ORIGINAL ARTICLE

Incidence and demographical characteristics of patients with post-traumatic stress disorder due to motor vehicle accidents

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Abstract

Introduction: Motor vehicle accidents (MVAs) are daily occurrences in Malaysia but the extent to which victims are psychologically affected is not well known. The objective of this study is to determine the incidence and demographic characteristics of patients with post-traumatic stress disorder (PTSD) due to MVAs at a university hospital in Malaysia.

Methods: Patients presenting to the emergency department from August to October 2014 due to MVA-related injuries were recruited. After a period of at least one month, they were followed-up and screened using the validated Malay Post Traumatic Stress Disorder Checklist Civilian version. A score of 30 was chosen as the cut-off point for PTSD.

Results: In total, 112 patients presented to the emergency department following MVAs during the study period. Of these, 60.7% agreed for the follow-up. Among the respondents, the mean age was 26 years, 91.2% were males, 66.2% were married, 85.3% were Malays and 88.3% were Muslims. The calculated incidence of PTSD was 7.4%. There was no significant difference noted between the PTSD and non-PTSD groups.

Conclusion: A considerable number of MVA victims in Malaysia may develop PTSD after the accident. Further research is needed to explore the factors that contribute or protect to develop the condition.

Introduction

Near death experiences, serious injuries or sexual assaults are events which are considered traumatic, especially when they are unexpected and catastrophic. Following such exposure, psychological sequelae are common but for most sufferers, symptoms will spontaneously disappear as time passes. In some cases, the condition called post-traumatic stress disorder (PTSD) could occur as a result. This condition is diagnosed when intrusion memories, avoidant actions, deterioration in mood and cognition as well as hyperarousal symptoms persist beyond one month.[1,2]

The lifetime prevalence of PTSD varies greatly from 0.3% to 6.8% depending on the population studied.[3,4] In the months following exposure to traumatic events, the prevalence of PTSD increased greatly, 15% to 75% following man-made disasters (e.g., toxic spills and collapse of buildings) but lower (3.7%–60%) after natural disasters.[5] Numerous research on the condition has been conducted throughout the years, but mainly in the military population and in combat situations.[6] Events such as natural and man-made disasters, assaults and motor vehicle accidents (MVAs) are no less traumatic and may even be more significant because they affect more people in larger geographical areas. Fortunately, these events are no longer being neglected and more research is being done to study their consequences.[7]

Every year, more than one million people die due to MVAs globally and it is the eighth leading cause of death worldwide.[8] Studies in the US estimated that around 24% to 33% of MVA victims suffer from PTSD after one month of the accident.[7] In 2012, there were 462,000 MVAs in Malaysia and about 7000 road deaths were reported. This number is projected to increase every year and in 2015, the estimated number was 9000 road deaths.[9] The numbers are astounding, but the real question is – will they bring about significant psychiatric morbidity? Currently, no data exist on the rate of PTSD for Malaysian MVA victims.

The aim of this study is to determine the incidence of PTSD one month after the presentation of MVAs at an emergency department in a university hospital in Malaysia and the demographical characteristics of those patients.

Methods

This prospective study was conducted in an emergency department of a large university hospital in Klang Valley. Ethical approval was obtained prior to commencement from the university hospital's own Ethics Committee. During the months of August to October 2014, all patients who presented with MVA-related injury were recruited into the study. Subjects recruited were followed-up one month later and were asked to complete a self-rated screening questionnaire for PTSD. The data were analysed using IBM SPSS Statistics computer software version 22.

Study sample

The study only included adults aged 18 and above who attended the hospital's emergency department for injuries due to MVAs during August to October 2014. Other inclusion criteria were subjects had to be co-operative, literate and able to understand Malay or English language. Those with major language issues or cognitive problems such as dementia were excluded from the study.

Study instrument

The study utilised the Post Traumatic Stress Disorder Checklist for Civilians (PCL-C).[10] It has the advantage of being self-rated, hence not increasing the load on an already stretched emergency department staff. Its brevity (17 items) also suited patients. It has strong validity with the gold standard diagnostic procedure – the Clinician Administered PTSD Scale (CAPS).[11] A translated version of the PCL-C, the Malay PCL-C (MPCL-C), has been validated for use in the Malaysian population.[12] The cut-off point for PTSD was taken as the total MPCL-C score of 30 and above as recommended by the original authors.[13]

Results

During the study period, 112 patients fulfiled the study criteria and were included. After one month following their recruitment into the study, subjects were followed-up and asked to complete the MPCL-C via a telephone interview. During the follow-up contact, 68 patients responded and agreed to complete the questionnaire (60.7%). The mean age of those who responded was 26 years, the majority were male (91.2%) and single (33.8%). The rest of the demographic data of the subjects included in the study can be seen in **Table 1**.

Table 1. Sociodemographic characteristics at one month after motor vehicle accident

	No.	%
Age (years)	Mean (SD), 66.09 (5.90)	
Gender		
Male	62	91.2
Female	6	8.8
Marital status		
Single	45	66.2
Married	23	33.8
Race		
Malay	58	85.3
Chinese	2	2.9
Indian	5	7.4
Other	3	4.4
Religion		
Muslim	60	88.3
Christian	3	4.4
Buddhist	2	2.9
Hindu	3	4.4

	No.	%
Occupation		
Unemployed	3	4.4
Student	21	30.9
Sales and services	17	25
Technical	9	13.2
Administrative	6	8.8
Professionals	4	5.9
Police/Army	4	5.9
Factory operator	4	5.9
Monthly income (RM)		
Less than 1000	5	7.9
1000–2999	23	36.5
3000–4999	7	11.1
5000–9999	4	6.4
More than 10,000	1	1.6
Undisclosed	23	36.5
Vehicle		
Pedestrian	1	1.5
Motorcycle	65	95.6
Car	2	2.9

In this population, the incidence of PTSD of following MVA was found to be 7.4%. Although about one third (33.3%) of the female participants was ascertained to suffer from PTSD symptoms after one month of MVA, the difference by gender was not significant. There was no significant difference between the PTSD and non-PTSD groups in terms of age, marital status and seriousness of the event (**Table 2**).

Table 2. Comparison between groups

	PTSD (%)	Significance
Age (Mean)		
No PTSD	26.2	$p = 0.46$*
PTSD	23.4	
Gender		
Male	4.8	$p = 0.58$**
Female	33.3	
Seriousness of Accident		
Minor	9.1	$p = 0.93$***
Moderate	7.1	
Major	6.7	
Marital status		
Single	8.9	$p = 0.45$**
Married	4.3	

*t-test for equality of means; **Fisher's exact test; ***One-way ANOVA.

Discussion

The diagnosis of PTSD in this study is ascertained using the PCL-C, which is based on the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV).[14] The current diagnostic manual in use is the fifth edition of the DSM (DSM-5), gradually replacing the older version of the manual since 2013.[15] However, during the study period, there was no validated tool for PTSD compatible with DSM-5 available. Work on determining the psychometric properties of the updated version of the PCL, the PCL-5, is still underway.[16,17] The major changes between PCL and PCL-5 were three new symptoms were added (blame, negative emotions and self-destructive behaviour) and the corresponding increase in the number of items from 17 to 20, rewording and the change to four-point scales.[17] Hence, while some new symptoms were added, the core symptoms remained the same and thus PCL's use would still acceptable until the PCL-5 has been fully validated.[18] The other important issue to note is that there were three versions of the PCL available, the PCL for military personnel (PCL-M), for civilians (PCL-C) and for specific stressful events (PCL-S). However, there is only one version of the PCL-5 available, and it corresponds to PCL-S.[19]

Since this study was conducted, a few papers on PTSD following MVA on Malaysian roads were published. A study by Ghazali et al. looked at lifetime exposure to stressful events and PTSD symptoms among adolescents in Sarawak.[20] They found that MVAs were the most common stressful events encountered (20.1%). In total, 7.1% of these adolescents, regardless of the types of trauma experienced, were positive for PTSD symptoms but but there was no specific analysis for MVA exposure. Hence, the prevalence of PTSD in these adolescents due to MVA was not reported. Jaapar et al. conducted a study to evaluate the prevalence of PTSD among trauma patients in the orthopaedic setting in Kelantan.[21] In this population, the main cause of trauma was MVA, but patients who presented with other sources of trauma were also included. Their study found the prevalence of PTSD in this group to be 24.9%. Nevertheless, even with the publication of these two papers, the incidence and prevalence of PTSD in MVA victims specifically were still not determined prior to this study.

The rate of PTSD calculated in this study is by far lower than those quoted above from studies in the USA. In a meta-analysis by Ozer et. al., perceived life threat had a small to medium significance in predicting the development of PTSD. Hence, including cases of non-severe accidents that have lower perceived life threat in this study may have lowered the incidence.[22] Studies in Japan yielded similar rates, i.e., between 7.5% and 8.5%[23,24] and the authors suggested that culture may have influenced the rates. This is a plausible explanation. Certainly, in the Eastern culture, psychological symptoms are not taken as seriously as physical symptoms and hence may not be regarded as indications of illness at all. This, in turn, will influence health seeking behaviour resulting in underdiagnosis of the condition. A third explanation may be due to compensation seeking practices. In the Western world, PTSD is one of the commonest mental illness to be brought to courts for compensation purposes.[25] For those patients, the diagnosis of PTSD is highly beneficial and allows them to receive claims for damages. However, in Malaysia, the compensation seeking culture is still unfamiliar like many other countries in the Asian region. It is possible that the overestimation of PTSD rates for MVA victims in the USA is due to legislative action being pursued.

The sociodemographic characteristics of patients involved in this study show a high predominance of young, single, male motorcyclists. Although, they do not represent the general population of Malaysia, they do, however, represent the population frequently involved in MVAs in the Klang Valley area.[26] The Klang Valley is a highly urbanised populous area where most households would own at least one car and maybe an additional one or two motorcycles. The other parts of Malaysia vary in differences and similarities to the Klang Valley and the data may not be generalisable to the entire country.

The other point of interest is that there were no significant differences between the PTSD and non-PTSD groups in terms of age, gender, marital status and seriousness of the accident. On the contrary, many studies have found that women were more likely to develop PTSD following MVAs than men.[27] In this study, women made up only about 9% of the sample but yet 33.3% of them

were positive for PTSD. Since the difference is not statistically significant in this study, it is possible that the number of female participants in the study was too small to make a meaningful comparison.

Finally, the other limitations of the study include the high drop-out rate and the inability to make a proper comparison between groups due to the low incidence of PTSD. This can be improved by having a larger sample either through conducting the study for a longer period of time or oversampling participants at the time of recruitment or both. The inclusion of participants with non-serious MVAs was another limitation, which may dilute the incidence obtained. As the study was conducted in one hospital in the Klang Valley, generalisability may be problematic and a larger study involving different centres across the country may be required.

Conclusion

A significant number of MVA victims in Malaysia develop PTSD. If this condition is not managed properly, the number will increase and it may become a more prevalent illness. As part of the skilful management of any mental illness, the treatment has to start with detection and diagnosis, which highlights the importance of our study. Nevertheless, further research is needed to uncover the factors influencing the development of PTSD in order to understand the condition better and hence manage it effectively.

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