Spousal Military Deployment as a Risk Factor for Postpartum Depression

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OBJECTIVE: To compare the Edinburgh Postnatal Depression Scale (EPDS) results in women whose spouses had deployed during or after pregnancy vs. those whose spouses had not.

STUDY DESIGN: A chart review of 6-week postpartum visits of women with active-duty spouses was conducted over 10 months. Associations between military deployments and EPDS score were examined by Student’s t test, and rates of positive screens (with a cutoff of ≥12) between groups were compared by odds ratio (OR). Linear regression was used to calculate predictors of EPDS score.

RESULTS: A total of 415 charts were analyzed. The average EPDS score of women whose partner did deploy during the pregnancy was 7.36 compared to 4.81 for those whose partners did not (p < 0.001). The percentage of positive screens for women whose partner deployed during the pregnancy was 25.27% compared with 10.94% for an OR of 2.75 (p < 0.001). Linear regression showed partner’s deployment during pregnancy to be an independent predictor of EPDS score (p < 0.005).

CONCLUSION: Deployment of a spouse during pregnancy may be a risk factor for depression. Aggressive screening of this at-risk population is recommended.


Keywords: depression, postpartum; military; postpartum care, risk assessment; risk factors; screening.

Postpartum depression (PPD) is among the most common serious complications of childbirth, with significant morbidity for the entire family of the affected individual.1-5 The burden of morbidity from PPD on both the patient and her family make the diagnosis and treatment of PPD imperative.

Given the serious morbidity of PPD, effective screening is essential. It has been shown that a formal screening program can decrease the number of affected women who go without treatment.6 The Edinburgh Postnatal Depression Scale (EPDS) developed by Cox et al7 is a screening instrument that is widely used and has been validated.8,9

An adequate screening process requires assessment not only of symptoms but also of risk factors. Risk factors that have shown a clear association

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with PPD include lack of social support, recent life stressors and spousal conflict. In recent years, military deployments, especially to combat zones, have increased in frequency. Given that deployment is a significant life stressor, and puts the spouse at risk of social isolation, it seems likely that deployment would be associated with increased risk of PPD. Additionally, data support the hypothesis that spousal deployment is a risk factor for depressive symptoms generally. However, the specific association between PPD and deployment has never been studied. This study examines spousal deployment as a risk factor for depressive symptoms in the postpartum period and underscores the importance of recognizing this risk factor in the process of screening for PPD.

Materials and Methods

Study Site

The Naval Medical Center, San Diego (NMCSD) is a major tertiary care facility, providing the care for 3,600 deliveries annually. A formalized screening program for PPD was instituted in NMCSD clinics in February 2006 in which mothers would be screened for depression at the 6-week postpartum visit. Although screenings were later instituted at other times and in other settings (i.e., at the 28- to 32-week obstetric appointment and at pediatric appointments), data from those visits were not included in this study. Mothers would fill out a screening form that included the EPDS, as well as questions about previous depression, previous or current treatment for depression, feelings of isolation and questions about personal deployment or deployment of a spouse. Results, including total EPDS score, were reviewed by the medical provider during the visit. Individuals with an EPDS score of ≥ 12 were classified as having a positive screen for PPD. Information as to whether the patient felt isolated, had previously suffered from clinical depression or had been on psychiatric medication were classified as yes/no based on patient response. Age was classified in years and weight of the child in pounds out to 2 decimal places. Patients were classified according to their responses to 2 of the screening questions: “Is your husband/partner currently deployed?” and “Did he deploy during your pregnancy?” Spousal deployment during pregnancy and during screening were not necessarily synonymous. Data regarding length of deployment for this cohort were not gathered. However, recent data show that for all sailors and marines returning to NMCSD, deployment length ranged from 1 to 17 months, with a mean of 5.4 months.

For each of the questions quoted above, total EPDS scores of women who answered yes vs. no were compared by Student’s t test. Rates of positive screening for PPD were compared by calculating odds ratio (OR) between groups. Statistical significance of OR was computed by Mann-Whitney tests.

A linear regression model was used to determine which screening questions had an impact on EPDS score. Any screening questions that had p < 0.05 were included in the model.

Results

There were a total of 450 charts reviewed. Of these, 415 answered every question on the EPDS, yielding a valid score, and 411 answered whether their spouse had deployed during their pregnancy. Descriptive statistics concerning the demographics of this group are presented in Table I. The number of individuals providing valid data on other questions is outlined in Table II.

We did not detect a significant difference in EPDS score based on the answer to the question “Is your
husband/partner currently deployed?" (p = 0.21). The mean total EPDS score of women who answered yes was 6.67 (SD = 6.24) as opposed to 5.08 (SD = 5.43) in those who answered no. Using a cutoff score of 12 on the EPDS, this yields an OR ratio of 1.50 for risk of a positive screen (p = 0.377).

The difference in EPDS score based on the answer to “Did your husband/partner deploy during your pregnancy?” was found to be statistically significant (p < 0.001). Those answering “yes” had a mean EPDS score of 7.36 (SD = 6.53) compared with 4.81 (SD = 5.20) for women answering no. Using the same cutoff on the EPDS, a yes answer has an OR for a positive screen of 2.79 (p = 0.002).

Comparisons of mean EPDS scores in all groups and rates of positive screens in each of the groups, classified by deployment status, are given in Figure 1.

Relationships between the EPDS question “The thought of harming myself has occurred to me . . . 3. yes, quite often; 2. sometimes; 1. hardly ever; 0. never” and deployment status were also examined. Neither deployment at the time of the screen nor deployment during the pregnancy were found to be predictive, regardless of cutoff used. There are no known suicides in this cohort.

Relationships between neonatal outcomes (birth weight and duration of gestation) and deployment status, as well as between neonatal outcomes and total EPDS score, were also explored. None of these

<table>
<thead>
<tr>
<th>Table I</th>
<th>Population Demographics</th>
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<tbody>
<tr>
<td>Demographic factor</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Age</td>
<td>26.8 (4.9)</td>
</tr>
<tr>
<td>Weeks postpartum</td>
<td>6.1 (0.7)</td>
</tr>
<tr>
<td>Gestational age at delivery</td>
<td>38.4 (2.6)</td>
</tr>
<tr>
<td>Birth weight (kg)</td>
<td>3.4 (0.6)</td>
</tr>
<tr>
<td>No. of children</td>
<td>1.7 (0.9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table II</th>
<th>Screening Results for Questions Not Part of the EPDS</th>
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<tbody>
<tr>
<td>Question</td>
<td>No. who answered the question</td>
</tr>
<tr>
<td>Spouse deployed at time of appointment</td>
<td>410</td>
</tr>
<tr>
<td>Spouse deployed during pregnancy</td>
<td>411</td>
</tr>
<tr>
<td>Personal history of depression</td>
<td>413</td>
</tr>
<tr>
<td>History of taking medication for depression</td>
<td>413</td>
</tr>
<tr>
<td>Feel isolated</td>
<td>403</td>
</tr>
</tbody>
</table>

Figure 1  EPDS score and percent positive screen by deployment status.
relationships were found to be statistically significant.

A linear regression model was calculated to significantly \((p < 0.001)\) predict score on the EPDS from the available information. Adjusted \(R^2\) for the model was 0.274, indicating that 27.4\% of the variance in EPDS was accounted for. Factors that were found to be statistically significant in the model were isolation, history of depression and history of deployment. The \(β\) for standardized coefficients \((p\) values\) was 0.367 \((< 0.001)\), 0.254 \((< 0.001)\) and 0.131 \((0.003)\), respectively. History of being on antidepressants, age and spousal deployment at the time of the postpartum visit were not found to significantly contribute \((p > 0.1)\).

**Discussion**

This is the first study to directly assess the importance of spousal deployment during pregnancy and postpartum as a risk factor for symptoms of depression. Given that poor social support and recent life stressors are well established as risk factors for PPD, spousal deployment also seemed likely to be important in this disease. The importance of the question posed by this study is underscored by the current tempo of military deployments, in which service members are likely to spend significant amounts of time overseas without their spouses.

This study demonstrated that having a spouse who deployed during pregnancy is a risk factor for having a positive postpartum depression screen. This risk continued to show a significant effect on scores for depression even when accounting for other variables, such as feelings of isolation or past depressive history. This suggests that the stress of deployment is multifactorial and that providing greater social support will not fully attenuate the effects of deployment. Indeed, the fact that only 7\% of study patients responded that they felt socially isolated suggests that the military is currently managing the risk factor of isolation well. Of interest, although depression scores for patients whose spouses were deployed at the time of the screening had a trend in the same direction as those with spouses who deployed during the pregnancy, the trend did not reach the statistical significance attained by the latter group. This may have been an artifact of the fact that more spouses were brought back for delivery and thus our \(n\) for mothers with spouses deployed during screening was lower. We also did not collect information on the length of deployments, so it is possible that those mothers who reported that the father was gone during the screening process may have been responding to a shorter period of absence. Either a study with greater power or one that investigated length of deployment would be needed to investigate this question further.

Several factors lend credence to the findings of this study. The patients were drawn from diverse practice settings, including regular obstetrics, complicated obstetrics and midwife practices and hospital-based as well as community clinics. The fact that results from the 6-week postpartum visit were used prevented patients from having positive screens as the result of postpartum blues. The screening instrument used is well studied and clearly validated. Thus a sufficiently large group of patients was screened at an appropriate time with an appropriate instrument. Furthermore, the results of the study are logical and consistent with former studies.

However, the study did have several weaknesses. Perhaps the greatest limitation is that although the EPDS is an effective screening tool, it is not sufficient to establish a diagnosis of PPD. Thus, although we can comment on the presence of depressive symptoms and rates of positive screens, we cannot generalize that data to rates of PPD. This would require that positive screens be followed with a formal clinical interview. Second, some patients may have developed depression earlier than 6 weeks postpartum and been treated for it or may have developed depression later than 6 weeks postpartum. Both of these factors may have affected the total percentage of women diagnosed with PPD. However, it is likely that the error resulting from these problems would be distributed approximately evenly across the various groups. Another weakness is the fact that the screening form included specific questions about spousal deployment. Although this potentially could have created a recall bias, one would expect that such a bias would be stronger among women whose spouses were currently deployed. One weakness that this study shares with all nonrandomized trials is that it cannot show causality. There may be some other factor that puts women at higher risk for PPD and their spouses at higher risk for deployment.

The overall result of this study, that deployment during pregnancy seems to increase depressive symptoms and positive screening for PPD, is important for several reasons. First, it supports the idea that the screening program in place for these mothers is useful because they are a high-risk
group. Using a screening tool such as the one studied here, which included both the EPDS and other risk factors such as history of depression and sense of isolation, would also be appropriate earlier in the obstetric course to provide information on existence of depressive symptoms and risk for later developing PPD. Second, it should raise awareness in other providers who care for active-duty members and their spouses and possibly encourage the establishment of similar programs. Third, it should encourage education of patients concerning risks for PPD so those at risk may themselves seek out care when needed.

The findings of this study invite research into several related questions. To what degree is the location of deployment important? Is the effect stronger when the spouse is deployed to a combat zone? What is the effect of deployments of differing lengths? Can these results be generalized to individuals whose spouses leave for nonmilitary jobs? It also will be important to examine what factors contribute to PPD in the cohort of active-duty women who become pregnant. Are there factors in military life that contribute to postpartum depression? In addition to answering new questions, additional research could strengthen the findings presented here. Although randomization to deployment is impractical, a prospective study could track the time course of depressive symptoms relating to both obstetric status and deployment. Adding the results of diagnostic interviews to the study would allow researchers to describe changes in depressive symptoms and screening status. Finding answers to these questions will help us to further understand, better screen for, and ultimately treat in a more timely manner this common and often debilitating disorder.

References