Post-traumatic stress disorder in international surgeons undertaking trauma electives in a South African trauma centre

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Introduction

Post-traumatic stress disorder (PTSD) is a psychiatric condition in which the individual who has experienced a traumatic event develops several psychological symptoms, which persist for a month or longer following the initiating event. These symptoms include involuntary intrusion symptoms, avoidance behaviours, negative cognitions and mood, and hyperarousal symptoms. The triggering event can include directly experiencing or witnessing the traumatic event, learning it occurred to a close friend or family, or experiencing repeated exposure to aversive details of the event. The latter exposure may be work related. The symptoms of PTSD results in the patient experiencing functional impairment in both social and occupational life.1–3

Studies based on a national survey of general surgeons in the United States (US) recorded a PTSD rate of up to 17%, increasing to 40% among trauma specialists.4,5 Rates are significantly lower in gynaecologists (1.5%) and orthopaedic surgeons (0.3%).3,4 This suggests there is an association between PTSD and trauma work exposure. This is in keeping with the higher rates of PTSD observed in paramedics (4–21.5%) and firefighters (6–37%).4,6 These healthcare and emergency staff are frequently exposed to situations in which they will either be exposed to physical risk or repeatedly witness the effects of physical trauma. This is a risk factor for the development of PTSD.6–7,9

South Africa experiences a high burden of physical trauma and both the homicide and road traffic accident rates are much higher than those reported globally.10,11 In the general population, the South African Stress and Health Study identified a lifetime prevalence of PTSD of 2.3%, increasing to 3.5% following exposure to trauma.12 Among 1099 South African prehospital emergency service personal, rates of PTSD were 28%, 30%, 25% among surveyed ambulance, fire and traffic personnel, respectively. Approximately 30% of these staff had experienced an assault whilst on duty and 88.4% had experienced a critical event in the prior two months to the survey.13 A survey of 1859 South African anaesthetists following the death of a patient on the table identified a 28.8% probable diagnosis of PTSD.14 There is little data on the prevalence of PTSD amongst South African surgeons.

South Africa is a popular destination for international surgeons to obtain trauma experience not otherwise available in their home country. Uchino et al. demonstrated that a one-year trauma elective at their institution allowed international surgeons to gain experience that would otherwise require a much longer period of time to acquire in their countries.
of domicile. Gaining such clinical experience may be associated with an increased risk to mental health secondary to witnessing trauma-related physical injury in conjunction with new training and organisational demands in a foreign social environment during these elective placements.

There has been no literature on the extent of PTSD among surgeons in South Africa, let alone the specific subgroup of international visiting surgeons who are training and providing essential clinical service to South African public hospitals. Our study aims to add to this literature base by identifying the prevalence of PTSD among visiting international surgeons who completed their trauma electives at a major trauma centre in South Africa.

Methods

This was a cross-sectional study utilising an online survey for all international surgeons who had completed their fixed term trauma electives during the period of 2010–2014 at the Pietermaritzburg Metropolitan Trauma Service (PMTS) in South Africa. PMTS is one of the largest academic trauma centres in the western part of the province and covers a population of over three million people. The trauma elective placement includes a mixture of ward, clinic, emergency department, acute and elective surgical experience.

We defined international surgeon as any international medical graduates (IMG) who completed their surgical training outside of South Africa. An online survey was sent to the international surgeon cohort at the end of the completion of their training at our institution. The trauma screening questionnaire (TSQ) is a 10-item self-reported screening instrument to detect a probable diagnosis of PTSD according to the DSM-IV, with a sensitivity of 0.94 and specificity of 0.56 when using a cut-off of equal to six or higher. It is based on the 24-item PTSD Symptom Scale – Self Report (PSS-SR). Permission to use TSQ was obtained from its author. The primary focus of the end of placement survey is on clinical experience so the TSQ was chosen for its brevity. The survey was provided in English only which all international surgeons spoke as a requirement for the elective placement. Details of local mental health services was provided for participants in the event that they screened positive. Participants could withdraw consent by not completing the survey.

Ethical approval for this study was formally endorsed by the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal, Durban, South Africa (ref. no. BE427/17). Data was stored on password protected databases.

Statistical analysis

Data was captured electronically, exported to an excel spreadsheet and descriptive statistics performed using Microsoft excel, Version 16. Parametricity was assessed via the Shapiro-Wilk test. Continuous variables with normal and non-normal distributions were compared using independent samples t-test and Kruskal Wallis test, respectively, then non-normal distributions were compared using independent samples t-test and Kruskal Wallis test, respectively. Categorical variables were compared using chi-squared test. Statistical significance is achieved when $p < 0.05$.

Results

Overview

Sixty TSQ questionnaires were sent out between 2010 and 2014, of which 19 were completed and returned (32%). Two participants selectively did not answer the TSQ while answering other questions on their training and therefore were excluded from the study.

Demographics

There were 13 male and six female respondents. The mean age was 39 years (SD 6.5). The country of origin of each surgeon includes five from Japan, four from Sweden, three from Africa, three from the United Kingdom, one from Belgium, one from India, one from the Netherlands and one from New Zealand. Median postgraduate working experience was 5 (2–10) years. Of the respondents, 3 had undertaken a formal trauma rotation prior to their elective in South Africa at a level one trauma centre, as defined by the American College of Surgeons (ACS), for a median 4.5 (range 3–6) months; 12 respondents had ICU experience for a median 2 (range 1–12) months.

Median time of stay in South Africa was 6 (1–72) months. The median number of major resuscitations managed before their SA rotation was 20 (range 0–1000), and the median number managed during their placement in South Africa was 100 (4–500).

PTSD

Five (26%) respondents reported situations where there were concerns that their personal safety was at risk, of which two screened positive for probable PTSD. One respondent was robbed at gunpoint (TSQ score 1) and another reported intrusive thoughts related to a young patient’s death (TSQ 3). No comments specified traumatic events related to the hospital environment.

Median TSQ score was 0.5 (0–10). Two (10.5%) respondents scored $> 5$. The most frequently scored for questions were – heightened awareness of potential dangers (6), irritability or outbursts of anger (4), being jumpy or startled at something unexpected (4), feeling upset by reminders of the event (3), difficulty falling or staying asleep (3), difficulty concentrating (3), upsetting dreams about the event (1), acting or feeling as though the event were happening again (1), and bodily reactions when reminded of the event (1).

No statistical differences in age, years of prior experience, prior trauma rotation, number of major resuscitations, or

| Table 1: Demographics of participants screening positive versus negative on Trauma Screening Questionnaire |
| --- | --- | --- |
| **n** | **TSQ negative** | **TSQ positive** |
| Age | 39 (26–50) | 36 (33–39) |
| Male/female | 11/6 | 2/0 |
| Years of clinical experience | 5 (2–10) | 3.5 (2–5) |
| Prior trauma rotation | 4 | 0 |
| Months in SA | 6 (1–72) | 25 (3–48) |
| Major resus situations | 100 (0–500) | 290 (80–500) |

TSQ – Trauma Screening Questionnaire; SA – South Africa

Continuous variables provided as median (range)
length of stay in South Africa were observed in those scoring > 5 compared to < 6 in the TSQ questionnaire (Table I).

Discussion

We observed a 10.5% prevalence of probable PTSD among visiting international surgeons completing elective trauma placements in a major trauma centre in South Africa. This is lower than rates observed among general surgeons and trauma surgeons in the US and lower than local emergency service personnel. Importantly, only respondents who reported their personal safety was at risk scored for probable PTSD. No comments associated with clinical events or hospital environments were cited as stressors in this group.

Local South African populations have comparatively lower rates of PTSD (3.5%) than our study cohort despite a 73.8% lifetime prevalence of a traumatic event, suggesting a resilience to uncertain personal safety that international visitors may not be accustomed to. Orientation to local customs and culture is likely to be important for international staff.

Our survey response rate of 32% is lower than the response rate of local emergency service personnel (7–24%) and anaesthetists (24%), potentially due to the shorter 10-item questionnaire we chose for brevity. Although our rate of probable PTSD is lower, variations in screening questionnaires are acknowledged, which make comparisons difficult. For example, the 22-item Impact of Event Scale – Revised (IES-R) tool used by the latter two studies had improved specificity and sensitivity compared to the TSQ questionnaire (0.91 and 0.82, respectively).14

In our study, we observed age, workplace experience and level of trauma exposure were not significantly associated with incidence of PTSD. This is similar to some4,14 but not all studies.1,17 The relatively low rate of probable PTSD in this cohort may be related to the elective role of these surgeons as the clinical responsibility is ultimately held by a local consultant surgeon. Similarly, lower rates of PTSD were observed in US year-1 postgraduate doctors compared to senior consultant surgeons suggesting level of responsibility may be a factor of relevance.4,17 Our elective programme includes full time work that is closely supervised by attending trauma surgeons.

Among international surgeons, factors associated with higher rates of PTSD are – those operating more than 15 trauma cases per month, having more than seven call duties per month, having less than four hours of relaxation per day, those working in a poor hospital culture with less access to trauma cases per month, having more than seven call duties higher rates of PTSD – those operating more than 15 by attending trauma surgeons.

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is sparse; further study to determine the scale of problem and potential protective factors is urgently required.

**Conflict of interest**
The authors declare no conflict of interest.

**Funding source**
No funding was required.

**Ethical approval**
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