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A Naturalistic Prospective Open Study of the Effects of Adjunctive Therapy of Sexual Dysfunction in Chronic PTSD Patients

Bela Chudakov, MD, Hagit Cohen, PhD, Michael Alex Matar, MD, and Zeev Kaplan, MD

Ministry of Health, Mental Health Center, Faculty of Health Sciences, Anxiety and Stress Research Unit, Ben-Gurion University of the Negev, Beersheba, Israel

Abstract: Introduction: Post-traumatic Stress Disorder (PTSD) symptoms cause dysfunction in broad areas of patients' lives and those of their families. Sexual dysfunction (SD) is common in these patients and aggravates their distress, affecting overall sexual activity, desire, arousal, orgasm, activity and satisfaction. PTSD clinic patients are frequently referred for consultation and treatment in the SD clinic. This prospective naturalistic follow-up study of a random group of patients was intended to evaluate response to pharmacologic and psychotherapeutic interventions for SD, in terms of both sexual functioning and overall symptomatology. *Methods:* Ten patients fulfilling DSM-IV diagnostic criteria for PTSD (one woman and nine men) were recruited. Treatment for the sexual symptoms was tailored individually and was administered in addition to the continuing (stable) treatment in the PTSD clinic. *Results:* After two months of treatment for the sexual symptoms, statistically significant improvements in all domains of sexual functioning were observed. In parallel, statistically significant improvements in all domains of the Impact of Events Scale scores were observed, both on the avoidance and intrusive subscales. There were no significant differences in response to treatment in terms of time elapsed since the onset of PTSD, or the pattern or severity of sexual and PTSD symptoms. *Conclusions:* The results of this modest study demonstrate the importance of relating to the SD of PTSD patients irrespective of the duration or severity of their disorder. In this mixed group of PTSD patients with varied duration of symptoms, both SD and PTSD core symptoms improved significantly in response to individually tailored adjunctive treatment of the SD.

Introduction

Post-traumatic stress disorder (PTSD) is a chronic syndrome reflecting a disorder of cognitive, emotional and physiological processing and/or recovery from the initial reaction to exposure to a potentially traumatic experience (PTE). The diagnosis rests upon three clusters of symptoms, a specified number of which must be present over a period of at least one month: 1) intrusive re-experiencing of the traumatic event in the form of nightmares and flashbacks, with an exaggerated response to cues; 2) persistent avoidance of stimuli associated with the trauma and a numbing of emotions; and 3) persistent symptoms of arousal and vigilance — an exaggerated startle response, increased physiological arousal and sustained preparedness for an instant alarm response (1).

The estimated lifetime prevalence of PTSD among adult Americans is 7.8%, with women (10.4%) twice as likely as men (5%) to have PTSD at some point in their lives. This represents a small portion of those who have experienced at least one traumatic event; 60.7% of men and 51.2% of women reported at least one traumatic event (2–6). In Israel, despite the ongoing terrorist attacks, the prevalence rate of PTSD is around 9–10% (7, 8).

Characteristically, PTSD leads to emotional, social and professional dysfunction, and deeply affects interpersonal, marital and sexual spheres. Although most therapists are aware of the SD accompanying PTSD, research has been sparse. Kaplan (9, 10) has shown that sexual problems are prevalent among PTSD patients. Letourneau et al. (11) reported that over 80% of PTSD patients studied were experiencing clinically relevant sexual difficulties. Impotence

Address for Correspondence: Hagit Cohen, PhD, Anxiety and Stress Research Unit, Ministry of Health, Mental Health Center, Faculty of Health Sciences, Ben-Gurion University of the Negev, POB 4600, Beersheba 84170, Israel.
E-mail: hagitc@bgu.ac.il

and premature ejaculation were the most frequently reported problems.

A previous study demonstrated that PTSD is associated with poor sexual functioning in multiple domains: desire, arousal, orgasm, activity and satisfaction (12). Moreover, selective serotonin receptor inhibition (SSRI) treatment aggravated the SD compared to an untreated group (12). As the years pass, so the severity of the dysfunction in various areas of life often deepens and becomes more resistant to change.

Increasing awareness of the importance of SD in a variety of mental disorders has led to frequent cross-referrals of PTSD clinic patients to the SD clinic for consultation and treatment. Although both patients and staff have generally been satisfied with the results of these referrals, the value of the procedure needed to be assessed more objectively, especially in light of an unproven sense that the improvement extends beyond the bounds of the SD, per se.

The aim of this study was to evaluate the effectiveness of adjunctive pharmacological and psychotherapeutic treatments for SD in a naturalistic prospective open follow-up study of a random group of patients suffering from PTSD of varying severity and duration referred to the SD clinic.

Methods

Subjects

Ten patients fulfilling DSM-IV diagnostic criteria for PTSD, as assessed by the Structured Clinical Interview for DSM (SCID), and on stable medication regimens, referred by the PTSD outpatient clinic staff for consultation in the SD clinic at the Beersheba Mental Health Center (one woman and nine men), were recruited into this naturalistic prospective follow-up study. Treatment for the sexual symptoms was tailored individually and was administered in addition to the continuing treatment in the PTSD clinic (13, 14). The original medication regimen was maintained unchanged.

Since SD commonly accompanies many chronic medical conditions and their treatment, patients with a history of any chronic medical conditions, substance abuse, neurosurgery or traumatic brain injury were excluded from the study. Conversely, we chose to disregard type of trauma, time elapsed since onset and severity/pattern of PTSD or SD, with the intent to study a representative group of patients.

After receiving a full explanation of the procedures, all subjects signed a written informed consent approved by the Helsinki Ethics Committee of Ben-Gurion University.

The subject group consisted of nine men and one woman, with a mean age of 45.6 (±S.D 7.3) years, range 30–53. Type of trauma included combat (N=3), POW (N=1), motor vehicle accident (N=2) and work accident (N=4). Mean time elapsed since trauma was 15.2 (±S.D 14.8) years, range 1–32 years. One subject was medication-free, but most were receiving at least one medication in a regimen which had been stable for least three months and was maintained stable throughout the trial period (Table 1).

Sexual therapy

Three modalities were applied in individually tailored regimens to individuals or couples and were performed by one person (B.C.).

(a) **Sex therapy**: Short-term behavioral treatment aimed to modify the dysfunctional behavior as directly as possible. The particular approaches target self-defeating beliefs and attitudes; teach sexual skills; enhance sexual knowledge; improve sexual communication; and reduce performance anxiety. Granting people "permission" to sexually experiment or discuss negative attitudes about sex helps to overcome sexual problems without the need for more intensive therapy (13).

(b) **Sensate focus exercises** (14): Exercises in which sex partners take turns giving or receiving pleasurable stimulation in nongenital areas of the body.

(c) **Psychosexual therapy** (15): Combined behavioral and psychotherapy methods, focusing on improving the couple's communication, eliminating performance anxiety, and fostering sexual skills and knowledge, with brief insight-oriented therapy when it appears that remote causes impede response to the behavioral program.

Table 1. *Demographic data and clinic characteristic of patients*

	Gender	Age	Marital Status	Employ-ment	Type of trauma	Time elapse since trauma (years)	PTSD Treatment (mg/day)	Sexual problems	SD Treatments
1	M	53	MR	UE	Combat reaction	32	None	Erectile dys-function	Sildenafil 100 mg
2	M	40	MR	UE	Motor vehicle accident	1	Cipramil 40 Nocturno 7.5	Erectile dys-function	Sildenafil 100 mg + sexual family therapy
3	M	52	D	UE	Combat reaction	32	Prozac 60 Clonex 0.5	Erectile dys-function	Vardenafil 10 mg + sup-port therapy
4	M	50	MR	UE	Combat reaction	32	Remeron 45 Xanax 0.5	Erectile dys-function	Sildenafil 100 mg + sup-port therapy
5	M	48	MR	UE	Work accident	3	Cipramil 40 Tegretol 600	Erectile dys-function	Tadalafil 20 mg
6	F	49	MR	UE	Motor vehicle accident	3	Cipramil 60 Bondormine 0.25	Lack of sex-ual desire	1% testosterone gel + sex-ual family therapy
7	M	30	MR	UE	Work accident	2	Nocturno 7.5	Erectile dys-function	Tadalafil 20 mg + "Sensate Focus" treatment
8	M	39	MR	UE	Work accident	3	Seroxat 40 Clonex 0.5	Erectile dys-function	Tadalafil 20 mg
9	M	51	MR	E	Combat reaction (POW)	32	Cipralex 20	Erectile dys-function	Tadalafil 20 mg
10	M	44	MR	UE	Work accident	12	Etumine 80 Tegretol 400 Valium 10	Erectile dys-function + Lack of sex-ual desire	Tadalafil 20 mg + 1% tes-tosterone gel + "Sensate Focus" treatment

M = Male, F = Female, MR = Married, D = Divorced, UE =Unemployed, E= Employed,

Scales

Demographics and Background Questionnaire: Participants were asked to answer questions regarding their personal background, demographic data, marital status, place of birth, education, and the timing and type of trauma that led the person to seek help.

Rating Scales: PTSD symptoms and sexual functioning were rated by the same investigator (B.C.). The patients were assessed at two time points — before interventions for SDs (baseline) and at least two months after the intervention. Questionnaires were filled out in the presence of the interviewer and subjects were assisted in answering the questions, if needed. The interviewer made sure that all subjects clearly understood the content of each item.

The following instruments were used:

Arizona Sexual Experience (ASEX) Scale (16): A sexual functioning questionnaire derived from the Guided Interview Questionnaire for females and males and from the Arizona Sexual Experience Scale (16). The questionnaire includes five items with a score ranging from 1 to 6 (1 = greater than normal; 2 = normal; 3 = minimally diminished; 4 = moderately diminished; 5 = markedly diminished; and

6 = totally absent). A total score (the sum of the scores of items 1–5) is used as a global measure of SD.

The Impact of Event Scale (IES) (17): A self-report scale with two subscales, "intrusion" and "avoidance." Seven of the items reflect the presence of intrusive thoughts, images, feelings or dreams of the event, and the other eight items reflect the tendency to deny, repress or avoid memories or situations related to the trauma. The IES has been validated in Hebrew on Israeli combat veterans by Schwarzwald et al. (18).

Statistical analysis: Comparisons on dimensions of sexual functioning were done using simple factorial analysis of variance, with age as a covariate (ANCOVA) for continuous variables and logistic regression for dichotomous variables. Age was controlled for, as studies have shown that age is significantly correlated with sexual functioning (19). This was confirmed in preliminary analysis of this data set which revealed that most correlations between age and domains of sexual functioning were significant and ranged from r=0.38 to r=0.60.

Results

Table 2 compares the domains of sexual functioning and PTSD symptoms before and after treatment for SD — controlling for age differences. Sexual functioning was significantly impaired at baseline as reflected by high scores. At baseline (before treatment) the data confirm significant SD in the PTSD patient population as demonstrated by low mean sexual drive, sexual arousal, erectile function, orgasm, sexual satisfaction and the total ASEX scale (Figure 1).

Table 2. *Questionnaire scores before and after treatment*

Scales	Before treatment (N=10) Mean (Std. Dev)	After treatment (N=10) Mean (Std. Dev)	ANOVA
Arizona Sexual Experience Scale:			
Sexual drive	5.6 (0.52)	3.0 (0.7)	F(1,18)=95.1, p<0.0001
Sexual arousal	5.1 (0.6)	3.1 (0.6)	F(1,18)=62.1, p<0.0001
Erectile function / vagina wet	4.7 (0.7)	2.5 (0.7)	F(1,18)=50.6, p<0.0001
Orgasm	5.1 (0.7)	2.8 (0.8)	F(1,18)=45.3, p<0.0001
Sexual satisfaction	5.1 (1.0)	2.5 (0.5)	F(1,18)=53.4, p<0.0001
Total score	25.6 (2.1)	13.9 (2.0)	F(1,18)=163.6, p<0.0001
Impact of Event Scale:			
Avoidance	27.9 (4.4)	14.3 (5.6)	F(1,18)=36.9, p<0.0001
Intrusive	27.6 (4.9)	12.4 (5.2)	F(1,18)=45.5, p<0.0001
Total score	52.5 (9.6)	26.7 (8.9)	F(1,18)=38.6, p<0.0001

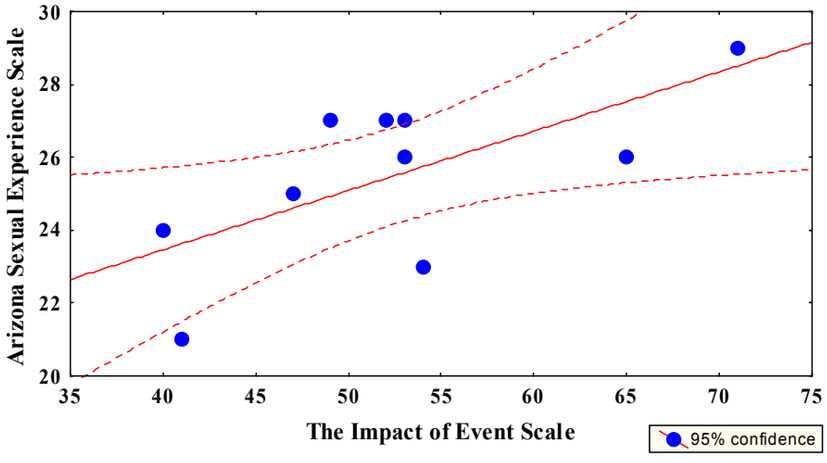

Figure 1: Linear correlation between PTSD total symptoms (according the IES) and the sexual functioning total score.

After two months of treatment, the results indicate statistically significant improvements in the subscales for sex drive ($F[1,18]=95.1$, $p<0.0001$), sexual arousal ($F[1,18]=62.1$, $p<0.0001$), erectile function ($F[1,18]=50.6$, $p<0.0001$), orgasm ($F[1,18]=45.3$, $p<0.0001$), sexual satisfaction ($F[1,18]=53.4$, $p<0.0001$) and the total ASEX scale ($F[1,18]=163.6$, $p<0.0001$) as compared to baseline measures.

The PTSD symptom profiles before and after treatment of the SD using the IES scale (Table 2) demonstrated statistically significant improvements in total IES scores ($F[(1,18]=38.6$, $p<0.0001$), and in the subscales for avoidance ($F[1,18]=36.9$, $p<0.0001$) and intrusive symptoms ($F[1,18]=45.5$, $p<0.0001$).

There were no significant correlations between severity of either sexual or PTSD symptom parameters and time elapsed since the onset of PTSD.

Correlation of sexual functioning and symptoms

The correlation between sexual functioning and IES scales was computed. Before treatment there were significant correlations between sexual functioning and the total IES score ($r=0.67$, $df=1, 8$, $P<0.001$). After treatment, no significant correlations between sexual functioning and IES scores were found.

Side effects

Pharmacological interventions for the SDs (Sildenafil, Vardenafil, Tadalafil) were well tolerated and no serious adverse effects were reported by any of the patients.

Discussion

The findings of this naturalistic prospective follow-up study demonstrate that adjunctive oral pharmacological and specifically tailored psychotherapeutic (individual and/or couples) treatment of SD in PTSD patients resulted in improved sexual function, irrespective of severity or duration of the PTSD, or of the pre-existing treatment regimen. Moreover, the improvement in SD symptoms was accompanied by significantly reduced scores on both the intrusive and avoidance subscales of the IES, resulting in overall reduction in IES scores. This improvement held true for the single woman as well as all the men in the study group.

At baseline, the population recruited into this follow-up study demonstrated significant association between severity of PTSD and of SD. Our findings corroborate the results of the study by Reznik et al. (20), which evaluated the impact of treatment of oral Sildenafil citrate (50 mg/day for four weeks) to ongoing anti-depressant treatment regimens in male PTSD patients. The results demonstrated a statistically significant improvement in erectile function (53.5%), orgasmic function (40.3%), sexual desire (53%), intercourse satisfaction (82%) and overall satisfaction (57.4%). Concomitantly, a significant improvement was seen in Clinician-Administered PTSD Scale scores, reflecting an improvement in PTSD core symptoms.

The improvement in sexual functioning in the present study was greater than the accompanying alteration in PTSD core symptoms and the correlation found at baseline was no longer found two months after sex therapy ended.

Clinically, PTSD is frequently associated with SD. The hyper-reactive autonomic nervous system (21, 22) and stress-hormones (23–28) may well contribute to this. One possible psychological mechanism for this effect may be the overall numbing of affective responsiveness and the limited range of affect often seen in patients with PTSD, and the predominance of negative affects. Patients with PTSD also have high rates of comorbid panic disorder, major depression and anxiety, all associated with SD. The families of PTSD patients, especially their partners, are severely affected by the patients' condition. Interpersonal relationships and the capacity for intimacy are commonly severely compromised.

Most of the PTSD patients in this study were receiving treatment with antidepressant agents (SSRI + SNRI), frequently associated with SD (29, 30). Clinical studies have shown that SSRI-treated patients report a significant decrease in desire, erectile dysfunction, delayed orgasm and decreased intensity of orgasm (30). In our previous study (12) we found that the pervasive SD in patients with PTSD is exacerbated by treatment with SSRIs. Thus, the dysfunctions observed in our population sample may at least in part have stemmed from side effects of their treatment.

The concomitant improvement in PTSD symptoms as reflected by the self-report scale used here (the IES) and in the physician-scored CAPS in other studies (20) may be related to a number of factors. Alleviation of this extremely troubling area of dysfunction will naturally lead to an improvement in the patients' self-image, self-confidence and interpersonal relationship with their partners, leading to an improvement in their general sense of well-being. Much of the avoidance and numbing seen in PTSD appears to be related to issues of loss of control, especially of affective-control, especially anger (31). The "controlled loss of control" involved in achieving sexual satisfaction may encourage a sense of mastery, which is the focus of many behavioral therapies for PTSD, such as prolonged exposure (32).

Although the study is modest, the results bring to light two important factors regarding the approach to the ongoing treatment of this often highly incapacitating disorder. Firstly, they emphasize the importance of relating to the SD of this chronic patient population, regardless of the duration or severity of symptoms, apparently in both men and women. Secondly, they indicate that larger-scale controlled prospective studies of the broader implications of sexual therapy in PTSD patients compared to other patient populations, such as Major Depression and Panic Disorder patients, are called for.

Limitations

a) The number of patients in the report is small.

b) The inclusion of only one woman in the study is unrepresentative and, although her positive response is encouraging, it can be regarded as no more than anecdotal until more data regarding SD in female PTSD patients can be collected, preferably with attention to type of trauma.

c) The open and uncontrolled nature of the study implies that the conclusions must be regarded as preliminary findings requiring confirmation in controlled studies.

Conclusions

PTSD patients can benefit from individually tailored adjunctive sexual therapy irrespective of duration or severity of their PTSD and demonstrate not only improved sexual function, but also significant improvement in PTSD core-symptoms on a self-report scale.

Physicians would do well to relate to their patients' complaints of SD at any point in the course of the disorders.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Washington, D.C.: American Psychiatric Association, 1994.
2. Breslau N, Davis GC, Andreski P, Peterson EL, Schultz LR. Sex differences in posttraumatic stress disorder. Arch Gen Psychiatry 1997;54:1044–1048.
3. Breslau N, Chilcoat HD, Kessler RC, Peterson EL, Lucia VC. Vulnerability to assaultive violence: Further specification of the sex difference in post-traumatic stress disorder. Psychol Med 1999;29:813–821.
4. Freedman SA, Gluck N, Tuval-Mashiach R, Brandes D, Peri T, Shalev AY. Gender differences in responses to traumatic events: A prospective study. J Trauma Stress 2002;15:407–413.
5. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52: 1048–1060.
6. Robin RW, Chester B, Rasmussen JK, Jaranson JM, Goldman D. Prevalence and characteristics of trauma and posttraumatic stress disorder in a southwestern American Indian community. Am J Psychiatry 1997; 154:1582–1588.
7. Bleich A, Gelkopf M, Solomon Z. Exposure to terrorism, stress-related mental health symptoms, and coping behaviors among a nationally representative sample in Israel. JAMA 2003;290:612–620.
8. Kaplan Z, Matar MA, Kamin R, Sadan T, Cohen H. Stress-related responses after 3 years of exposure to terror in Israel: Are ideological-religious factors associated with resilience? J Clin Psychiatry 2005;66:1146–1154.
9. Kaplan H. Anxiety and sexual dysfunction. J Clin Psychiatry 1988;49:21–25.
10. Kaplan H. Post-traumatic stress syndrome and sexual dysfunction. J Sex Marital Ther 1989;15:74–77.
11. Letourneau E, Schewe P, Frueh B. Preliminary evaluation of sexual problems in combat veterans with PTSD. J Trauma Stress 1997;10:125–132.
12. Kotler M, Cohen H, Aizenberg D, Marat M, Loewenthal U, Kaplan Z, Miodownik H, Zemishlany Z. Sexual dysfunction in male posttraumatic stress disorder patients. Psychother Psychosom 2000;69:309–315.

13. Singer-Kaplan H. The illustated manual of sex therapy. New York: Brunner Mazel, 1988.
14. Masters WH, Johnson VE. Human sexual inadequacy. Boston: Little & Brown, 1970.
15. Kaplan HS. The new sex therapy. Active treatment of sexual dysfunctions. New York: Brunner-Mazel, 1970.
16. McGahuey CA, Gelenberg AJ, Laukes CA, Moreno FA, Delgado PL, McKnight KM, Manber R. The Arizona Sexual Experience Scale (ASEX): Reliability and validity. J Sex Marital Ther 2000;26:25–40.
17. Horowitz M, Wilner N, Alvarez W. Impact of Event Scale: A measure of subjective stress. Psychosom Med 1979;41:209–218.
18. Schwarzwald J, Solomon Z, Weisenberg M, Mikulincer M. Validation of the Impact of Event Scale for psychological sequelae of combat. J Consult Clin Psychol 1987;55:251–256.
19. Kinsey AC, Pomeroy WB, Martin CE. Sexual behavior in the human male. Philadelphia: WB Saunders, 1948.
20. Reznik I, Zemishlany Z, Kotler M, Spivak B, Weizman A, Mester R. Sildenafil citrate for the sexual dysfunction in antidepressant-treated male patients with posttraumatic stress disorder. A preliminary pilot open-label study. Psychother Psychosom 2002;71:173–176.
21. Cohen H, Kotler M, Matar MA, Kaplan Z, Loewenthal U, Miodownik H, Cassuto Y. Analysis of heart rate variability in posttraumatic stress disorder patients in response to a trauma-related reminder. Biol Psychiatry 1998;44:1054–1059.
22. Cohen H, Kotler M, Matar MA, Kaplan Z, Miodownik H, Cassuto Y. Power spectral analysis of heart rate variability in posttraumatic stress disorder patients. Biol Psychiatry 1997;41:627–629.
23. Yehuda R, Southwick S, Nussbaum G, Wahby V, Giller E, Mason J. Low urinary cortisol excretion in patients with posttraumatic stress disorder. J Nerv Ment Dis 1990;176:366–369.
24. Yehuda R, Southwick S, Giller E, Ma X, Mason J. Urinary catecholamine excretion and severity of PTSD symptoms in Vietnam combat veterans. J Nerv Ment Dis 1992;180:321–325.
25. Yehuda R, Boisoneau D, Lowy M, Giller E. Dose-response changes in plasma cortisol and lymphocyte glucocorticoid receptors following dexamethasone administration in combat veterans with and without posttraumatic stress disorder. Arch Gen Psychiatry 1995;52:583–593.
26. Yehuda R, Levengood R, Schmeidler J, Wilson S, Guo L, Gerber D. Increased pituitary activation following metyrapone administration in post-traumatic stress disorder. Psychoneuroendocrinology 1996;21:1–16.
27. Yehuda R. Sensitization of the hypothalamic-pituitary-adrenal axis in posttraumatic stress disorder. Ann N Y Acad Sci 1997;821:57–75.
28. Yehuda R, Halligan S, Grossman R, Golier J, Wong C. The cortisol and glucocorticoid receptor response to low dose dexamethasone administration in aging combat veterans and Holocaust survivors with and without posttraumatic stress disorder. Biol Psychiatry 2002;52: 393–403.
29. Landen M, Hogberg P, Thase ME. Incidence of sexual side effects in refractory depression during treatment with citalopram or paroxetine. J Clin Psychiatry 2005; 66:100–106.
30. Scharko AM. Selective serotonin reuptake inhibitor-induced sexual dysfunction in adolescents: A review. J Am Acad Child Adolesc Psychiatry 2004;43:1071–1079.
31. Novaco RW, Chemtob CM. Anger and combat-related posttraumatic stress disorder. J Trauma Stress 2002;15: 123–132.
32. Foa EB. Psychosocial therapy for posttraumatic stress disorder. J Clin Psychiatry 2006;67:40–45.