

Clinical Correlations of Posttraumatic Nightmares in Survivors of Motor Vehicle Accidents

Zack Z. Cernovsky, Varadaraj R. Velamoor, Stephan C. Mann, and Larry C. Litman

ABSTRACT

Background: We evaluated the severity and clinical correlates of nightmares of persons injured in high impact motor vehicle accidents (MVAs).

Method: De-identified data of 80 post-MVA patients (mean age 38.9 years, SD=12.8) were available and included scores on Item 2 of the PCL-5 (severity of repeated, disturbing dreams of the stressful event). Scores were also available on the Brief Pain Inventory (BPI), Morin's Insomnia Severity Index (ISI), Rivermead Post-concussion Symptoms Questionnaire, Subjective Neuropsychological Symptoms Scale (SNPSS), Whiplash Disability Questionnaire, and on three questionnaire measures of driving anxiety (Steiner's, Whetstone's, and DAQ). The patients were assessed, on the average, 49.7 weeks (SD=36.3) after their MVA; all still experienced active post-MVA symptoms requiring therapy.

Results: Clinically relevant levels of MVA nightmares were reported by 62.5% of post-MVA patients. Subjectively more aversive levels of MVA nightmares correlated with higher driving anxiety as measured by the Whetstone questionnaire and DAQ, with higher levels of average post-accident pain and insomnia, with post-accident neuropsychological symptoms as measured by the Rivermead and SNPSS, and with higher post-accident levels of depression, anger, and generalized anxiety.

Discussion and Conclusions: Almost two-thirds of our post-MVA patients reported MVA nightmares and their level of subjectively aversive impact correlated with most variables within the typical polytraumatic symptom pattern of these patients.

Keywords: nightmares, PTSD, traffic accidents, neuropsychology, psychiatry.

Published Online: June 16, 2021

ISSN: 2736-5476

DOI: 10.24018/ejclinimed.2021.2.3.38

Z. Z. Cernovsky*

Dept. of Psychiatry, Western University,
London, Ontario, Canada.

(e-mail: zcernovs@uwo.ca)

V. R. Velamoor

Dept. of Psychiatry, Laurentian and
Lakehead Universities, and Western
University, Ontario, Canada.

(e-mail: velamoorraj@gmail.com)

S. C. Mann*

Central Montgomery Behavioral Health,
Norristown, PA, USA.

(e-mail: smann1234@aol.com)

L. C. Litman

Dept. of Psychiatry, Western University,
London, Ontario, Canada.

(e-mail: corvette033@hotmail.com)

*Corresponding Authors

I. INTRODUCTION

Serious car accidents are perhaps the most common trauma experienced by individuals and likely the most common cause of posttraumatic stress disorder (PTSD).[1] If left undiagnosed and untreated it could lead to an escalation of anxiety, depression, suicidal thoughts, and physical health issues. Alcohol abuse has been observed in some patients as a maladaptive attempt to cope with their PTSD.

Commonly reported post-accident psychological symptoms include flashbacks, insomnia, generalized uneasiness, irritability, and anger. This study focuses on posttraumatic nightmares and their associations with other posttraumatic symptoms.

Repetitive anxiety dreams replicating one's traumatic experiences have been reported in various clinical populations, including combat veterans [2], rape victims, traumatized refugees [3], and even university students facing exams [4]. Some of the early medical reports of posttraumatic nightmares involved survivors of traffic accidents, including those occurring on railroads [5]. Posttraumatic nightmares

usually replay frightening aspects of the traumatic event such as the traffic accident or present potential new scenarios of the accidents, for example, with the patient or others in the danger of being seriously injured, maimed, or killed in the impacts.

The present study evaluates the severity and clinical correlates of posttraumatic nightmares in persons injured in high impact motor vehicle accidents (MVAs).

II. METHOD

De-identified data were available on 80 persons injured in MVAs (34 men and 46 women, mean age=38.9 years, SD=12.8; range 15 to 65). The data were from an item validation study [6] of PCL-5, a widely used questionnaire corresponding to the DSM 5 symptom criteria for PTSD. The PCL-5 consists of 20 items each of which is scored via a scale from 0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely.[7] The second item of the PCL-5 inquires to what extent the respondent was "bothered by" ...

“repeated, disturbing dreams of the stressful experience” in the last month.

In this manner, ratings were obtained of the subjectively experienced level of aversiveness of these repeated, disturbing dreams, i.e., of their severity.

In the PCL-5 interpretation system, the symptom described by the item is considered “endorsed” when the score is 2 points or higher, i.e., experienced as moderately, or quite a bit, or extremely bothersome. In our article, the “disturbing dreams” endorsed with the score of 2 or higher are considered as synonymous with nightmares.

In addition to nightmares, patients developed various other post-MVA psychological and medical symptoms, as illustrated by mean ratings of 6.2 (SD=1.7) on the “average pain” item of the Brief Pain Inventory [8], a mean score of 23.1 (SD=4.8) on Morin’s Insomnia Severity Index [9], and elevated scores on the Subjective Neuropsychological Symptoms Scale (SNPSS) (mean =19.9; SD=12.9) [10] and the Rivermead scale (mean =45.5; SD=8.5) [11,12].

Most of the post-MVA patients experienced some degree of driving anxiety. Their mean scores were 63.8 (SD=19.0) on the Whetstone Vehicle Anxiety Questionnaire [13], 91.6 (SD=25.1) on the Driving Anxiety Questionnaire (DAQ)[13], and 14.9 (SD=2.1) on Steiner’s Automobile Anxiety Inventory [14].

Self-ratings of depression, anger, and anxiety were also available on a scale from 0=symptom absent to 10=always present (Items 10 to 12 of the Whiplash Disability Questionnaire [15]).

The time elapsed since the patient’s MVA ranged from 8 to 194 weeks, with the average at 49.7 weeks (SD=36.3), i.e., about a year. All still experienced active post-accident symptoms that required therapy.

In this sample, 61 had no previous MVAs, 15 had one MVA, and 3 patients had 2 or more MVAs. In their recent vehicular accident, 61 were the drivers, 15 were passengers, and 4 were pedestrians.

Data on Item 2 of the PCL-5 were also available from the sample of 21 normal controls (11 men, 10 women, mean age of 43.0 years, SD=20.3).

III. RESULTS

A. Severity of the Nightmares

The responses of post-MVA patients and of normal controls to Item 2 of PCL-5 (“repeated disturbing dreams of the stressful experience”) are listed in Table I.

TABLE I: RESPONSES TO ITEM 2 OF PCL-5

Item 2: In the past month, how much were you bothered by repeated, disturbing dreams of the stressful experience?	Post-MVA patients N=80	Normal Controls N=21
Not at all	26.2%	95.2
A little bit	11.2%	4.8%
Moderately	11.2%	0%
Quite a bit	23.8%	0%
Extremely	27.5%	0%

For our post-MVA patients, the “stressful experience” mentioned in Item 2 was their MVA.

The data indicate that 62.5% of post-MVA patients experienced their posttraumatic nightmares of MVAs as at

least moderately bothersome, i.e., at a level deserving clinical attention.

In contrast, none of the 21 normal controls scored on that level. The Spearman correlation coefficient calculated to compare the subjective impact of the MVA nightmare of MVA patients and the normal controls was 0.53.

Many statisticians, however, would favor using Pearson r in its form as the point biserial coefficient because it has been shown to be adequately robust even to extreme violations of the basic assumptions of normality and of the type of measurement scale.[16] The Pearson r calculated on data in Table I was 0.52, i.e., almost identical to the Spearman coefficient. Both coefficients were significant (p<0.001, 2-tailed) and of moderate magnitude: the post-MVA patients differed significantly from normal controls.

B. Clinical Correlates

The data on clinical measures other than PCL-5 were available only for the post-MVA patients, not for normal controls. The clinical correlations of the subjective impact of MVA nightmares are listed in Table II. We set the criterion of statistical significance to p<0.05, 2-tailed.

TABLE II: CORRELATIONS OF MVA NIGHTMARES TO CLINICAL MEASURES (DATA OF POST-MVA PATIENTS ONLY)

	Pearson Correlations	Significance values (2-tailed)
Whetstone Vehicle Anxiety Questionnaire, [13] N=36	0.69	p<0.001
Driving Anxiety Questionnaire, [13] N=41	0.57	p<0.001
Steiner’s Automobile Anxiety Inventory [14], N=31	0.24	p=0.186
Ratings on Items 3 to 5 of the Brief Pain Inventory [8], N=80:		
Worst pain	0.21	p=0.058
Least pain	0.21	p=0.058
Average pain	0.24	p=0.031
Insomnia Severity Index [9], N=80	0.47	p<0.001
Rivermead Post-Concussion Symptoms Questionnaire [11], [12], N=60	0.42	p=0.001
Subjective Neuropsychological Symptoms scale (SNPSS) [10], N=44	0.41	p=0.006
Ratings on Items 10 to 12 on the Whiplash Disability Questionnaire [15], N=53		
Depression	0.34	p=0.003
Anger	0.32	p=0.004
Generalized Anxiety	0.29	p=0.010

When the Item 2 (“repeated, disturbing dreams”) of PCL-5 is deleted from the total PCL-5 score for PTSD, then this corrected total PTSD score correlates highly at r=0.72 (p<0.001, 2-tailed) with the Item 2, i.e., with the measure of subjectively aversive impact of MVA nightmares. This high correlation shows that repetitive nightmares of the stressful experience are indeed one of the very important aspects of PTSD.

Younger post-MVA patients were somewhat more likely to experience more subjectively aversive MVA nightmares (r=0.27, p=0.016, 2-tailed). The reasons for this are unknown. However, the underlying correlation is rather weak, i.e., of negligible relevance for clinical predictions.

It is noteworthy that the MVA nightmares in our sample of post-MVA patients are not significantly correlated with gender, number of previous MVAs, and with the number of

weeks elapsed since MVAs. All patients in this sample still experienced active post-MVA symptoms.

IV. DISCUSSION

Almost two-thirds (62.5%) of our post-MVA patients reported posttraumatic nightmares of MVAs at a level deserving clinical attention (score of 2 or higher on PCL-5 Item 2).

The level of subjectively aversive impact of these MVA nightmares correlated significantly with Whetstone Vehicle Anxiety questionnaire and also with the Driving Anxiety Questionnaire: the correlations were of moderate size. The correlation of MVA nightmares to Steiner's Automobile Anxiety Inventory was in the expected direction, but was very weak and failed to reach the level of statistical significance. The reason for this may be that Steiner's inventory only compares the pre-MVA level of driving anxiety to the current level, rather than providing a rating of the overall current level of driving anxiety [14].

In general, post-MVA patients with more symptoms in the post-concussion and whiplash spectrum (as measured via Rivermead scale and SNPSS) as well as those with higher levels of average pain and post-accident insomnia reported more bothersome MVA nightmares.

Post-MVA patients with higher levels of post-accident depression, anger, and generalized anxiety also rated their MVA nightmares as having subjectively more aversive impact.

ACKNOWLEDGMENT

The authors thank to Abe Cernovsky, BA, for his editorial assistance in this research project.

REFERENCES

- [1] Ursano RJ, Fullerton CS, Epstein RS, Crowley B, Kao T-C, Vance K, Craig KJ, Dougall AL, Baum A. Acute and chronic posttraumatic stress disorder in motor vehicle accident victims. *American Journal of Psychiatry*. 1999;156(4):589-95. doi: 10.1176/ajp.156.4.589.
- [2] Hartmann E. *The Nightmare: The Psychology and Biology of Terrifying Dreams*. New York: Basic Books, 1984.
- [3] Cernovsky ZZ. Traumatization in refugees. In TW Miller (editor), *Clinical Disorders and Stressful Life Events*. Madison, CT: International Universities Press, 1997, p.71-85.
- [4] Cernovsky ZZ. Reported nightmare frequency in Swiss university students. *Perceptual and Motor Skills*. 1983;57:1169-1170.
- [5] Oppenheim H. *Die traumatischen Neurosen*. Berlin: Hirschwald, 1889.
- [6] Cernovsky ZZ, Fattahi M, Litman LC, and Diamond DM. Validation of the PTSD Checklist for DSM-5 (PCL-5) on Patients Injured in Car Accidents. *European Journal of Medical and Health Sciences*. 2021;3(2):154-159. doi: 10.24018/ejmed.2021.3.2.790.
- [7] Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, & Schnurr PP. *The PTSD Checklist for DSM-5 (PCL-5)*. The National Center for PTSD, US Department of Veterans Affairs, Washington, DC, 2013. www.ptsd.va.gov.
- [8] Cleeland CS. *The Brief Pain Inventory - User Guide*. Houston, TX: The University of Texas - M. D. Anderson Cancer Center, 2009.
- [9] Morin CM, Belleville G, Bélanger L, and Ivers H. The insomnia severity index: psychometric indicators to detect insomnia cases and evaluate treatment response. *Sleep*. 2011; 34:601-608.
- [10] Cernovsky ZZ, Litman LC, Mann SC, Oyewumi LK, Bureau Y, Mendonça JD, Diamond DM, and Raheb H. Validation of the Subjective Neuropsychological Symptoms Scale (SNPSS) in Injured Motorists. *Archives of Psychiatry and Behavioral Sciences*. 2021;4(1):6-13.
- [11] King NS, Crawford S, Wenden FJ, Moss NEG, Wade DT. The Rivermead Post Concussion Symptoms Questionnaire: a measure of

symptoms commonly experienced after head injury and its reliability. *Journal of Neurology*. 1995;242:587-592.

- [12] Cernovsky ZZ, Mann SC, Velamoor V, Oyewumi LK, Diamond DM, Litman LC. Validation of the Rivermead Post-Concussion Symptoms Questionnaire (RPQ) on Patients Injured in High Impact Car Accidents. *Archives of Psychiatry and Behavioral Sciences*. 2021;4(1):14-22. doi.org/10.22259/2638-5201.0401003.
- [13] Whetstone JP, Cernovsky Z, Tenenbaum S, Poggi G, Sidhu A, Istasy M, Dreer M. Validation of James Whetstone's Measure of Amaxophobia. *Archives of Psychiatry and Behavioral Sciences*. 2020;3(1):23-33.
- [14] Cernovsky ZZ, Fattahi M, Litman LC, Tenenbaum S, Leung B, Nosonova V, Zhao C, and Dreer M. Validity of Steiner's Automobile Anxiety Inventory. *European Journal of Medical and Health Sciences*. 2021;3(1):56-61 doi: 10.24018/ejmed.2021.3.1.661.
- [15] Pinfold M, Niere KR, O'Leary EF, Hoving JL, Green S and Buchbinder R. Validity and internal consistency of a Whiplash-Specific disability measure. *Spine*. 2004;29(3):263-268.
- [16] Havlicek LL, & Peterson NL. Effect of the violation of assumptions upon significance levels of the Pearson r. *Psychological Bulletin*, 1977;84(2):373-77. https://doi.org/10.1037/0033-2909.84.2.373.

Zack Z. Cernovsky was born in 1947 and holds the Ph.D. in clinical psychology from the University of Zürich, Switzerland, 1986. He is the professor of psychiatry in the medical school of Western University, Canada. Professor Cernovsky has published close to 200 scientific articles in the field of psychiatry and medical psychology, and also chapters in university textbooks.

Varadaraj R. Velamoor graduated in Medicine from Osmania University in India and received his training in Psychiatry in the United Kingdom. He is currently Professor of Psychiatry at the Northern Ontario School of Medicine as well as Professor Emeritus at the Western University School of Medicine. He was previously on Faculty at Cornell University. Professor Velamoor has published over a hundred scientific articles as well as book chapters and psychiatric monographs in the areas of suicidal behaviour, violence, stress at the work place, collaborative care, geriatric psychopharmacology and the Neuroleptic Malignant Syndrome (NMS). His work in NMS is internationally recognized and frequently cited. He has received Fellowships from the Royal College of Psychiatrists, UK, as well as the American Psychiatric Association.

Stephan C. Mann was born on May 6, 1948 in Philadelphia, Pennsylvania, USA. He received his medical degree from the Sidney Kimmel Medical College of Thomas Jefferson University where he also completed his residency in psychiatry. He worked for the United States Veterans Health Administration for over thirty years and retired as Chief of Mental Health & Behavioral Sciences at the Louisville VA Medical Center, Louisville, KY. He is currently in private practice. Dr. Mann has previously held faculty positions as Professor of Psychiatry at both the University of Pennsylvania School of Medicine and the University of Louisville School of Medicine. He is a Distinguished Life Fellow of the American Psychiatric Association and is certified by the American Board of Psychiatry and Neurology. He has published almost one hundred scientific publications including three books. Dr. Mann's main research focus includes neuroleptic malignant syndrome, malignant catatonia, tardive dyskinesia, and the neurobiology of schizophrenia.

Larry Craig Litman obtained his Ph.D. in clinical psychology from York University, Ontario, Canada. He has taught classes in statistics at that university. Dr. Litman is currently on faculty staff of the Department of Psychiatry, Schulich school of Medicine & Dentistry, Western University, London, Ontario, Canada. He has published numerous empirical studies in clinical psychology and psychiatry.