

SEXUAL DYSFUNCTION IN COMBAT VETERANS WITH POST-TRAUMATIC STRESS DISORDER

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ABSTRACT

Objectives. To evaluate the prevalence, clinical correlates, and severity of sexual dysfunction in combat veterans with and without post-traumatic stress disorder (PTSD) using a validated instrument for assessing sexual function. The results of recent studies have suggested that combat veterans with PTSD experience a higher rate of sexual dysfunction than do those without PTSD.

Methods. We administered the International Index of Erectile Function (IIEF) and a demographic and health questionnaire to male combat veterans undergoing treatment for PTSD and to age-comparable male combat veterans without PTSD.

Results. The mean total IIEF score was significantly lower in the 44 patients with PTSD than in the 46 controls (26.38 versus 40.86; $P = 0.035$). With respect to the individual IIEF domains, patients with PTSD had poorer scores on overall satisfaction and orgasmic function and showed trends toward poorer scores on intercourse satisfaction and erectile function. No statistically significant difference was observed for sexual desire. The rate of erectile dysfunction was 85% in patients with PTSD and 22% in controls. Moderate to severe erectile dysfunction was present in 45% of the patients with PTSD and in only 13% of controls. Significantly more patients with PTSD (57%) than controls (17%) were using psychotropic medications.

Conclusions. Combat veterans with PTSD experience a significantly higher rate of sexual dysfunction than do veterans without PTSD and show impairment in some, but not all, specific domains of sexual function. The IIEF may be useful in evaluating the response to treatment of erectile dysfunction. Clinicians should proactively address the sexual concerns of combat veterans with PTSD. UROLOGY 60: 881–884, 2002. © 2002, Elsevier Science Inc.

Post-traumatic stress disorder (PTSD) is a psychiatric disorder describing the long-lasting symptoms that can occur after exposure to extremely stressful life events. It is estimated that 3.6% of American adults aged 18 to 54 years have PTSD and that about 30% of Vietnam veterans developed PTSD during, or at some point after, the Vietnam war.¹ More recently, PTSD has been detected among as many as 8% of Gulf War veterans.²

It has been well-documented that PTSD significantly affects emotional, social, and professional functioning.³ It also affects physical health and health-related quality of life.^{4–7} The results of recent studies have suggested increased rates of sexual problems among patients with PTSD.^{8,9} Vietnam combat veterans meeting the criteria for PTSD were more likely to report problems with “sexual disinterest” than were subjects without PTSD.¹⁰ Eighty percent of patients admitted to a PTSD rehabilitation ward reported premature ejaculation or failure to achieve or maintain an erection.¹¹ Similarly, other investigators have reported that more than 80% of combat veterans with PTSD experience clinically relevant sexual difficulties and 69% have erectile problems.¹² In this study, we evaluated the prevalence and clinical correlates of sexual dysfunction among combat veterans with PTSD using the International Index of Erectile Function (IIEF), a validated instrument for the assessment of erectile function.

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TABLE I. Patient characteristics

Characteristic	PTSD Patients (n = 44)	Control Patients (n = 46)	P Value
Mean age (yr)	51 (30–60)	52 (30–78)	NS
Sexual partner (%)	50	63	NS
Hypertension (%)	43	43	NS
Diabetes (%)	14	11	NS
Coronary artery disease (%)	14	17	NS
Smoke (%)	77	78	NS
Psychotropics (%)	57	17	<0.05

KEY: PTSD = post-traumatic stress disorder; NS = not significant.

MATERIAL AND METHODS

SUBJECTS

Male combat veterans who were receiving treatment for combat-related PTSD at the outpatient Veterans Affairs Medical Center PTSD clinic were asked to participate in the study. All patients met DSM-IV criteria for PTSD on the basis of a clinical diagnostic interview conducted by an experienced clinician.

A control group of age-comparable male combat veterans without PTSD was obtained by interviewing male patients receiving outpatient general medical or surgical care at the same outpatient Veterans Affairs Medical Center medical facility or at the Veterans Affairs Hospital. The patient characteristics, including number of patients, age, partner status, and medical comorbidities, are presented in Table I.

INSTRUMENTS

The Institutional Review Boards of the Veterans Affairs, San Diego, Healthcare System and the University of California, San Diego, Human Subjects Committee approved the study. After the interviewer gave an explanation of the nature of the study, participants provided informed consent and were asked to complete a packet of questionnaires at a scheduled clinic visit. The packet included a demographic and health questionnaire and the IIEF.¹³ All five IIEF domains were scored for each responder. Combat exposure and PTSD status were assessed by two self-report measures, the Posttraumatic Stress Disorder Checklist² and the Combat Exposure Scale.¹⁴

Self-administered questionnaires are frequently used tools in validation studies to measure sexual function. The IIEF is a 15-item instrument used to assess sexual function in five domains—erectile function (EF), orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. Average scores are calculated in each of the major domains, and a severity algorithm is available for clinical interpretation of the scores.¹³ Psychometric validation has demonstrated a high degree of reliability (internal consistency and test-retest reliability) in both clinical and nonclinical samples. The sensitivity and specificity (treatment responsiveness) are excellent. The IIEF is available in 23 languages and is currently in use in several large-scale multinational trials. The major advantages of the IIEF are its relative brevity and ease of use, its inclusion of multiple domains of sexual function, and its strong psychometric profile.¹⁵

The EF domain was used to quantify the degree and presence of erectile dysfunction (ED), as suggested by Cappelleri *et al.*¹⁶ EF domain scores of 6 to 25 indicate the presence of ED, and EF domain scores of 26 to 30 indicate no ED. Furthermore, a score of 6 to 10 is indicative of severe ED, 11 to 16 suggests moderate ED, 17 to 21 indicates mild to moderate ED, and 22 to 25 indicates mild ED.¹⁶

STATISTICAL ANALYSIS

The patient-reported characteristics in the two study groups were compared using the chi-square test (Table I). A statistically significant difference was found in the use of psychotropic medications among patients with PTSD compared with the control patients ($P < 0.05$). We therefore used analysis of covariance with psychotropic medication use (dichotomously classified as present or absent) as a covariable to make comparisons between the two groups.

RESULTS

Ninety combat veterans (44 patients with PTSD and 46 controls) completed the questionnaire survey. The mean age was 51 years in the PTSD group and 52 years in the control group ($P > 0.05$). No statistically significant differences in history of smoking, hypertension, diabetes, coronary artery disease, or other potential comorbidities were noted between the two groups (Table I). More patients with PTSD than controls were using psychotropic medications (57% versus 17%, $P < 0.05$).

Table II summarizes the IIEF results. Compared with the controls, the mean scores of the patients with PTSD were lower for the total IIEF. With respect to the individual IIEF domains, patients with PTSD had poorer scores on overall satisfaction and orgasmic function and showed trends toward poorer scores on intercourse satisfaction and EF. No statistically significant difference in sexual desire was observed.

By using the EF domain to characterize the prevalence and severity of ED, we found that among our patients with PTSD, 85% had ED compared with only 22% of our control group ($P < 0.05$). Forty-five percent of the patients with PTSD had moderate to severe ED compared with only 13% of the controls ($P = 0.023$).

The severity of PTSD as quantified by the Posttraumatic Stress Disorder Checklist correlated significantly with the total IIEF scores ($P < 0.001$) and the EF ($P < 0.001$), orgasmic function ($P = 0.001$), sexual desire ($P = 0.025$), intercourse satisfaction ($P < 0.001$), and overall satisfaction ($P < 0.001$) domains. A trend toward a correlation

TABLE II. IIEF scores

Domain	PTSD Patients (n = 44)	Control Patients (n = 46)	P Value
Overall satisfaction	4.17	6.65	0.004
Intercourse satisfaction	3.12	5.71	0.085
Orgasmic function	2.9	5.03	0.044
Erectile function	9.9	15.88	0.097
Sexual desire	5.81	5.85	0.803
Total IIEF score	26.38	40.86	0.035

KEY: IIEF = International Index of Erectile Function; PTSD = post-traumatic stress disorder.

between the severity of combat exposure, as measured by the Combat Exposure Scale, and EF ($P = 0.06$) and orgasmic function ($P = 0.06$) domains was also noted.

COMMENT

PTSD has been found to affect emotional, social, and professional functioning, as well as physical health, significantly. Sexual dysfunction has previously been identified among patients with PTSD. We have confirmed this finding compared with an age-comparable group of combat veterans and did so using a validated instrument for the evaluation of sexual dysfunction, the IIEF. Moreover, we demonstrated that specific domains of sexual function (eg, orgasmic function) are impaired in PTSD and others (eg, sexual desire) are unimpaired. We found statistically significant impairment of the specific domains of orgasmic function and overall satisfaction in patients with PTSD and a trend toward significant impairment in the domains of EF and intercourse satisfaction; however, sexual desire was not impaired. We speculate that a larger sample size might demonstrate statistical significance in the EF and intercourse satisfaction domains.

Various explanations for sexual dysfunction among patients with PTSD have been suggested. On a psychosocial level, it has been suggested that PTSD may serve as a moderating variable in the relationship between an initial trauma and later sexual problems. Patients with PTSD may have blunted affect and diminished responsiveness to sexual situations. Furthermore, sexual activity may induce the revival of traumatic memories.¹² We looked at the severity of PTSD with the Post-traumatic Stress Disorder Checklist and found that these scores correlated highly with the severity of sexual dysfunction and impairment of all individual sexual domains.

Although access to fewer partners for patients with PTSD has been suggested as another possible explanation,¹² we found no statistically significant differences between our patients with PTSD and

our control patients with respect to access to partners (Table I).

Coexistent medical and psychological problems can also contribute to sexual problems both in the general population and in the patient with PTSD. Kotler *et al.*¹⁷ suggest that PTSD may be a "heterogeneous syndrome" with a high rate of medical and psychiatric comorbidities that may account for sexual dysfunction in these patients. Certain cardiovascular, gastrointestinal, and musculoskeletal problems are known to affect patients with PTSD more than the general population.¹⁸ In our analysis, however, we found no difference between our patients with PTSD and controls in the incidence of hypertension, diabetes, coronary artery disease, or smoking history.

Vietnam combat veterans are significantly more likely to meet the criteria for alcohol abuse, alcohol dependence, and depression.¹ These disorders have been linked to male sexual disorders, including premature ejaculation and inhibited sexual desire.¹⁹ In this study, we found no differences in the history of alcohol abuse or dependence between the study and control groups to justify a covariance analysis for this parameter.

Antidepressant drugs, especially the selective serotonin reuptake inhibitors (SSRIs), are frequently associated with delayed ejaculation and anorgasmia and may interfere with sexual desire and satisfaction.^{20–24} Kotler *et al.*¹⁷ recently concluded that the pervasive sexual dysfunction in patients with PTSD is exacerbated by treatment with SSRIs. In our study, we found that 57% of our patients with PTSD were using some form of psychotropic medication compared with only 17% of the control patients. This difference was statistically significant, and we attempted to account for this by using analysis of covariance with psychotropic medications as a covariate. We categorized people as taking a psychotropic medication or not and as such did not have a breakdown of the classes of medications used. However, we know that in our PTSD clinics, the medications commonly prescribed include SSRIs and benzodiazepines. It is possible that SSRI

use by our patients with PTSD may result in a delay in ejaculation, which could account for the poorer scores with respect to the orgasmic function domain of the IIEF. The impairment of orgasmic function, combined with poorer erectile function, likely accounts for the drop in the overall satisfaction domain seen for patients with PTSD. Because sexual desire did not change, this impairment represents a major health issue that deserves addressing by the PTSD practitioner. We believe that physicians may want to be judicious in prescribing psychotropic agents and consider other medications besides SSRIs in patients with PTSD.

Sexual dysfunction in men with PTSD may also represent a systemic imbalance of the sympathetic nervous system. Men with PTSD have been demonstrated to have higher than normal plasma and urinary catecholamine levels.^{25,26} The evaluation of corporal catecholamine levels in the flaccid and erect state may help delineate the neurophysiology of sexual dysfunction in PTSD.

CONCLUSIONS

We evaluated the prevalence, clinical correlates, and severity of sexual dysfunction among combat veterans with PTSD using the IIEF and compared the results with those from an age-comparable group of combat veterans without PTSD. Using the IIEF, we clearly demonstrated the pervasive sexual dysfunction experienced by this patient group. As we learn more about the neurophysiology of PTSD as it relates to ED, the IIEF may be useful in studies to evaluate the response to treatment. In the interim, healthcare providers participating in the care of men with PTSD should be encouraged to address the sexual concerns of these patients in a proactive manner.

REFERENCES

1. Health status of Vietnam veterans. II. Physical Health. Centers for Disease Control, Vietnam Experience Study. *JAMA* 259: 2708–2714, 1988.
2. Weathers FW, Litz BT, Huska JA, *et al*: *PCL-C for DSM-IV*. Boston, National Center for PTSD, Behavioral Sciences Division, 1994.
3. Zatzick DF, Marmar CR, Weiss DS, *et al*: Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *Am J Psychiatry* 154: 1690–1695, 1997.
4. Beckham JC, Moore SD, Feldman ME, *et al*: Health status, somatization, and severity of posttraumatic stress disorder in Vietnam combat veterans with posttraumatic stress disorder. *Am J Psychiatry* 155: 1565–1569, 1998.
5. Taft CT, Stern AS, King LA, *et al*: Modeling physical health and functional health status: the role of combat exposure, posttraumatic stress disorder, and personal resource attributes. *J Trauma Stress* 12: 3–23, 1999.
6. Mendlowicz MV, and Stein MB: Quality of life in individuals with anxiety disorders. *Am J Psychiatry* 157: 669–682, 2000.
7. Wagner AW, Wolfe J, Rotnitsky A, *et al*: An investigation of the impact of posttraumatic stress disorder on physical health. *J Trauma Stress* 13: 41–55, 2000.
8. Kaplan HS: Anxiety and sexual dysfunction. *J Clin Psychiatry* 49(suppl): 21–25, 1988.
9. Kaplan HS: Post-traumatic stress syndrome and sexual dysfunction. *J Sex Marital Ther* 15: 74–77, 1989.
10. Litz BT, Keane TM, Fisher L, *et al*: Physical health complaints in combat-related post-traumatic stress disorder: a preliminary report. *J Trauma Stress* 5: 131–141, 1992.
11. Solursh LP, and Solursh DS: Male erectile disorders in Vietnam combat veterans with chronic post-traumatic stress disorder. Special Issue. Sexuality and disability in adolescence and beyond. *Int J Adolescent Med Health* 7: 119–124, 1994.
12. Letourneau EJ, Schewe PA, and Frueh BC: Preliminary evaluation of sexual problems in combat veterans with PTSD. *J Trauma Stress* 10: 125–132, 1997.
13. Rosen RC, Riley A, Wagner G, *et al*: The International Index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile dysfunction. *Urology* 49: 822–830, 1997.
14. Keane TM, Fairbank JA, Caddell JM, *et al*: Clinical evaluation of a measure to assess combat exposure. *Psychol Assess* 1: 53–55, 1989.
15. Rosen RC: Design and methodology of clinical trials of erectile dysfunction, in Carson CC III, Kirby RS, and Goldstein I (Eds): *Textbook of Erectile Dysfunction*. Oxford, Isis Medical Media, 1999, pp 171–181.
16. Cappelleri JC, Rosen RC, Smith MD, *et al*: Diagnostic evaluation of the erectile function domain of the International Index of Erectile Function. *Urology* 54: 346–351, 1999.
17. Kotler M, Cohen H, Aizenberg D, *et al*: Sexual dysfunction in male posttraumatic stress disorder patients. *Psychother Psychosom* 69: 309–315, 2000.
18. Schnurr PP, Spiro A, III, and Paris AH: Physician-diagnosed medical disorders in relation to PTSD symptoms in older male military veterans. *Health Psychol* 19: 91–97, 2000.
19. Fagan PJ, Schmidt CW, Wise TN, *et al*: Sexual dysfunction and dual psychiatric diagnoses. *Compr Psychiatry* 29: 278–284, 1988.
20. Harvey KV, and Balon R: Clinical implications of antidepressant drug effects on sexual function. *Ann Clin Psychiatry* 7: 189–201, 1995.
21. Gitlin MJ: Psychotropic medications and their effects on sexual function: diagnosis, biology and treatment approaches. *J Clin Psychiatry* 55: 406–413, 1994.
22. Lane RM: A critical review of selective serotonin reuptake inhibitor-related sexual dysfunction: incidence, possible etiology and implications for management. *J Psychopharmacol* 11: 72–82, 1997.
23. Segraves RT: Effects of psychotropic drugs on human erection and ejaculation. *Arch Gen Psychiatry* 46: 275–284, 1989.
24. Herman JB, Brotman AW, Pollack MH, *et al*: Fluoxetine induced sexual dysfunction. *J Clin Psychiatry* 51: 25–27, 1990.
25. Liberzon I, Abelson JL, Flagel SB, *et al*: Neuroendocrine and psychophysiological responses in PTSD: a symptom provocation study. *Neuropsychopharmacology* 21: 40–50, 1999.
26. Yehuda R, Southwick S, Giller EL, *et al*: Urinary catecholamine excretion and severity of PTSD symptoms in Vietnam combat veterans. *J Nerv Mental Dis* 180: 321–325, 1992.