

Prevalence of post-traumatic stress disorder among the survivors of two suicide bombings in Iraq

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The prevalence rates of post-traumatic stress disorder (PTSD) and subthreshold PTSD (SPTSD) were measured in 258 survivors of two suicide bombings in Karbala, Iraq, 2 months after the incidents. Of the total sample, 112 (43.4%) had PTSD and 59 (22.9%) had SPTSD. PTSD was more prevalent after the incident that was associated with more civilian deaths.

Post-traumatic stress disorder (PTSD) is common following disasters, especially man-made ones (Neria *et al.*, 2008). Patients can develop some but not all of the symptoms of PTSD, a condition sometimes called subthreshold PTSD (SPTSD), which can still reflect significant clinical and psychosocial impairment (Zlotnick *et al.*, 2002).

Between 2003 and 2010 there were more than 1000 suicide bombings in Iraq, resulting in more than 12000 civilian deaths (Hicks *et al.*, 2011). In April 2007, there were two such incidents in Karbala city, 120 km south-west of Baghdad, with an estimated population of 800000. The first occurred on 14 April, at a crowded bus station, and at least 46 people were killed; the second occurred on 28 April and killed 73 (see <http://www.iraqbodycount.org/database>). We report on the prevalence of PTSD and SPTSD among survivors of these two incidents.

Method

Karbala Health Authority developed this project in order to screen for PTSD in survivors of terrorist incidents in the city. Those who screened positive were offered further assessment and psychiatric intervention. A team of one consultant psychiatrist (AH), three general practitioners and eight health workers was assembled. AH provided the rest of the team with training, which consisted of three 3-hour sessions of lectures, interactive exercises and mock interviews. It covered the theoretical and clinical aspects of PTSD and the use of the Arabic version of the PTSD module (module I) of the Mini-International Neuropsychiatric Interview (MINI).

The team surveyed the scenes of the two incidents 4 days after the attacks. All those shops which had a direct view of the scenes were visited. Workers aged 16 and over who were present during our visits were approached. No attempt was made to contact workers who were not present during our visits. Those who had witnessed the incidents

and who gave verbal consent to be interviewed at a later date were included in this study. Apart from 17 people, all who were approached gave consent and were interviewed. None of the participants had suffered physical injury as a result of the attacks (possibly because those injured were absent, as they were still receiving treatment). They were interviewed at the Primary Healthcare Centre 2 months following the incidents by two professionals from the same team described above. Interviews took about 20 minutes. Demographic details were recorded and the MINI was administered. Scores were agreed by the two professionals.

The MINI is a brief, reliable and valid structured diagnostic interview (Lecrubier *et al.*, 1997; Sheehan *et al.*, 1997). The PTSD module (module I) follows the DSM-IV criteria for PTSD (Sheehan *et al.*, 1998). Six criteria need to be met:

- 1 experiencing or witnessing a traumatic event
- 2 response with intense fear
- 3 intrusion symptoms
- 4 avoidance or numbing (at least three symptoms out of a list of seven)
- 5 hyperarousal (at least two symptoms out of a list of five)
- 6 interference with functioning.

We followed Blanchard *et al.* (1994) in their definition of SPTSD. SPTSD was defined by the fulfilment of criteria 1, 2, 3, 6 and either 4 or 5. This is a widely used definition of SPTSD, with a very good level of agreement with a definition based on the presence of a clinically significant distress or impairment (Franklin *et al.*, 2002).

Analysis

Numbers and percentages of patients with PTSD and SPTSD were calculated and compared across other variables using χ^2 tests. Multinomial logistic regression was used to test for correlates of PTSD and SPTSD diagnoses. All analyses used SPSS for Windows, version 19.

Results

In total, we interviewed 258 people: 139 who witnessed the first incident and 119 who witnessed the second incident. The majority (251; 97.3%) were male, because shops in the city are owned and staffed mostly by men. Demographic and clinical characteristics are summarised in Table 1.

Table 1

Demographic and other characteristics of participants with no PTSD, PTSD and SPTSD

Variable		No PTSD (<i>n</i> = 87; 33.7% of sample)		SPTSD (<i>n</i> = 59; ^a 22.9% of sample)		Full PTSD (<i>n</i> = 112; 43.4% of sample)		χ^2	<i>P</i>
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Incident	First incident	54	38.8	36	25.9	49	35.3	8.182	0.01
	Second incident	33	27.7	23	19.3	63	52.9		
Gender	Female	1	14.3	2	28.6	4	57.1	1.221	0.54
	Male	86	34.3	57	22.7	108	43.0		
Age group	< 20	7	36.8	5	26.3	7	36.8	10.538	0.22
	20–29	28	28.6	20	20.4	50	51.0		
	30–39	28	35.0	24	30.0	28	35.0		
	40–49	11	30.6	7	19.4	18	50.0		
	50–59	13	52.0	3	12.0	9	36.0		
Marital status	Single	28	37.8	15	20.3	31	41.9	2.999	0.82
	Married	58	32.6	42	23.6	78	43.8		
	Divorced	0	0.0	1	33.3	2	66.7		
	Widow	1	50.0	0	0.0	1	50.0		

PTSD, post-traumatic stress disorder; SPTSD, subthreshold PTSD.

^aMarital status not recorded in one instance.

Of our total sample, 112 (43.4%) met the diagnostic criteria for PTSD and 59 (22.9%) for SPTSD. We used multinomial logistic regression with diagnosis as the dependent variable (no PTSD as a reference category) and incident (first or second), gender, age group and marital status as predictors. This revealed only one significant association: PTSD was more prevalent among the witnesses to the second incident (which had led to more civilian deaths) than the first incident (odds ratio 1.97, 95% confidence interval 1.08–3.61; $P = 0.02$)

Discussion

This study investigated the prevalence of PTSD and SPTSD among the survivors of two suicide bombings in Karbala, Iraq. As expected, the prevalence of PTSD in our sample (43.4%) was much higher than the 2.5% lifetime prevalence of PTSD in the general population found by the Iraq Mental Health Survey (Alhasnawi *et al*, 2009). Direct exposure to disasters is suggested to be the most important risk factor for PTSD (Galea *et al*, 2005), as it leads to the highest rates, from 30% to 40% (Galea *et al*, 2005; Neria *et al*, 2008).

The prevalence of SPTSD in our study is comparable to that reported in studies employing a similar definition to the one we used (Galea *et al*, 2003). The fact that participants were interviewed 2 months after the attacks in our study is another reason for the high rates. Previous reviews of PTSD following disasters, including man-made incidents, concluded that prevalence rates decline over time (Galea *et al*, 2005; Neria *et al*, 2008).

The prevalence of PTSD was significantly higher after the second incident, which was associated with more civilian deaths. Neria *et al* (2008) in their review suggested that the frequency of fatalities is one of the predictors of a high rate of PTSD. However, other risk factors (see Limitations, below)

might have contributed to the difference. Female gender was not a predictor of PTSD in our study, in contrast to previous research (Galea *et al*, 2005), but this could be because our sample included only seven women.

This study highlights the need to explore the concept of SPTSD further, especially in light of its association with clinical and psychosocial impairment (Zlotnick *et al*, 2002). It raises again the issue of the 'threshold dilemma' (Horowitz, 1987) and the number of criteria sufficient to diagnose PTSD.

The Iraqi context

This study provides some support for the trans-cultural validity of PTSD as a diagnostic category in Iraq, at least in the immediate aftermath of a major traumatic event. The cross-sectional nature of this study limits our ability to answer the question of whether PTSD, as a reaction to trauma, would remain valid in the long term in Iraq. It is possible that, in the long term, the psychiatric consequences of trauma might present in a different way, for instance as anxiety disorders, which were found by the Iraq Mental Health Survey to be the most common class of disorders (Alhasnawi *et al*, 2009).

The high rates of PTSD and SPTSD in this study raise important questions in relation to service provision, especially as the Iraq Mental Health Survey found that only 10.8% of patients with diagnosable mental disorder receive treatment (Alhasnawi *et al*, 2009). The fact that the mainstay of treatment for PTSD is psychological therapy, for example cognitive-behavioural therapy (CBT), highlights the difficulties even further in light of the very limited resources for such treatment in Iraq. It is worth noting here that training in CBT has recently become mandatory for members of the Iraqi Board of Psychiatry (Al-Uzri *et al*, 2012).

Limitations

One limitation of this study is that the concept investigated (PTSD) and the instruments used to measure it are Western. The transcultural applicability of PTSD has been challenged by a number of authors (e.g. Bracken *et al*, 1995). However, others have suggested that the criteria for PTSD are useful across cultures (Cheung, 1994) and that the similarity between the findings in different cultures supports the wide applicability of the concept (Njenga *et al*, 2004). A qualitative approach might be helpful in this area.

Another limitation of this study is that we did not control for the presence of psychiatric illness, which is a risk factor for PTSD (Galea *et al*, 2005). Other risk factors which were not measured include low socioeconomic status, poor coping skills and psychological factors such as anger and external locus of control (Galea *et al*, 2005). There were no injured individuals in our sample and therefore any conclusions cannot be generalised to this specific group. We did not investigate whether participants were exposed to previous incidents or whether PTSD existed prior to the attacks, because the design of this governmental project was to screen for possible cases to be offered further assessment and intervention by the psychiatric services; therefore, we use the term 'prevalence' in this study rather than 'incidence' (Galea *et al*, 2005).

Conclusion

This study confirms that the prevalence of PTSD is high following terrorist attacks. A large proportion of victims develop symptoms which are insufficient to diagnose PTSD (SPTSD). However, those patients could still experience significant impairment.

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Fundraising trek to Burma, 7–17 February 2014

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