heart rate and breathing frequency. All use of medication was registered since narcotic analgesia may have side effects that can interfere with the mental status of the patient.

All study participants were interviewed by a trained psychologist within 72 hours of the accident. The interviews consisted of open-ended questions and statements to score on a five-point Likert scale. During the interview every connotation was reported, as well as exact dialect to fully grasp any emotion behind a particular word. Pre-MVA psychiatric status (major depression, mood disorders, anxiety disorder, PTSD and axis I disorder, prior to the event or depressed at time of the MVA), accident-related variables (were others hurt or killed? Amount of responsibility for the MVA) degree of physical injury (using the revised trauma score) and specific demographics (gender and ethnicity) were assessed.

The first results indicated that the traumatic event did not trigger any alterations in a person's heart frequency, despite the potentially traumatising aspects of the extrication procedure (cutting in the wreckage, breaking glass, etc). Analysis of BPM during rescue operations revealed that heart rate did not vary substantially. This could mean that objective cues of danger or threat have not been perceived as such, owing to the intervention of the fire squirrel.

None of the persons developed tachycardia (>120 BPM) during the rescue operations, while in other cases the heart rhythm of MVA victims appeared very instable during the extrication procedure. This might be an important variable that could possibly indicate that the fire squirrel technique offers the opportunity of counteracting the orthosympatic nerve system. The variable blood pressure showed a similar evolution. The variable breathing frequency showed a more positive evolution. Breathing frequency dropped as contact was established with the rescue crew, which indicates that this contact is soothing and calming to the entrapped victim. In training there was a strong emphasis on the meaning of breathing frequency and the importance of teaching an incarcerated victim how to stay in control of his/her breathing. Most techniques of the rescue squirrel try to intervene on this specific variable.

The post-accident interviews with MVA survivors indicate that most had a strong sense of feeling safe, and even of being in peace. This finding has to be carefully examined and compared within the control group. The statements used by the casualties in the interview showed what aspects of the support they named as important. "Just the fact that he was near me and knew what the others were doing, and that he was talking to me; calmed me down," said a 26-year-old MVA casualty.

As this quote demonstrates, it is imperative that the rescue squirrel stays calm. If a victim notices any distress in one's voice, stress may take the upper hand in the victim. The fact that the rescue squirrel is always both a trained firefighter and a paramedic provides the advantage that they know the techniques of rescuing and freeing a victim from a car. Therefore reducing the effect of surprise and powerlessness for the victim appears to be essential.

The extreme sense of powerlessness was reported by one of the victims and, after review, this feeling was overwhelming in the first minutes after the crash – when the rescue squirrel was not yet operational. Assisting the victims with their breathing, explaining the sequence of the extrication, providing a subjective sense of control and involving them in the extrication process, appears to be very soothing. The rescue squirrel says things like: "Just say yes when you want us to continue... are you okay? You will hear some noise but I'm right beside you."

LOSS OF CONTROL

Easy things, such as protecting victims with a transparent hard plastic board and providing opportunity to stay aware of their environment helps victims to feel safe. Loss of control can induce a more explicit perceived threat since the victim cannot understand the technical manoeuvres in the correct sense.

In each study the participants were asked about the perception of time during the accident. Most victims (four in seven) mentioned a shortened perception of time, and two participants encountered both a shortened and a prolonged perception of time. It could be concluded that the victims reported a prolonged perception before there was any contact with the fire squirrel.

These first findings indicate that it is necessary to start making the difference between 'positive' and 'negative' peritraumatic dissociation, where the fire squirrels induce positive peritraumatic dissociation and may be seen as a buffer against chronification of posttraumatic sequelae.

These preliminary findings are essentially used to convince the leadership of emergency services that simple (hypnotic) techniques for psychological stabilisation can make a world of difference for critically injured MVA victims who have to be extricated. The authors are determined to continue the 'fire squirrel study' and welcome international co-operation in order to be able to carry out a complete randomised and controlled study.

Authors

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The post-accident interviews with MVA survivors indicate that most had a strong sense of feeling safe, and even of being in peace

The nature of road traffic accidents, in that they stimulate the orthosympatic nerve system, means that survivors can be susceptible to Post Traumatic Stress Disorder