The Psychophysiology of Motor Vehicle Accident Related Posttraumatic Stress Disorder

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Heart rate, BP, and electrodermal responses of four individuals with PTSD secondary to motor vehicle accidents (MVAs) were measured while they imagined two separate scenes related to their MVA. Results showed reliable HR responses to these images. In addition, SBP and DBP also showed some responsivity to the images while skin resistance level changed reliably in only 2 of 4 subjects. Psychophysiological measurement could play a role in the assessment and treatment of MVA-related PTSD.

Descriptor Key Words: motor vehicle accidents; posttraumatic stress disorder; psychophysiological responses in PTSD.

One of the most robust findings in the study of Post-Traumatic Stress Disorder (PTSD) among Vietnam veterans is that these individuals (PTSDs), when presented with stimuli reminiscent of combat (audiotapes, videotapes, imagery descriptions), reliably show increased cardiovascular responding (increased heart rate [HR] and blood pressure [BP]) as well as increases in muscle tension (EMG) and changes in electrodermal activity (EDA) (increased skin conductance) (Malloy, Blanchard, Kolb, Pallmeyer, & Gerardi, 1982; Blanchard, Kolb, Gerardi, Ryan, & Pallmeyer, 1986; Blanchard, Kolb, Taylor, & Whitrock, 1989; Fairbank, & Keane, 1983; Pitman et al., 1987, 1990).

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In fact, the findings are so robust that they have been incorporated into the VA’s official diagnostic procedures for PTSD (Gronvall, 1986). A multicenter study (Kolb & Keane, 1988) is currently underway within the VA to document this effect and its differential diagnostic utility.

Although increased arousal is one of the DSM-III-R (American Psychiatric Association, 1987) symptom clusters for the diagnosis of PTSD, the psychophysiological aspects of arousal in individuals with PTSD resulting from noncombat stressors have been little studied. In the current study we sought to learn if the distinctive physiological responding of combat-related PTSDs was also present in victims of PTSD caused by a markedly different stressor, motor vehicle accidents (MVAs).

Motor vehicle accidents are widespread experiences in the USA, resulting in over 47,000 deaths and over 3 million injuries in 1988 (U.S.D.O.T., 1988). Some proportion of MVA victims develop PTSD (Kuch, Swinson, & Kirby, 1985; Modlin, 1967). In the one study of the psychophysiology of MVA-related PTSD that we could locate, McCaffrey and Fairbank (1985) found that one of the two patients studied showed a 1-beat-per-minute (bpm) increase in HR, over a fairly high baseline level, to a pictorial and verbal description of her MVA prior to treatment; the other subject, a male, showed a 5-bpm increase. Both subjects also showed some responsivity in EDA responses.

**METHODS**

**Subjects**

Four individuals (3 female, 1 male) who had sought treatment with a local practitioner (EJH) for MVA-related psychophysiological problems (headaches, pain, etc.) served as participants. All received diagnoses of PTSD based upon the full DSM-III-R criteria. Additional demographic and diagnostic information, as well as a synopsis of their MVA experience, is given on each participant below. All subjects gave written informed consent for the assessment procedures.

S-1 is a married, 47-year-old Black woman, who had been in treatment for a dysthymic disorder/major depression with one of the authors (EJH). She had been close to termination when she was in an automobile accident. While waiting to make a left turn, she was struck head on by a driver who ran the red light and crashed into her car. She was trapped in the car for over a 45-minute period with her children and a companion. She was freed from the automobile and taken to the emergency room of the local medical center. She was treated for cervical and lower back pain, and referred to treatment by