PSYCHOLOGICAL MEDICINE

Post Traumatic Stress Disorder and Its Associated Risk Factors among Trauma Patients Attending the Orthopaedic Wards and Clinics in Kota Bharu, Kelantan

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ABSTRACT

Background: **Posttraumatic stress disorder (PTSD) is prevalent among trauma patients seeking treatment.**

Objectives: **This study aimed to evaluate the prevalence and associated risk factors of PTSD using the newly validated Malay Trauma Screening Questionnaire (TSQ-M).**

Methods: **A total of 201 trauma patients attending the orthopaedic wards and clinics, Hospital Universiti Sains Malaysia (HUSM) and Hospital Raja Perempuan Zainab II (HRPZII) were recruited and the TSQ-M was administered to all participants.**

Results: **A total of 50 (24.9%) of the trauma patients had PTSD based on TSQ-M using a cut-off score of 5. None of the risk factors were significantly associated with PTSD in this study. Female gender and lower education were, 2.00 and 1.82 times respectively, more likely to experience PTSD.**

Conclusion: **PTSD is common affecting about a quarter of trauma patients attending the orthopaedic services. We need to maintain a high index of suspicion in trauma patients regardless of their socio-demographic and clinical characteristics.**

KEY WORDS

orthopaedic, trauma, risk factor, TSQ, PTSD

INTRODUCTION

Trauma has more than physical effects on the patients. In fact, suffering a traumatic injury can have serious and long-lasting implications on patient's mental health with post-traumatic stress disorder (PTSD) and depression affecting 20.7% and 6.6% of injured patients one year after the injury. Both disorders were independently associated with significant impairments across all functional outcomes. Patients who had one disorder were three times less likely to be working one year after injury, and patients with both disorders were five to six times less likely to have returned to work[1]. PTSD can also accompany chronic painful diseases and as such, PTSD has been observed in more than 50% of fibromyalgia patients with chronic pain[2].

Motor vehicle accidents (MVA) were found to be a leading cause of PTSD preceded only by sexual and physical assaults. MVA alone could account for 28 cases of PTSD for every 1000 adults in the United States[3]. PTSD occurred in about one tenth of MVA survivors. It was associated with having pre-accident psychological or social problems and, in patients with multiple injuries and continuing medical complications[4]. PTSD prevalence rate was higher at 13.3% among motor vehicle accident (MVA) survivors attending the orthopaedic and trauma clinic at Kenyatta National Hospital, Nairobi. The risk factor for PTSD include female, age 20-29, being married, post-primary education, experiencing the first motor vehicle accident, and having previous psychiatric illness or other medical illness[5]. In another study conducted in Nigeria, the prevalence of PTSD was 26.7% among MVA survivors compared to 8.0% and 8.7% in the control groups. Female gender and being gainfully employed prior to the accident was significantly associated with PTSD[6].

There were few published studies on PTSD in Malaysia. Among the survivors of December 26th, 2004 Malaysian Tsunami, only 19% of respondents fulfilled the criteria for PTSD. None of the socio-demographic characteristics of the respondent was significantly associated with PTSD. However, there is a significant association with maladaptive coping styles[7]. In a study among help-seeking women experiencing domestic violence in two shelters in Malaysia, 60% had symptoms consistent with the diagnosis of PTSD. Negative appraisals about themselves and self blame for the abusive situations were positively associated with increased tendency to develop PTSD[8].

The purpose of this study was to evaluate PTSD and its associated risk factors among trauma patients attending the orthopaedic wards and clinics, Hospital Universiti Sains Malaysia (HUSM) and Hospital Raja Perempuan Zainab II (HRPZII). We hypothesize that female gender, being married, employed prior to the trauma, and presence of other medical illness would be the risk factors for PTSD.

METHODOLOGY

Subject

The study protocol was approved by the Research and Ethics Committee, Universiti Sains Malaysia and Ministry of Health. Eligible subjects gave their written informed consent after the nature of the cross-sectional study was explained. Subjects age 18-65 with history of trauma at least 1 month prior to the study were recruited from the orthopaedic wards and clinics, HUSM and HRPZII which are located in Kota Bharu, northeastern part of peninsular Malaysia. They were cooperative, literate and able to understand the Malay language. Those with traumat-

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Table1. Characteristics of Subjects (N = 201)

	All subjects n (%)	PTSD n (%)	P value	OR (95% CI)
Age			0.257	1.54 (0.76, 3.04)
≤ 40	160 (79.6)	37 (23.1)		
> 40	41 (20.4)	13 (31.7)		
Gender			0.097	1.82 (0.89, 3.72)
Male	154 (76.6)	34 (22.1)		
Female	47 (23.4)	16 (34)		
Marital status			0.302	1.40 (0.74, 2.68)
Single/widow/divorced	121(60.2)	27 (22.3)		
Married	80 (39.8)	23 (28.7)		
Ethnic			0.409	2.38 (0.29, 19.85)
Malay	193 (96.0)	49 (25.4)		
Non-Malay	8 (4.0)	1 (12.5)		
Education			0.087	2.00 (0.90, 4.44)
Lower (Secondary and below)	146 (72.7)	41 (28.1)		
Higher (Tertiary and above)	55 (27.3)	9 (16.4)		
Occupational status prior to trauma			0.315	1.43 (0.71, 2.89)
Working	133 (66.2)	36 (27.1)		
Not working	68 (33.8)	14 (20.6)		
Income (RM)			0.652	1.16 (0.61, 2.23)
≤ RM 1,000	122 (60.7)	29 (23.8)		
> RM 1,000	79 (39.3)	21 (26.6)		
Living status			0.398	1.73 (0.48, 6.24)
Family	183 (91.0)	47 (25.7)		
Friends/ Alone	18 (9.0)	3 (16.7)		
Time of accident (months ago)			0.955	1.02 (0.52, 2.00)
1-3	132 (65.7)	33 (25)		
≥ 3	69 (34.3)	17 (24.6)		
Types of accident			0.396	1.35 (0.67, 2.71)
Motor vehicle accident (MVA)	146 (72.6)	34 (23.3)		
Non-MVA	55 (27.4)	16 (29.1)		
Death in the accident			0.623	0.58 (0.07,5.12)
Yes	6 (3)	1 (16.7)		
No	195 (97)	49 (25.1)		
History of medical illness			0.682	1.12 (0.54, 2.34)
Present	49 (24.4)	13 (26.5)		
Absent	152 (75.6)	37 (24.3)		

ic brain injury or severe mental illness such as schizophrenia and major depression were excluded.

Assessment

The Trauma Screening Questionnaire (TSQ) is a 10-item self-rated questionnaire for use with survivors of all types of traumatic stress. It consists of 5 re-experiencing and 5 arousal items. Respondents are asked to endorse those items that they have experienced at least twice in the past week. It is recommended that screening be conducted 3 to 4 weeks post-trauma to allow for normal recovery processes to take place. Excellent prediction of a PTSD diagnosis was provided by respondents endorsing at least 6 items[9]. The TSQ-M was validated for local population. It showed good psychometric property with internal consistency Cronbach alpha of 0.73 and concurrent validity with the Clinician-Administered PTSD Scale 0.57. At the optimal cut-off score of 5, the sensitivity, specificity, positive and negative predictive values are 0.80, 0.85, 0.48 and 0.96 respectively[10]. A single trained researcher (the first author), conducted the interview and administered the Malay Trauma Screening Questionnaire (TSQ-M) individually to all subjects from May to July 2010. Subjects were considered to have PTSD if their TSQ-M scores were 5 and above.

Statistical analysis

All data entry and analysis were done using Statistical Packages for Social Science (SPSS) version 18.0 software. Descriptive statistics were performed for socio-demographic, traumatic events and clinical characteristic.

RESULTS

A total of 201 patients met the inclusion and exclusion criteria participated in the study. The subjects were mostly single or widow (n = 121, 60.2%), Malay (n = 193, 96%), male (n = 154, 76.6%) age between 21-30 years (n = 86, 42.8%). Most of them were unskilled worker (n = 96, 47.8%) with monthly income of less than RM 1,000 (n = 122, 60.7%), educated up to secondary level (n = 132, 65.7%) and living with family (n = 183, 91%). The main cause of trauma among the subjects was motor vehicle accident (n = 146, 72.6%) involving motorcycle (n = 127) and mostly did not involved death in the incident (n = 195, 97%)

A total of 50 subjects had PTSD based on TSQ-M using a cut-off score of 5. Therefore, the prevalence of PTSD was 24.9%. In order to assess the risk factors for developing PTSD in trauma patients attending orthopedic wards and clinics in HUSM and HRPZ II, odds ratio was calculated. Trauma patients who were female and educated up to secondary level were, 2.00 and 1.82 times respectively, more likely to experience PTSD. Other risk factors include age above 40 (OR 1.54), female gender (OR 1.82), married (OR 1.40), ethnic Malay (OR 2.38), educated up to secondary level (OR 2.00), working (OR 1.43), income more than RM 1,000 (OR 1.16), non-MVA trauma (OR 1.35) and having a medical illness (OR 1.12). Nevertheless, none of the risk factors above reached statistical significance in this study.

DISCUSSION

The prevalence of PTSD in trauma patients who attended the orthopaedic wards and clinics in HUSM and HRPZII was 24.9%. It was higher compared to a study in Kenyatta Hospital which was 13.3%[5] but lower compared to a study by Starr *et al* at 51%[11]. The prevalence of PTSD in other settings involving MVA survivors and orthopaedic trauma patients, ranged from 11% to 51%[4,5,11,12]. Different prevalence across studies were believed to be influenced by a lot of factors, including differences in diagnostic criteria, the measurement approach used to ascertain exposure and assess PTSD, and the demographic characteristics and representativeness of the study populations.

In a cross-sectional survey of flood affected people of Banda Sheikh Ismail, no significant correlation was found between age, gender and education level with PTSD. Instead, the duration spent in the floods and how the affected person perceives the severity of flood was positively correlated with PTSD development[13]. In a survey to estimate the prevalence of PTSD and its determinants among adult earthquake survivors after the 2008 Wenchuan earthquake in China, the prevalence rates of suspected PTSD were 47.3% (n = 436) in heavily damaged areas and 10.4% (n = 93) in moderately damaged areas. Older age, female gender, unmarried/divorced/widowed, ethnic minority, death of family member, no household income and damaged household were independent risk factors for PTSD symptoms in heavily damaged areas[14]. The severity of traumatic events (TE) influenced the likelihood of PTSD and the different rates of PTSD measured in different studies.

In light of the recent advances in genetic studies, PTSD is being conceptualized as an interaction between a subject, a traumatogenic factor and a social context. A genetic polymorphism affecting the regulation of gene expression in the serotoninergic system and the hypothalamic-pituitary-adrenal (HPA) axis is believed to be essential in the development of a PTSD. Particularly, the interaction between genetic polymorphism at the 5HTTLPR (serotonin-transporter-linked polymorphic region) and stressful life events could predict depression and PTSD[15]. More recently, it was found that BDNF serum levels were lower in PTSD patients as compared to related control subjects suggest-

ing a possible role of BDNF in the pathophysiology of PTSD[16].

Most studies have shown that unrelated to the traumatic event, additional risk factors for developing PTSD include younger age at the time of the trauma, female gender, lower social economic status, lack of social support, premorbid personality characteristics and preexisting anxiety or depressive disorders increase the risk of PTSD[15]. Trauma patients who were female and educated up to secondary level were, 2.00 and 1.82 times respectively, more likely to have PTSD. Being female was related to high risk of PTSD after experiencing a TE[17]. However, none of these factors reached statistical significant which is consistent with a study by Wallace et al which found no factors significantly associated with or predictive of PTSD[18]. Interestingly, ethnic Malay was 2.38 more likely to have PTSD compared to non-Malay. This is in contrast to finding that showed ethnic minority such as Hispanic participants were nearly seven times more likely to be positive for PTSD symptomatology[19].

CONCLUSION

PTSD commonly affects trauma patients, albeit no factors were significantly associated with PTSD in this study. Screening for PTSD is important as trauma has more than physical effects on orthopaedic patients.

REFERENCES

1) Zatzick D, Jurkovich GJ, Rivara FP, Wang J, Fan M-Y, Joesch JM, Mackenzie E. A national US study of posttraumatic stress disorder, depression, and work and functional outcomes after hospitalization for traumatic injury. *Annals of Surgery* 2008; 248(3): 429-437.
2) Singh AN. Pain behaviours and psychiatric complications in pain syndrome. *International Medical Journal* 2012; 19(3): 205-207.
3) Norris FH. Epidemiology of trauma: Frequency and impact of potentially traumatic events on different demographic events. *J Consult Clin Psychol* 1992; 60(3): 409-18.
4) Mayou R, Bryant B, Duthie R. Psychiatric consequences of road traffic accidents. *BMJ* 1993; 307(6905): 647-51.
5) Ongecha-Owuor FA, Kathuku DM, Othieno CJ, Ndetei DM. Post traumatic stress disorder among motor vehicle accident survivors attending the orthopaedic and trauma clinic at Kenyatta National Hospital, Nairobi. *East Afr Med J* 2004; 81(7): 362-6.
6) Iteke O, Bakare MO, Agomoh AO, Uwakwe R, Onwukwe JU. Road traffic accidents and posttraumatic stress disorder in an orthopedic setting in South-Eastern Nigeria: a controlled study. *Scand J Trauma Resusc Emerg Med* 2011; 19: 39.
7) Subramaniam P, Chin HY, Ghazali SE, Sinniah A, Mahadevan R. Posttraumatic stress disorder (PTSD) symptoms, coping styles and social support among survivors of the December 26th 2004 Malaysian tsunami disaster. *ASEAN Journal of Psychiatry* 2009; 10(1): 32-42.
8) Din NC, Bee SS, Subramaniam P, Oon NL. The prevalence and factors influencing posttraumatic stress disorders (PTSD) among help-seeking women experiencing domestic violence in Malaysia. *ASEAN Journal of Psychiatry* 2010; 11(2): 158-70.
9) Brewin CR, Rose S, Andrews B, Green J, Tata P, McEvedy C, Turner S, Foa EB. Brief screening instrument for post-traumatic stress disorder. *Br J Psychiatry* 2002; 181: 158-62.
10) Jaapar SZS, Abidin ZZ, Othman Z. Validation of Malay trauma screening questionnaire. *International Medical Journal* (In press).
11) Starr AJ, Smith WR, Frawley WH, Borer DS, Morgan SJ, Reinert CM, Mendoza-Welch M. Symptoms of posttraumatic stress disorder after orthopaedic trauma. *J Bone Joint Surg Am* 2004; 86-A(6): 1115-21.
12) Blanchard EB, Hickling EJ, Taylor AE, Loos W. Psychiatric morbidity associated with motor vehicle accidents. *J Nerv Ment Dis* 1995; 183(8): 495-504.
13) Sana R, Khattak SUR. Prevalence of post traumatic stress disorder in flood affected poppulation of Banda Sheikh Ismail, district Nowshera. Journal of Postgraduate Medical Institute 2014; 28(1): 27-32.
14) Kun P, Tong X, Liu Y, Pei X, Luo H. What are the determinants of post-traumatic stress disorder: age, gender, ethnicity or other? Evidence from 2008 Wenchuan earthquake. Public Health 2013; 127(7): 644-52.
15) Auxemery Y. Posttraumatic stress disorder (PTSD) as a consequence of the interaction between an individual genetic susceptibility, a traumatogenic event and a social context. *Encephale* 2012; 38(5): 373-80.
16) Angelucci F, Ricci V, Gelfo F, Martinotti G, Brunetti M, Sepede G, Signorelli M, Aguglia E, Pettorruso M, Vellante F, Di Giannantonio M, Caltagirone C. BDNF serum levels in subjects developing or not post-traumatic stress disorder after trauma exposure. Brain Cogn 2014; 84(1): 118-22.
17) Olaya B, Alonso J, Atwoli L, Kessler RC, Vilagut G, Haro JM. Association between traumatic events and post-traumatic stress disorder: results from the ESEMeD-Spain study. *Epidemiol Psychiatr Sci* 2014; 25: 1-12.
18) Wallace M, Puryear A, Cannada LK. An evaluation of posttraumatic stress disorder and parent stress in children with orthopaedic injuries. *J Orthop Trauma* 2013; 27(2): e38-41.
19) Williams AE, Smith WR, Starr AJ, Webster DC, Martinez RJ, Vojir CP, Sakalys JA, Morgan SJ. Ethnic differences in posttraumatic stress disorder after musculoskeletal trauma. *J Trauma* 2008; 65(5): 1054-65.