PTSD Among Israeli Former Prisoners of War and Soldiers With Combat Stress Reaction: A Longitudinal Study

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Objective: The aim of this study was to assess the long-term impact of war captivity and combat stress reaction on rates of posttraumatic stress disorder (PTSD) in Israeli veterans of the 1973 Yom Kippur war. Method: One hundred sixty-four former prisoners of war (POWs), 112 veterans who had had combat stress reaction, and 184 combat veteran comparison subjects filled out the PTSD Inventory, a self-report scale based on the DSM-III-R criteria for PTSD. The inventory diagnoses past and present PTSD, assesses its intensity, and provides a symptom profile. Results: Thirty-seven percent of the veterans who had had combat stress reaction, 23% of the former POWs, and 14% of the comparison subjects had had diagnosable PTSD at some time in the past. The current rates were 13%, 13%, and 3%, respectively. The results showed different recovery rates over time: almost two-thirds of the veterans with combat stress reaction who had had PTSD in the past recovered, while less than one-half of the POW group showed this improvement. Conclusions: These findings indicate that small but significant proportions of the POWs and veterans with combat stress reaction were still suffering from PTSD almost two decades after the war. The different recovery rates in the two groups may reflect the differences in duration and severity of stressors, the impact of immediate intervention on long-term adjustment, or both.

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Participation in combat is a known pathogenic stressor. Soldiers are exposed to dangers, such as loss of life, injury, and the death of comrades, as well as to harsh physical conditions, such as extreme weather, lack of sleep, lack of food, and inadequate hygiene. Isolation, loneliness, loss of family support, sexual deprivation, and loss of privacy are also prevalent (1). Soldiers are considered to be particularly at risk for posttraumatic stress disorder (PTSD). However, opinion is divided regarding the expected scope, intensity, and duration of the disturbance. The literature (2) presents two contrasting hypotheses. The residual stress hypothesis states that exposure to extreme stress generally has severe long-term effects (3, 4); the stress evaporation hypothesis contends that the effects of extreme stress are generally immediate, superficial, and transient (5, 6). Research has provided partial support for each of these approaches (4, 7). This study examined long-term stress residues in two groups of soldiers who are considered to bear a particularly high risk of PTSD: those who become prisoners of war (POWs) and those with combat stress reaction.

PRISONERS OF WAR

All combatants are exposed to a surfeit of stressors and threatening experiences, but for POWs this exposure is intensified and compounded. Falling captive leads to loss of identity as an active combatant, guilt, a sense of failure, and shame. The captivity experience is characterized by loss of personal freedom and control over one's life, physical and psychological torture, and extreme frustration and humiliation.

A number of studies have examined the long-term psychiatric effects of war captivity and found that various psychiatric disturbances may be prevalent, even decades after release (8-13). PTSD, which is characterized by intrusive recollections of the traumatic event, psychic numbing, and symptoms of autonomic nervous system arousal (DSM-III-R), may be particularly prevalent among POWs. Studies that have examined the prevalence of PTSD in American World War II POWs have found high rates of current PTSD, ranging from 29% (14) to around 50% (15, 16), but there are also signs of significant recovery over time (11, 14). Goldstein et al. (15) examined the symptom profiles of for-
mer POWs 40 years after their release by the Japanese. They found that the most prevalent symptoms were sleep disturbances, recurrent dreams of an event, and recurrent and intrusive recollections of the event.

Close examination of studies of PTSD in POWs reveals several methodological limitations. First, none of these studies has compared POWs with other subjects. This raises the question of whether the findings reflect the effects of captivity or other experiences, such as participation in combat. Another common problem relates to sampling. Some studies have examined small and unrepresentative convenience samples (11, 13, 15); others have had very low response rates (16). Thus, there is great importance in a systematic large-scale study that can provide reliable data regarding posttraumatic stress residues in this unique group.

SOLDIERS WITH COMBAT STRESS REACTION

Participation in combat may entail immediate psychological impairment, most often in the form of combat stress reaction. This response occurs when a soldier is unable to marshal effective coping mechanisms to deal with the onslaught of threatening stimuli. It consists of a wide range of labile and polymorphic manifestations, including restlessness, psychomotor deficiencies, withdrawal, increased sympathetic nervous system activity, stuttering, confusion, nausea, vomiting, and paranoid responses (17, 18). The defining feature is that the soldier ceases to function militarily and acts in a manner that endangers himself and his fellow combatants (19).

PTSD has been found to be one of the long-term sequelae of combat stress reaction (20, 21). A previous study by our group examined veterans with combat stress reaction and comparison subjects 1 year after the 1982 war in Lebanon and found that 63% of the soldiers who had had combat stress reaction, but only 16% of the comparison subjects, were suffering from PTSD. PTSD rates were found to recede over time, and 3 years after the war, the rates in the two groups were 43% and 10%, respectively (21). The most prominent symptoms among the veterans with combat stress reaction who developed PTSD were recurrence of scenes and thoughts, sleep difficulties, and loss of interest in previously enjoyed activities (20). Although these findings provided a picture of rates and patterns of impairment as well as recovery trends in persons with combat stress reaction, they did not address the need for a long-term follow-up.

PTSD is a generic diagnosis that may apply after exposure to any kind of extreme stressor. However, studies to date have generally examined its prevalence in persons exposed to only one type of stressor. This study examined PTSD in three groups of combat veterans almost 20 years after their exposure to different types of stressful events. The study examined three main questions: 1) To what degree do POWs and soldiers with combat stress reaction suffer from PTSD? 2) Is it possible to differentiate a characteristic PTSD symptom profile in each of these groups? 3) Do these groups display different recovery rates?

METHOD

Subjects

This study examined 460 Israeli veterans of the 1973 Yom Kippur war who were divided into the following three groups. Soldiers who had had combat stress reaction. The research team obtained the medical records of one treatment installation at which clinicians had diagnosed and treated a total of 178 soldiers with combat stress reaction during the Yom Kippur war. Nine of these men were abroad at the time of the study. We approached the remaining 169, and 112 of them participated in the study, constituting a 66.3% response rate.

POWs. According to Israel Ministry of Defense records, there were 242 POWs from the Israeli army, air force, and navy. Forty-seven (19.4%) of these POWs were from the Israeli army and air force after the Yom Kippur war. Three of these men have since died, and 20 were living abroad at the time of the study. We approached the remaining 217 former POWs residing in Israel at the time of the study, and 164 of them participated, constituting a 75.6% response rate.

Comparison subjects. A group of 280 combat veterans of the Yom Kippur war, matched to the POWs in personal and military background, was drawn from Israel Defense Forces computerized data-banks. Of these men, 20 were abroad at the time of the study and five were deceased. We approached the remaining 255, and 184 of them participated in the study, constituting a 72.2% response rate.

Examination of sociodemographic variables revealed that ethnic backgrounds were similar in the three groups: the father's country of origin was Israel in 7% of cases, Asia or Africa in 37%, and Europe or America in 56%. The groups were found to differ somewhat, however, in age, marital status, educational background, and previous war experience. The soldiers with combat stress reaction tended to be older (mean age=22 years, SD=3.8) than the POWs (mean age=22 years, SD=3.5) and the comparison subjects (mean age=22 years, SD=3.6) (F=27.4, df=2, 405, p<0.001), and more of them were married at the time of the war (61% of the combat stress reaction group versus 26% of the POWs and comparison subjects; χ²=44.0, df=2, p<0.001). They had a lower level of education at that time (59% of the combat stress reaction group had a complete high school education, compared with 67% of the POWs and 74% of the comparison subjects) (χ²=8.0, df=2, p<0.01), and they were more likely to have had previous war experience (70% of the combat stress reaction group versus 38% of the POWs and 50% of the comparison subjects) (χ²=27.1, df=2, p<0.001).

Procedure

The potential subjects were sent letters inviting them to the Rehabilitation Department of the Sheba Medical Center at Tel Hashomer. The letter explained that as part of the Israel Defense Forces' concern for soldiers' well-being, they were being asked to take part in a study whose purpose was to assess the mental status of soldiers. A few days after the letters were sent, telephone calls were made to all potential subjects to explain again the purpose of the study and to schedule participation.

The veterans who agreed to participate were seated in groups of 30-50 and filled out a large battery of questionnaires, including the PTSD Inventory. The current version of the PTSD Inventory is a self-report scale based on the DSM-III-R criteria that aids in the diagnosis of a person as suffering from PTSD. It assesses both the intensity (number of symptoms) and the differential symptom profile of the syndrome. This version is a revision of the earlier PTSD Inventory, which was based on DSM-III criteria. The earlier version was reviewed favorably in a survey of PTSD assessment instruments (22). The current questionnaire consists of 17 statements corresponding to the 17 PTSD symptoms listed in DSM-III-R. Subjects are asked to indicate for each statement whether or not they suffered from the symptom in two given periods: "during the last month" (called "the present" in this report) and "in the past." Internal consistency among the 17 items for both periods was high (Cronbach alpha=0.89 for the past and 0.86 for the present), and the scale was found to have a high convergent validity (23) when compared with diagnoses based on the Structured Clinical Interview for DSM-III-R (24).
TABLE 1. Rates of Past and Present DSM-III-R PTSD and PTSD Symptom Categories in Three Groups of Israeli Combat Veterans of the 1973 Yom Kippur War

<table>
<thead>
<tr>
<th>Time/PTSD Symptom Category</th>
<th>Former Prisoners of War (N=164)</th>
<th>Soldiers Who Had Combat Stress Reaction (N=112)</th>
<th>Comparison Subjects (N=184)</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Past</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full syndrome</td>
<td>38</td>
<td>23.2</td>
<td>41</td>
<td>36.6</td>
</tr>
<tr>
<td>Intrusion (criterion B)</td>
<td>147</td>
<td>89.6</td>
<td>101</td>
<td>90.2</td>
</tr>
<tr>
<td>Avoidance (criterion C)</td>
<td>42</td>
<td>25.6</td>
<td>42</td>
<td>37.5</td>
</tr>
<tr>
<td>Arousal (criterion D)</td>
<td>99</td>
<td>60.4</td>
<td>81</td>
<td>72.3</td>
</tr>
<tr>
<td>Present</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full syndrome</td>
<td>21</td>
<td>12.8</td>
<td>15</td>
<td>13.4</td>
</tr>
<tr>
<td>Intrusion (criterion B)</td>
<td>70</td>
<td>42.7</td>
<td>43</td>
<td>38.4</td>
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<tr>
<td>Avoidance (criterion C)</td>
<td>24</td>
<td>14.6</td>
<td>20</td>
<td>17.9</td>
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<tr>
<td>Arousal (criterion D)</td>
<td>55</td>
<td>33.5</td>
<td>39</td>
<td>34.8</td>
</tr>
</tbody>
</table>

a p<0.01.  
b p<0.001.  
c p<0.05.

TABLE 2. Past and Present DSM-III-R PTSD Symptoms in Three Groups of Israeli Combat Veterans of the 1973 Yom Kippur War

<table>
<thead>
<tr>
<th>Time/PTSD Symptom Category</th>
<th>Former Prisoners of War (N=164)</th>
<th>Soldiers Who Had Combat Stress Reaction (N=112)</th>
<th>Comparison Subjects (N=184)</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Past</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusion (criterion B)</td>
<td>2.26</td>
<td>1.25</td>
<td>2.45</td>
<td>1.27</td>
</tr>
<tr>
<td>Avoidance (criterion C)</td>
<td>1.80</td>
<td>1.93</td>
<td>2.14</td>
<td>1.99</td>
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<tr>
<td>Arousal (criterion D)</td>
<td>2.59</td>
<td>2.21</td>
<td>3.06</td>
<td>2.06</td>
</tr>
<tr>
<td>Total</td>
<td>6.65</td>
<td>4.68</td>
<td>7.65</td>
<td>4.60</td>
</tr>
<tr>
<td>Present</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrusion (criterion B)</td>
<td>0.97</td>
<td>1.35</td>
<td>0.85</td>
<td>1.30</td>
</tr>
<tr>
<td>Avoidance (criterion C)</td>
<td>1.04</td>
<td>1.68</td>
<td>1.16</td>
<td>1.71</td>
</tr>
<tr>
<td>Arousal (criterion D)</td>
<td>1.49</td>
<td>2.09</td>
<td>1.40</td>
<td>1.87</td>
</tr>
<tr>
<td>Total</td>
<td>3.50</td>
<td>4.52</td>
<td>3.94</td>
<td>4.13</td>
</tr>
</tbody>
</table>

a p<0.01.  
b p<0.001.  
c p<0.05.

The questionnaire session lasted approximately 2 hours, including a short break. Some of the veterans, who were unable to attend at the hospital, were administered the questionnaires at home. Before they filled out the questionnaires, all subjects signed informed consent forms and were assured that the data would remain confidential, in no way affecting their status in military or civilian life.

RESULTS

Table 1 shows the numbers of subjects meeting each of the DSM-III-R criteria for PTSD and the rates of PTSD diagnosis, and table 2 shows the mean number of PTSD symptoms in each symptom category (criterion) endorsed by subjects in each group, for the past and the present. Analyses of variance (ANOVA) revealed that there were significant differences between groups in rates of PTSD diagnosis and in number of PTSD symptoms endorsed for each time period. These group differences were quite robust and were still evident when the ANOVAs were repeated as analyses of covariance, controlling for a series of background variables (previous war experience, age, marital status at the time of the war, and level of education at the time of the war). We may thus state with a relatively high degree of confidence that a significant proportion of the difference in PTSD pathology between the groups was related to their different wartime experiences.

Scheffé tests were performed to ascertain the source of the group differences in rates of PTSD diagnosis, and these indicate that PTSD was more prevalent among the soldiers who had combat stress reaction than among the former POWs and the comparison subjects in the past, but those with combat stress reaction and the former POWs displayed similar rates of PTSD in the present, and the rates in both groups exceeded the rate in the comparison group.

This finding suggests that the amount of reduction in PTSD rates over time differed across groups. Therefore, we conducted a two-way repeated measures ANOVA for study group (POW, combat stress reaction, and comparison) and time (past and present) on the dichotomous variable of PTSD diagnosis to examine changes
in PTSD rates over time both within and between groups. The results showed a main effect for group (F=11.01, df=2, 457, p<0.001) and for time (F=65.84, df=1, 457, p<0.001) as well as a significant interaction between the two (F=4.58, df=2, 457, p<0.05). These findings are demonstrated in figure 1, which shows that while all three groups showed collective improvement over time, time did not affect all of the groups in the same manner. Tests for simple main effects confirmed that the impact of time on PTSD rates was strongest in the combat stress reaction group (F=43.06, df=1, 457, p<0.001), where PTSD rates dropped by 23.2%, and was more moderate in the POW group (F=12.67, df=1, 457, p<0.001) and in the comparison group (F=15.33, df=1, 457, p<0.001), where PTSD rates dropped by 10.4% and 10.8%, respectively.

The different impact of time on the three groups was evident also when we examined individual recovery rates (i.e., the percentage of those who had had the full PTSD syndrome in the past but did not qualify for a formal PTSD diagnosis in the present). Recovery was evident in 76.9% of the comparison subjects and in almost two-thirds (63.4%) of the combat stress reaction veterans. However, only about one-half (44.7%) of the former POWs who had suffered from PTSD in the past were classified as not having PTSD at the time of the study. Thus, it appears that although the POWs developed the full PTSD syndrome less often than the subjects with combat stress reaction, their pathology was relatively more enduring and less likely to remit over time.

We examined the impact of sociodemographic variables on recovery from PTSD by conducting a series of comparisons between veterans who had recovered from PTSD and those still suffering from the full syndrome. Differences in background were evident in only one area—education: 62% of the recovered former POWs had completed at least a full high school education at the time of the war, compared with only 29% of the unrecovered former POWs (χ²=3.98, df=1, p<0.05). In the combat stress reaction group, the picture was similar (68% and 31%, respectively) (χ²=4.96, df=1, p<0.05).

Examination of the symptom profiles revealed that all of the groups had similar patterns of symptoms. Thus, the composition of the PTSD syndrome did not differ across groups, but its severity did. This was true for both past and present PTSD. As can be seen in figure 2, which presents the symptom profile for past PTSD, the former POWs displayed the highest level of symptoms, the combat stress reaction veterans the second highest, and the comparison group the lowest. In addition, it can be seen that not all symptoms were equally endorsed. The most highly endorsed symptoms were from the categories of intrusion and arousal.

It is also interesting to note that the DSM-III-R criterion that was most often met was criterion B (intrusion symptoms). This was the case in all groups, in both the present and the past (table 1). For example, 89.6% of the POWs met the criterion for this category in the past, while 25.6% met criterion C (avoidance symptoms) and 60.4% met criterion D (arousal symptoms).

However, this finding may be somewhat misleading, since a different number of symptoms must be endorsed to meet the criterion for each symptom category: the requirements are for at least three avoidance symptoms, at least two arousal symptoms, and only one intrusion symptom. If, instead of examining the percentage of subjects who met these different criteria, we examine the number of symptoms endorsed within each category (table 2), it is apparent that arousal symptoms were the most prevalent, both in the present and in the past. In fact, intrusion symptoms were the least prevalent of all kinds at the time of the study.

DISCUSSION

The findings show that at the time of the study, almost two decades after the Yom Kippur war, a small but significant number of former POWs and veterans who had had combat stress reaction (about 13%) were still suffering from diagnosable PTSD. This may be seen as reflecting a certain degree of vulnerability, but compared with findings in other studies of POWs, these rates are relatively low. Both Goldstein et al. (15) and Zeiss and Dickman (16), for example, found about 50% of former World War II POWs to be suffering from PTSD 40 years after release. The differences in PTSD rates between studies
FIGURE 2. Symptom Profiles for Past PTSD in Three Groups of Israeli Combat Veterans of the 1973 Yom Kippur War

PTSD SYMPTOM

Soldiers who had combat stress reaction
Former prisoners of war
Comparison subjects

- Intrusion
- Avoidance
- Arousal

PTSD SYMPTOM

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusion</td>
<td>1</td>
</tr>
<tr>
<td>Avoidance</td>
<td>2</td>
</tr>
<tr>
<td>Arousal</td>
<td>3</td>
</tr>
</tbody>
</table>

*Symptoms are numbered as follows. 1=Recurrent scenes or thoughts of the war. 2=Recurrent dreams and nightmares about the war. 3=Reliving the war. 4=Distress when exposed to things that recall the war. 5=Avoidance of thoughts or feelings about the war. 6=Avoidance of activities or situations that recall the war. 7=Difficulty remembering aspects of the war. 8=Loss of interest in significant activities. 9=Detachment or estrangement from others. 10=Restricted affect. 11=Foreshortened future. 12=Sleep difficulties. 13=Irritability. 14=Difficulty concentrating. 15=Hypervigilance. 16=Startle response. 17=Physiologic reactivity.*

may be attributed to differences in the duration and severity of the POW experience. POWs in the Far East, for example, were held captive for several years and were subjected to prolonged and extreme torture and to extremely harsh physical conditions (15). The Israeli POWs, by contrast, undoubtedly underwent some extremely stressful experiences, but these were somewhat less severe, and they were held for shorter periods of time (an average of 1.5 months in Egypt and 8 months in Syria) than the American World War II POWs.

Examination of the symptom profiles of the subjects with PTSD in the three groups reveals two important findings. First, the profiles of the three groups were more or less parallel (i.e., symptoms were endorsed with the same frequency relative to each other), but the severity of the syndrome as a whole differed between groups. This finding supports the notion that PTSD is a coherent and consistent syndrome; even when it stems from different stressors of varying intensities, it is apparently manifested as a single diagnostic entity. Moreover, the symptom profile revealed here strongly resembles the profile we found among Israeli veterans of the 1982 Lebanon war (20). Thus, we observed similar PTSD patterns, even though this study examined a different population of veterans from a different war. The second observation of note is that not all symptoms were reported with the same frequency. Despite the fact that the DSM classification gives each PTSD symptom equal weight, we found that some symptoms were far more common than others. The most common symptoms in the past, for example, included three intrusion symptoms (recurrent and intrusive distressing recollections of the event, recurrent distressing dreams of the event, and sudden acting or feeling as if the traumatic event were recurring) and two arousal symptoms (difficulty falling or staying asleep and hypervigilance). These findings are similar to previous findings, such as those of Goldstein et al. (15) and our group (20), who also found that avoidance symptoms were reported less frequently than other types.

When we examine the number of subjects who met each of the PTSD criteria, it appears that intrusion was the symptom category whose diagnostic criteria were most often met (criterion B, table 1). However, when the num-
ber of symptoms within each category is examined, a somewhat different picture emerges, and we see that the arousal symptoms were more prevalent, in both the past and the present, than any other type. In fact, intrusive symptoms were the least common of all types at the time of the study. The percentage of subjects who met each PTSD criterion is not a reliable indicator of symptom prevalence because each of the three symptom categories has a different threshold requirement. In order to meet criterion B, for example, the subject is required to endorse only one intrusive symptom, but criterion C requires the endorsement of at least three avoidance symptoms. Thus, it is not surprising that far more subjects met criterion B than met criterion C.

The findings regarding the different recovery rates in the three groups are particularly interesting. First, we found that the subjects in all three groups tended to recover over time, but their recovery was not complete. Symptoms became less prevalent but did not disappear entirely. In addition, recovery rates were not the same in the groups. The combat stress reaction group tended to have more recoveries than the POW group: almost two-thirds of the group with combat stress reaction who had had PTSD in the past no longer suffered from the syndrome at the time of the study, while only about one-half of the former POWs had recovered.

There may be a number of explanations for this difference in recovery rate. First, it may be related to differences in treatment received. The subjects in the combat stress reaction group, by definition, received treatment immediately after their breakdown. Although we do not know exactly how many continued to receive treatment afterward, it is reasonable to assume that many continued to receive some form of treatment. The former POWs, however, underwent debriefing upon release but did not receive any kind of organized treatment. Even if some did go on to receive treatment later, their repatriation process clearly did not include any kind of mental health intervention comparable to the treatment received by the soldiers with combat stress reaction. The importance of immediate intervention in stress reactions is well recognized in the literature (25), and the lack of it among the former POWs may thus explain their lower recovery rate.

Another explanation concerns the long-term impact of the severity of the stressors experienced by the two groups. Participation in combat is undoubtedly an extremely stressful experience, and the soldiers with combat stress reaction clearly faced some very stressful events. The POWs, however, underwent a doubly stressful experience: first they participated in intense combat, and this was followed by captivity, which involved another and more prolonged set of stressors. The former POWs' lower recovery rate may thus reflect their exposure to more severe and more prolonged stress.

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