Evidence for Poorer Outcome in Patients With Severe Negative Trauma-Related Cognitions Receiving Prolonged Exposure Plus Cognitive Restructuring

Implications for Treatment Matching in Posttraumatic Stress Disorder

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Abstract: In the current article, we address the existing assumption in the literature on cognitive behavioral treatment of PTSD that patients with severe negative trauma-related cognitions would benefit more from a treatment package that includes exposure and cognitive techniques compared with a treatment that includes exposure only. To test this assumption, 54 PTSD patients were randomized to prolonged exposure therapy or prolonged exposure therapy plus cognitive restructuring. Contrary to expectations, findings revealed that patients characterized by more severe pretreatment trauma-related cognitions (and more severe pretreatment PTSD symptoms) fared slightly worse in treatment combining exposure and cognitive restructuring. However, there was no relationship between pre- and post-treatment measures of negative cognitions and PTSD symptoms in the exposure alone group. The implications of these findings for examining Person X Treatment interactions and the efficacy of combining treatments for PTSD are discussed.

Key Words: Posttraumatic stress disorder (PTSD), treatment matching, cognitions, anxiety, trauma.

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Although over 4 decades have passed since Paul (1967) called for determining "what works for whom," there is a paucity of research matching specific treatments to specific persons. Perhaps this is due to the fact that therapy in general, and especially cognitive behavioral therapy, seems to be beneficial for the majority of patients (cf. Barlow, 2008; Nathan and Gorman, 2007). However, there are a significant number of patients who do not profit sufficiently from therapy, and researchers and clinicians continue to suggest that to enhance treatment efficacy, patients should be matched to treatments. The aim of the current article is to pursue this idea by examining the hypothesis that pretreatment negative trauma-related cognitions will predict differential treatment response to prolonged exposure therapy versus prolonged exposure therapy plus cognitive restructuring in a sample of PTSD patients.

Both exposure and cognitive therapies have been shown to produce significant reductions in PTSD and related symptoms, and tend not to differ from one another in their efficacy (Marks et al., 1998; Tarrier et al., 1999). Moreover, several attempts at combining the 2 techniques to augment outcomes have been met with negative findings. Specifically, several studies found that adding cognitive restructuring to prolonged exposure did not enhance the efficacy of the latter (e.g., Foa et al., 2005; for a review, see Foa et al., 2002; for an exception, see Bryant et al., 2008).

Although, on the whole, the efficacy of cognitive behavioral therapy programs for PTSD do not differ significantly from one another, it may be argued that individual PTSD patients may respond better to one program than to another. Such suggestions have been voiced but data speaking directly to this issue are sparse. For example, Tarrier et al. (1999) noted that ". . . our clinical experience has suggested that some patients fail to benefit from exposure because the meaning of their experiences and the emotions exposure generates appear to interfere with habituation. These clinical findings indicate that a treatment that focused on the meaning and the emotional consequences of the trauma rather than directly on the trauma per se may well be effective" (p. 13). More recently, Moore et al., (2004) dedicated a chapter to discussing the "optimal integration" of cognitive techniques with exposure therapy for different clients, and suggest that "It may be through case reports of treatment tailoring that we gain vital insights into the most beneficial shifts of techniques with individual PTSD personality presentations" (pp. 145–146).

To our knowledge, the only published evidence of differential predictors of treatment outcomes in PTSD, summarized by Foa and Cahill (2002), comes from a secondary analysis of data from a RCT comparing prolonged exposure (PE), stress inoculation training (SIT), and their combination (PE/SIT; Foa et al., 1999). As with other treatment studies for PTSD, overall outcomes for the 3 active treatments were superior to a wait list control condition, but did not differ from one another on measures of PTSD. However, several findings relevant to the issue of treatment matching emerged: (1) higher pretreatment levels of general anxiety predicted more severe PTSD at post-treatment in the PE group; (2) pretreatment levels of depression and PTSD did not predict outcome in the PE group; and (3) higher pretreatment levels of depression and PTSD predicted more severe PTSD at post-treatment in the SIT group. The authors suggested that PE may be more effective for patients with higher pretreatment levels of PTSD and depression, whereas SIT may prove more effective for those reporting high levels of pretreatment general anxiety. The findings reported by Foa and Cahill (2002) suggest that certain pretreatment variables may predict differential response to treatments for PTSD and that secondary analyses of existing RCT data sets may constitute a useful first step in identifying possible treatment matching variables, as studies specifically designed to examine Person X Treatment interactions are extremely costly, requiring large samples (therefore, we agree with other researchers who have argued for an amassing of statistically "weaker" [e.g., lower powered] findings that can provide clinicians and researchers alike with a foundation from which to work [Cronbach and Snow, 1977; Dance and Neufeld, 1988; Klein and Ross, 1993]).

Contemporary theories propose that negative trauma-related cognitions mediate the development and maintenance of PTSD and

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therefore are central to the mechanisms of its treatment (Ehlers and Clark, 2000; Foa and Cahill, 2001; Foa and Rothbaum, 1998; Resick and Schnicke, 1992). Empirical evidence generally supports these theories. For example, Foa et al. (1999) found that individuals with PTSD were characterized by more severe negative beliefs about the world and themselves (including self-blame) compared with traumatized individuals without PTSD and nontraumatized individuals. More recently, Bryant and Guthrie (2007) and Kleim et al. (2007) showed that negative trauma-related cognitions assessed prior to or shortly after trauma exposure, respectively, predicted later PTSD symptoms. In the context of treatment, Foa and Rauch (2004) found that reductions in trauma-related cognitions were significantly related to reductions in PTSD symptoms following PE and PE plus cognitive restructuring (PE/CR). Interestingly, Foa and Rauch did not find overall differences between the 2 treatment groups on change in negative trauma-related cognitions at post-treatment or follow-up assessments.

The studies discussed above suggest that negative trauma-related cognitions play an important role in the development, maintenance, and treatment response of PTSD, but their role in predicting response to different treatments has not yet been examined. Following Tarrier et al's (1999) suggestion discussed earlier, we examined the hypothesis that more severe pretreatment trauma-related cognitions would be associated with poorer outcome in patients who received PE alone but not in patients receiving PE/CR, in which these cognitions would be explicitly addressed. To this end, we conducted a reanalysis of the data reported in Foa and Rauch (2004) and compared the relationship between pretreatment trauma-related cognitions and post-treatment PTSD symptoms in patients receiving PE versus patients receiving PE/CR.

METHODS

Participants and Procedure

Participants were 54 female sexual or nonsexual assault survivors with a primary diagnosis of chronic PTSD drawn from a larger treatment outcome study (Foa et al., 2005) who had pre- and post-treatment data on both negative cognitions and PTSD symptom severity. Specifically, the current sample comprised the same subjects used in Foa and Rauch (2004). Therefore, details regarding the recruitment and characteristics of this sample have been reported before and, for brevity, are not repeated here. Half of the sample received PE ($n = 27$) and the other half received PE/CR ($n = 27$). In general, the 2 treatment groups did not differ on potentially confounding pretreatment measures (i.e., severity of PTSD symptoms, severity of trauma-related cognitions, severity of depression, age, and race [Foa and Rauch, 2004]).

Measures

PTSD Symptom Scale—Interview

The PSS-I (Foa et al., 1993) is a 17-item interviewer-administered measure that asses the severity of PTSD symptoms according to DSM-IV criteria (American Psychiatric Association, 1994). The PSS-I has demonstrated excellent reliability and validity.

Posttraumatic Cognitions Inventory

The PTCI (Foa et al., 1999) is a 36-item self-report measure that assesses trauma related thoughts and beliefs. Three of these items are experimental and are not included when calculating subscale scores. Individuals rated the occurrence of thoughts and beliefs using a seven-point Likert scale ranging from 0 (not at all) to 3 (almost always). The measure comprises 3 factors: negative cognitions about self (PTCI-Self; 21 items), negative cognitions about the world (PTCI-World; 7 items), and self blame (PTCI-Blame; 5 items). The PTCI-self measures the extent to which the individual has a negative view of him/herself and symptoms and thoughts of helplessness and alienation. The PTCI-World measures the degree to which the individual lacks trust in other people and believes the world to be unsafe. The PTCI-Blame scale measures the extent to which the individual attributes the occurrence of the traumatic event to something that he or she did or did not do. The 3 factors have shown excellent internal reliability as well as good test-retest reliability. Additionally, the PTCI has excellent convergent and discriminant validity. Total scores for the PTCI are calculated by summing all 33 items. Subscale scores, on the other hand, are calculated as the mean item response in keeping with the original scoring procedure (Foa et al., 1999).

PTSD Symptom Scale—Self-Report

The PSS-SR (Foa et al., 1993) is a self-report version of the PSSI. The PSS-SR has been found to be internally consistent ($\alpha = 0.91$) and stable over a 1-month period ($r = 0.74$). Patients rated the frequency/severity of their symptoms in the past week. The PSS-SR was used to determine response to treatment after 8 sessions of therapy, at which time treatment either ended after the standard 9 sessions or continued an additional 3 sessions (see below for details).

Treatments

Detailed descriptions of the 2 treatment modalities compared here have been reported previously (Foa et al., 2005; Foa and Rauch, 2004); however, due to the nature of the current investigation, we though it helpful to recapitulate the key similarities and differences between them.

Five doctoral level clinicians delivered the treatments. During the startup phase of the study, therapists attended a 5-day expert (E.B.F. and Constance V. Dancu) led workshop in PE and a separate 5-day expert (David M. Clark) led workshop in CR. Trainings involved teaching therapists to use manuals that provided session by session instructions on how to conduct each treatment. Ongoing supervision was conducted by E.B.F., Constance V. Dancu, and Elizabeth A. Hembree. Several videotapes of early PE-CR sessions were viewed by D.M. Clark who provided the therapists with feedback.

Both treatments consisted of 9 to 12 weekly, 90 to120 minute, sessions. The total number of sessions varied between 9 and 12; patients who did not show at least 70% reduction in symptoms on the PSS-SR at session 8 were offered 3 additional sessions beyond the standard 9- session protocol.

Both treatments began with 2 sessions dedicated to psychoeducation and the development of an in vivo exposure hierarchy. Patients assigned to PE began imaginal exposure (revisiting of the trauma memory) in session 3, wherein they were instructed to close their eyes and recount the trauma memory in the present tense for 45 to 60 minutes. Following imaginal exposure, therapists discussed briefly the patients' anxiety during the imaginal exposure and during in vivo exposure at home. They did not discuss thoughts and beliefs related to the trauma in general and to the recounting of the traumatic memory specifically. Subsequent sessions were conducted in a similar fashion: every session began with the reviewing of homework, followed by 30 to 45 minutes of imaginal exposure, followed by a discussion of the imaginal exposure, and finally therapists assigned imaginal and in vivo exposure homework. Patients assigned to PE/CR received a similar treatment with the following changes. First, session 3 involved a detailed discussion of the role of maladaptive trauma-related cognitions in the maintenance of PTSD symptoms and cognitive restructuring (CR) that involved identifying and challenging erroneous cognitions and using daily thought diaries to record this process. Specifically CR was tailored to each patient, focusing on the impact of the trauma on the patient's thoughts and beliefs about herself, and the world, including other

people. Imaginal exposure was introduced to PE/CR patients in session 4, following a review of patients' thought diaries. Subsequent PE/CR sessions followed a similar structure to the PE sessions in that sessions began with a review of homework, followed by 30 to 45 minutes of imaginal exposure. In place of the discussion about the anxiety experienced during the imaginal and in vivo exposure, patients in the PE/CR group received about 25 minutes of formal CR using the Socratic method developed by Beck (Beck and Emory, 1985). At the end of each session, patients in the PE/CR group were assigned the same imaginal and in vivo exposure homework as those of the PE patients. In addition, they were instructed to practice CR, using the thought diaries. See Foa et al. (2005) for findings concerning treatment adherence in the complete sample.

RESULTS

Description of Analyses

To test the hypothesis about differential relationships between pretreatment negative trauma-related cognitions and post-treatment PTSD severity in patients receiving PE versus patients receiving PE/CR, we conducted separate correlational analyses in each group. Specifically, correlations between pretreatment PTCI total and subscale scores and post-treatment PSSI scores were separately calculated for the PE and PE/CR groups. We predicted a positive relationship between the pretreatment PTCI scales and the post-treatment PSSI scores in the PE group, but no relationship in the PE/CR group. The latter treatment was expected to reduce the patients' negative cognitions more successfully than the former one.

Although the PTCI is generally correlated with measures of PTSD severity (e.g., Foa et al., 1999), we did not conduct partial correlations covarying out pretreatment PSSI scores from the correlation between pretreatment PTCI scores and post-treatment PSSI scores. This is because the PTCI measures a component of PTSD and does not tap a theoretically distinct construct that needs to be statistically isolated from PTSD severity scores per se. To investigate whether there was a general pattern evident in the correlations between pre- and post-treatment measures in each group, we also conducted correlations between pre- and post-treatment PSSI scores.

Descriptive statistics for the PTCI and PSSI in the 2 treatment groups are presented in Table 1.

TABLE 1. Descriptive Statistics for the PTCI and PSSI in the PE and PE/CR Groups

	Group					
	PE			PE/CR		
Variable	M	*SD*	Range	M	*SD*	Range
PSSI pre	33.20	6.05	22–42	33.92	7.07	21–48
PSSI post	8.37	8.44	0–41	9.95	10.33	1–46
PTCI Total pre	134.52	35.02	64–186	141.41	41.09	68–229
PTCI Self pre	3.86	1.14	1.48–5.52	4.01	1.45	1.90–7.00
PTCI World pre	5.29	1.14	1.86–7.00	5.66	1.58	3.43–7.00
PTCI Blame pre	3.52	1.49	1.00–6.25	3.74	1.79	1–7.00

PTCI Total scores were computed as the sum of the 33 items whereas the Self, World, and Blame subscales were computed as the mean item score. No group differences reached significance for any measure at either time point.

PE indicates prolonged exposure; PE/CR, prolonged exposure plus cognitive restructuring; PSSI, PTSD symptom scale—interview; PTCI Total, posttraumatic cognitions inventory total; PTCI-Self, posttraumatic cognitions inventory—negative cognitions about self; PTCI-World, posttraumatic cognitions inventory—negative cognitions about world; PTCI-Blame, posttraumatic cognitions inventory—self-blame.

Correlations in the PE Group

Contrary to our predictions, the correlations between pretreatment PTCI scores and post-treatment PSSI scores in the PE group were nonsignificant (rs < 0.13, ps > 0.55). Similarly, the relationship between pre- and post-treatment PSSI scores was nonsignificant ($r = 0.26$, $p = 0.19$).

Correlations in the PE/CR Group

In contrast to the absence of significant relationships between pretreatment measures of negative cognitions and post-treatment measures of PTSD severity in the PE group, several significant correlations emerged in the PE/CR group, all of which were in the opposite direction to our predictions. Pretreatment PTCI-Total, World, and Self scores were positively correlated with post-treatment PSSI scores, $r = 0.49$, 0.47, and 0.51 ($ps < 0.015$), respectively. However, pretreatment PTCI-Blame scores were not significantly related to post-treatment PSSI ($r = 0.18$, $p = 0.38$). Finally, a significant positive correlation between pre- and post-treatment PSSI scores also emerged ($r = 0.59$, $p = 0.002$). Thus, results from the PE/CR group indicated that higher levels of pretreatment negative cognitions and PTSD symptoms were related to higher post-treatment PTSD symptoms.

DISCUSSION

In the current article, we examined the relationship between pretreatment trauma-related negative cognitions and post-treatment PTSD symptom severity in a group of patients receiving PE alone and compared it to that found in a group of patients receiving PE/CR. We hypothesized that individual differences in pretreatment trauma-related cognitions would influence response to treatment. Contrary to our hypothesis, severity of pretreatment negative trauma-related cognitions was associated with poorer outcome in patients who received PE/CR but not in patients who received PE alone. Higher pretreatment PTSD severity scores also predicted poorer outcome in the PE/CR group but not in the PE alone group. Thus, across 2 measures (trauma-related cognitions and PTSD severity), patients who had higher (worse) scores at pretreatment benefited less from a treatment that combined exposure and cognitive restructuring, whereas pretreatment severity was only modestly related to outcome in patients receiving exposure therapy only and did not achieve statistical significance. Importantly, these results emerged despite no overall group differences in pre- and post-treatment PTSD severity (Foa et al., 2005).

The fact that more severe pretreatment negative cognitions were associated with poorer outcome in the PE/CR group is inconsistent with the notion that the presence of such cognitions requires treatment that includes procedures that directly address them. The findings are consistent, however, with the view and findings that explicitly addressing cognitions in therapy via cognitive restructuring is not necessary for ameliorating PTSD symptoms, and that the repeated confrontation with traumatic memories and with trauma-related avoided situations produce changes in negative cognitions (Foa and Rauch, 2004). The current findings also speak to an extremely relevant topic in psychotherapy: the dissemination of efficacious treatment to therapists in the "real world." The current findings suggest that a simpler treatment (i.e., PE alone), which may be more transportable and cost-effective, may also benefit a broader array of patients

This investigation represents a step in examining Person X Treatment interactions in treatment for PTSD and, despite our small sample, it is useful in so far as it identifies patient groups that may or may not benefit from certain treatment packages. Moreover, our results suggest that the observed interactions may reflect relationships that are in the opposite direction to our a priori predictions. As

we suggested previously, Person X Treatment interaction studies are costly and difficult to conduct on a large scale. Investigations such as the one undertaken in the current paper as well as that summarized by Foa and Cahill (2002) represent alternative approaches for arriving at potentially useful information for making decisions about matching or tailoring treatments to individual patients (Cronbach and Snow, 1977; Dance and Neufeld, 1988; Klein and Ross, 1993; Moore et al., 2004). Furthermore, although the current findings are preliminary, smaller, more feasible undertakings such as the current one can continue to amass a database of theoretically and empirically important variables to pursue in future large-scale treatment outcome studies. While the current results suggest that negative trauma-related cognitions may represent important treatment matching variables, other cognitive, emotional, and biological makers relevant to the genesis and maintenance of PTSD should also be explored.

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