Brief report

The effect of prolonged exposure to war stress on the comorbidity of PTSD and depression among hospital personnel

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A B S T R A C T

The relationship between exposure to war stress and to traumatic and depressive symptoms among hospital personnel is understudied. Hospital personnel who were exposed to frequent missile attacks and casualties of war, both military and civilians (n = 106), were assessed for posttraumatic stress disorder (PTSD) symptoms and depression a month after the war between Lebanon and Israel erupted. Increased risk for PTSD symptoms was found to be highly associated with increased risk for depression. Logistic regression analysis showed that hospital personnel with increased risk for PTSD symptoms had a significantly elevated risk for depression in comparison to hospital personnel without increased risk for PTSD symptoms (odds ratio = 18.86, 95%CI = 4.08–87.07). These findings show that hospital personnel exposed to prolonged war stress exhibited higher levels of depression in comparison to previous single exposure researches. No profession differences were found in the levels of depression, but physicians were found to be less vulnerable than other hospital staff to develop PTSD symptoms. PTSD symptoms were significantly associated with depression. The results warrant further longitudinal study.

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1. Introduction

The connection between traumatic exposure and the clinical phenomena of posttraumatic stress disorder (PTSD) is well established in the literature as presented in DSM-IV (American Psychiatric Association, 1994). Other psychiatric conditions, however, are known to occur in the aftermath of trauma (Breslau et al., 1991; Kozari-Koval et al., 2001). One of the most prevalent psychiatric conditions that develops after traumatic exposure is depression (Creamer et al., 2001; Grieger et al., 2003). There is a debate in the literature about the connection between PTSD and depression (Roberts and Robbins, 2006). The general consensus is that most cases of post-exposure depression are comorbid with PTSD. In addition, there are some independent cases in which depression and posttraumatic symptoms are presented alone as a result of exposure to the trauma (Shalev et al., 1998; O’Donnell et al., 2004). In recent years there has been a plethora of research on the effects of exposure to traumatic events on emergency and rescue personnel (Guo et al., 2004; Elhai et al., 2006; Witteveen et al., 2006; Long et al., 2007). However, medical personnel are still an understudied group among all other emergency and rescue personnel (Firth-Cozens et al., 1999; Weinberg and Creed, 2000; Luce et al., 2002; Ben-Ezra et al., 2007). One of the most frequently exposed but understudied populations is hospital personnel (Ben-Ezra et al., 2007). This group is exposed to extreme and prolonged stressful situations that make hospital personnel a risk group for psychiatric morbidity. On the other hand, this group is considered to be resilient due to its high level of activity and perceived control over stressful situations (Firth-Cozens et al., 1999; Weinberg and Creed, 2000).

Few studies have systematically examined the effect of exposure to extreme stress on hospital personnel (Luce et al., 2002; Hodgetts et al., 2003). Prior studies examined exposure to victims of bombings, terror attacks and sniper shootings which represented only a single trauma or indirect exposure to multiple traumas (Luce et al., 2002; Hodgetts et al., 2003; Kerasiotis and Motta, 2004; Weiniger et al., 2006). To the best of our knowledge, no studies have assessed the comorbidity between PTSD and depression among hospital personnel exposed to war stress. Earlier studies that measured PTSD symptoms among hospital personnel did it only after a single traumatic event, and neglected to measure depressive symptoms. We extend our previous preliminary report (Ben-Ezra et al., 2007) by adding an administrative staff group, and we examine depressive symptoms as well. We hypothesized that among hospital personnel with increased risk for...
PTSD symptoms there would also be an increased risk for clinical depression. We also hypothesized that physicians would show lower levels of PTSD and depression symptoms in comparison to nurses and administrative staff.

2. Methods

2.1. Events

On 12 July 2006 at 09:30 h, war erupted between Israel and Lebanon. Israel suffered 163 fatalities (44 civilians and 119 soldiers) and 2400 wounded (2000 civilians and 400 soldiers). During the war the Northern city of Haifa was targeted by hundreds of missiles. The Rambam hospital is the largest and most important hospital in northern Israel and serves a population of one million people with 75,000 hospitalizations and 500,000 admissions each year. A large proportion of the civilians and military casualties were admitted to the hospital during the war. The hospital itself was also targeted, with 40 missiles landing in the hospital vicinity.

2.2. Sample

A sample of hospital personnel was selected at random at week 5 after the war began. The initial sample included physicians, nurses and administrative staff (n = 127). The response rate was 84%. Those who declined were asked about their reasons for refusal. The most common reason for refusing was ‘no time’. The final sample consisted of 106 participants, 38 physicians, 42 nurses, and 26 administrative personnel (see Table 1). The information regarding the group of physicians and nurses (without the Center for Epidemiologic Studies-Depression questionnaire, and the administrative staff group) is identical to a preliminary study (Ben-Ezra et al., 2007). There were no significant differences between respondents and participants who refused to answer the questionnaire in demographic data (age, gender, profession). The study took the form of a short screening interview and survey. None of the participants reported a history of mental disorders or prior exposure to war-related stress. All the participants were under missile attacks with immediate threat to life and exposure to war casualties, both military and civilian. All the participants signed an informed consent.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tr>
<td>Participants` characteristics according to profession (N=106).</td>
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<table>
<thead>
<tr>
<th></th>
<th>Physicians (n = 38)</th>
<th>Nurses (n = 42)</th>
<th>Administrative personnel (n = 26)</th>
<th>Test statistics</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y (SD)</td>
<td>36.34 (8.65)</td>
<td>33.92 (8.89)</td>
<td>34.69 (14.04)</td>
<td>F(2,105) = .57</td>
<td>0.570</td>
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<tr>
<td>Sex, N (%)</td>
<td></td>
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<tr>
<td>Male, n</td>
<td>27 (71.1)</td>
<td>38 (90.5)</td>
<td>22 (84.6)</td>
<td>χ² = 21.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Female, n</td>
<td>11 (28.9)</td>
<td>4 (9.5)</td>
<td>4 (15.4)</td>
<td></td>
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<tr>
<td>Marital status, n (%)</td>
<td></td>
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<tr>
<td>Single, n</td>
<td>11 (29)</td>
<td>13 (31)</td>
<td>6 (23)</td>
<td>χ² = 3.61</td>
<td>0.058</td>
</tr>
<tr>
<td>Married, n</td>
<td>26 (71)</td>
<td>29 (69)</td>
<td>20 (77)</td>
<td></td>
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<tr>
<td>Divorced, n</td>
<td>1 (3)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
<td></td>
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<tr>
<td>Separated, n</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IES-R score: M (SD)</td>
<td>15.24 (11.41)</td>
<td>26.50 (16.38)</td>
<td>14.59 (6.70)</td>
<td>F(2,106) = 8.96</td>
<td>0.001</td>
</tr>
<tr>
<td>CES-D score: M (SD)</td>
<td>14.59 (6.70)</td>
<td>18.57 (10.14)</td>
<td>18.37 (10.14)</td>
<td>F(2,105) = 2.38</td>
<td>0.097</td>
</tr>
<tr>
<td>Increased risk for PTSD (IES-R = &gt; 33), n (%)</td>
<td>4 (10.5)</td>
<td>15 (35.7)</td>
<td>7 (25.9)</td>
<td>χ² = 6.99</td>
<td>0.032</td>
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<tr>
<td>Increased risk for depression (CES-D = &gt; 16), n (%)</td>
<td>18 (48.6)</td>
<td>23 (54.8)</td>
<td>16 (61.5)</td>
<td>χ² = 7.73</td>
<td>0.095</td>
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</table>

CES-D = Center for Epidemiologic Studies-Depression scale; a cutoff score of 16 indicates high risk for depression. IES-R = Impact of Event Scale – Revised; a cutoff score of 33 and above indicates high risk for PTSD.

2.3. Assessment and measures

Demographic measures included age, gender, marital status and profession. PTSD symptoms were assessed with the 22-item Impact of Event Scale-Revised (IES-R) (Weiss and Marmar, 1997), which rated severity of intrusion, avoidance, and hyperarousal symptoms over the past week on a 5-point severity scale (0 = not at all; 4 = extremely; alpha=0.92). The scoring was the sum of the items after the inversion of four positive items (range 0–88). Total scores of 33 or above indicated a clinical level of distress (Creamer et al., 2003).

Depressive symptoms were assessed with the 20-item Center for Epidemiologic Studies-Depression (CES-D) scale (Radloff, 1977), which rated symptoms over the past week on a 4-point severity scale (0 = Rarely or none of the time (less than 1 day); 3 = Most or all of the time (5–7 days); alpha=0.85). The scoring was the sum of the items after the inversion of four positive items (range 0–60). Total scores of 16 and above indicated increased risk for depression (Radloff, 1977).

2.4. Data analysis

Demographic differences between the groups were tested using one-way analysis of variance (ANOVA) and chi square tests. Analysis of covariance (ANCOVA) was used to assess the relationship between the total IES-R cutoff score (≥ 33 versus <33) and CES-D cutoff score (≥ 16 versus <16) while controlling for age, gender, marital status, and profession. Logistic regression analyses with CES-D cutoff (≥ 16 versus <16) as the dependent variable were performed to determine the degree to which demographic and PTSD symptoms variables (age, gender, marital status, profession, IES-R cutoff ≥ 33 versus <33) were associated with high levels of depressive symptoms. Odds ratios and 95% confidence intervals were determined. All the analyses were conducted using SPSS programs (SPSS, version 11.5, Chicago, IL).

3. Results

More than half of the sample (53.7%) was at risk for depression. The comorbidity for the critical cutoff for traumatic distress and risk for depression included 24 (22.6%) of the participants (Table 2). There were no differences in age and marital status between the groups. A significantly greater proportion of the sample consisted of women. Nurses and administrative staff had higher IES-R scores than physicians, and a greater proportion of them had an IES-R cutoff score ≥ 33 (Table 1).

When profession, age, gender, marital status, and IES-R cutoff score ≥ 33 were entered into the logistic regression model, personnel who had increased risk for high levels of PTSD symptoms were 18.86 times more likely to endorse increased risk for depression (CES-D score ≥ 16; OR = 18.86, 95% CI = 4.08–87.07, Wald χ² = 14.16, df=1, 105, P = 0.01). No other demographic variable was significantly associated with increased risk for high levels of PTSD symptoms. In the ANCOVA, being at high risk for PTSD symptoms (IES-R ≥ 33) was associated with increased risk for depression while controlling for age, gender, marital status, and profession (F = 25.19, df=1, 105, P = 0.01). No other factors were found to be significant.
4. Discussion

Less than one quarter (24.3%) of the hospital personnel sampled had symptoms of posttraumatic stress rising to the level of clinical concern. These results support earlier studies on hospital personnel in other traumatic settings (Grieger et al., 2003; Hodgetts et al., 2003). In addition, more than half of the hospital personnel (53.8%) were at risk for clinical depression. The relatively high levels of posttraumatic stress symptoms and especially the high risk for depression among hospital personnel indicate that under extreme and prolonged war stress, medical personnel may not be as resilient as some studies have suggested (Firth-Cozens et al., 1999; Weinberg and Creed, 2000; Ben-Ezra et al., 2007). As mentioned in Section 3, most of the cases with a clinical level of posttraumatic stress (92.3%) had comorbidity with increased risk for clinical depression. Actually it was found that personnel who were at risk for high levels of PTSD symptoms were 18.86 times more likely to endorse increased risk for depression. The comorbidity of traumatic symptoms with depressive symptoms is known to be connected to greater symptom severity and lower levels of functioning (Shalev et al., 1998; O'Donnell et al., 2004). Clearly, some of these extreme results may be due to the fact that in addition to treating seriously injured or dying patients, hospital personnel also had concerns for their own lives as a result of the incoming missiles that targeted the hospital.

The quantitative data also may suggest that the effect of that profession has a differential impact on hospital personnel. Compared with physicians, both nurses and administrative staff had a significantly higher risk for clinical symptoms of posttraumatic stress. Higher levels of posttraumatic stress symptoms among nurses have been found in other studies (Luce et al., 2002; Grieger et al., 2003; Ben-Ezra et al., 2007).

Our results are in line with earlier studies that showed that even exposure to a single traumatic event affects nurses more than physicians (Luce et al., 2002; Grieger et al., 2003). However, no such significant differences were found in the risk for depressive symptoms. It is possible that posttraumatic symptoms that were found in earlier studies were connected to the exposure to traumatic stress, but the depressive symptoms were connected to the prolonged war stress. Therefore, depression levels were elevated and relatively equivalent across all the groups. This also could possibly explain why the phenomenon of clinical posttraumatic symptoms without risk for depressive symptoms was almost absent in the present study.

There are several limitations to this study. First, no actual diagnosis was made. With self-report measures, participants might have tried to be consistent across the two questionnaires. However, other studies (e.g., Creamer et al., 2001) have shown that using a cutoff score of 33 for the IES-R has the best diagnostic accuracy for predicting PTSD symptoms according to DSM-IV criteria. In addition, using a cutoff score of 16 for the CES-D has the best diagnostic accuracy for predicting depressive symptoms according to DSM-IV criteria. A second limitation is the study’s cross-sectional design. Longitudinal studies are needed, preferably with an assessment prior to severe events and with follow-up assessments to study the course of symptoms. Thirdly, the IES-R and CES-D measures might be confounded by having related items such as sleep disturbances.

Future studies should assess the nature of wartime exposures (patient contact versus personal threat of injury or death) to assess the relative contribution of different exposures to the development of stress symptoms. Although exposure to prolonged war stress with actual threat to life is understudied in general and especially in hospital personnel, its consequences can be severe. Since it is likely hospital personnel will be affected by crises like this in the future, policies for preventing and reducing the prevalence of PTSD and especially of depressive symptoms should be accompanied by action to mitigate the effects of war stress on the mental health of hospital personnel who are generally under elevated stress in the hospital setting.

References


