Behaviour Research and Therapy 77 (2016) 62–67

Contents lists available at ScienceDirect

Behaviour Research and Therapy

journal homepage: www.elsevier.com/locate/brat

Shorter communication

The effects of prolonged exposure and sertraline on emotion regulation in individuals with posttraumatic stress disorder

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ARTICLE INFO

Article history:
Received 6 March 2015
Received in revised form
23 November 2015
Accepted 2 December 2015
Available online 10 December 2015

Keywords:
Emotion regulation
PTSD
Prolonged exposure
Sertraline
Treatment

ABSTRACT

The effects of current posttraumatic stress disorder (PTSD) interventions on emotion regulation are relatively unknown. Many conceptualize PTSD as a disorder of emotion dysregulation, and clinicians often fear that emotion regulation impairments will not change with stand-alone PTSD treatments, particularly for individuals with pre-existing emotion regulation difficulties. The present study examined changes in emotion regulation (expressive suppression, cognitive reappraisal, negative mood regulation) with prolonged exposure (PE) therapy or sertraline, specifically examining whether those with higher pre-existing emotion regulation difficulties improved over treatment on these indices. Individuals with chronic PTSD ($N = 200$) received 10 weeks of PE or sertraline and were followed through 6-month follow-up. Emotion regulation was assessed at pre- and post-treatment and at 3- and 6-month follow-up. Individuals with poorer initial emotion regulation showed greater improvement on all indices of emotion regulation, regardless of which treatment they received. Changes occurred during active treatment and were maintained over follow-up. These findings have both theoretical and clinical implications, arguing that emotion regulation is not impaired across all individuals with PTSD and that PE and sertraline effectively address emotion regulation difficulties.

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Posttraumatic stress disorder (PTSD) is a chronic and impairing condition that can develop in the wake of trauma, with a U.S. lifetime prevalence rate of 6.8% (Kessler et al., 2005). One potential mechanism underlying the development and maintenance of PTSD is emotion regulation (e.g., Benoit, Bouthillier, Moss, Rousseau, & Brunet, 2010; Ehring & Quack, 2010; Frewen & Lanius, 2006; Weiss, Tull, Anestis, & Gratz, 2013; Weiss et al., 2012). Emotion regulation is defined as "the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (p. 275, Gross, 1998). It is often considered a key component of mental health (Gross, 2001; Gross & Munoz, 1995). Impaired emotion regulation is thought to be present in most personality disorders and in most DSM-IV Axis I disorders (Gross & Levenson, 1997), including PTSD (e.g., Benoit et al., 2010; Cloitre, Miranda, Stovall-McClough, & Han, 2005; Eftekhari, Zoellner, & Vigil, 2009; Ehring & Quack, 2010; Frewen, Dozois, Neufeld, & Lanius, 2012; Kashdan, Breen, & Julian, 2010; Litz & Gray, 2002; McDermott, Tull, Gratz, Daughters, & Lejuez, 2009; Moore, Zoellner, & Mollenholt, 2008; New et al., 2009; Tull, Barrett, McMillan, & Roemer, 2007; Weiss et al., 2012, 2013; Wisco, Sloan, & Marx, 2013).

In fact, it has been argued that PTSD is a disorder characterized primarily by emotion dysregulation (Frewen & Lanius, 2006). However, very few randomized control trials (RCTs) in the PTSD literature have examined emotion regulation outcomes and whether efficacious PTSD treatments without a separate, emotion regulation component can effectively improve emotion regulation. We are aware of only four PTSD RCTs that report emotion regulation outcomes and one RCT that examined the moderating role of childhood abuse on emotion regulation.

Hinton and colleagues compared emotion regulation-focused cognitive behavioral therapy (CBT) to a wait-list control in a small sample of Cambodian refugees with comorbid PTSD and orthostatic panic (Hinton, Hofmann, Pollack, & Otto, 2009). Emotion regulation, measured with a single questionnaire assessing the ability to distance oneself from painful emotions, improved over the course treatment. Cloitre, Koenen, Cohen, and Han (2002) reported large improvements in emotion regulation difficulties using an emotion

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http://dx.doi.org/10.1016/j.brat.2015.12.002
0005-7967/Published by Elsevier Ltd.

regulation-focused intervention plus imaginal exposure in comparison to a minimal attention waitlist (Cloitre et al., 2002). More recently, Cloitre and colleagues showed large improvement in emotion regulation across both an emotion regulation-focused intervention with imaginal exposure and a supportive counseling intervention with imaginal exposure (Cloitre et al., 2010). They also found marginally better negative mood regulation outcomes at 3- and 6-month follow-up for individuals receiving the emotion regulation-focused intervention with imaginal exposure compared to individuals receiving the supportive counseling with imaginal exposure (Cloitre et al., 2010).

Additionally, in a small study reporting the use of a PTSD treatment not directly targeting emotion regulation, Wisco and colleagues (Wisco et al., 2013) found greater decreases in rumination for written exposure therapy (WET) compared to a waitlist control; however, these improvements occurred during follow-up rather than active treatment and no significant effects of WET were found on other cognitive strategies. Contrary to the potentially adaptive function of reappraisal, baseline positive reappraisal was associated with less improvement in PTSD symptoms for those receiving WET. In a final study, Jerud and colleagues (Jerud, Zoellner, Pruitt, & Feeny, 2014) examined the hypothesis that individuals with a history of childhood abuse differed in their emotion regulation outcomes from those without such a history, and found that they did not. However, this study did not examine specific differential treatment effects on emotion regulation nor did it examine emotion regulation changes for individuals with higher or lower emotion regulation difficulties prior to the start of treatment. These latter questions are largely unaddressed in PTSD clinical trials to date.

Effective PTSD treatments, whether or not they directly target emotion regulation, may have a beneficial effect on emotion regulation. Selective serotonin reuptake inhibitors (SSRIs) may facilitate effective emotion regulation through their effect on the serotonin (5-HT) system. Indeed, genetic polymorphisms that are key to serotonin signaling in the brain have been associated with increases in anxiety, depression, and other disorders of emotion regulation (Lesch, 2010; Murakami, Matsunaga, & Ohira, 2009), for which SSRIs show general efficacy. Additionally, therapies such as prolonged exposure (PE) may improve emotion regulation by promoting inhibitory learning of fear responses and enhancing distress tolerance skills (Craske et al., 2008).

Given that extant PTSD treatments without a separate emotion regulation component may be sufficient for improving emotion regulation impairments, the effects of empirically-supported, stand-alone PTSD treatments on emotion regulation need to be examined. Notably, PTSD interventions without separate emotion regulation components require fewer sessions and less therapist training than treatments with added emotion regulation modules, making dissemination less complicated. Our previous work showed that childhood abuse histories did not moderate changes in emotion regulation in a heterogeneous trauma-exposed sample with chronic PTSD (Jerud et al., 2014). Here, using the same sample, we investigate whether PE and sertraline differentially influence emotion regulation and how initial emotion regulation impairments affect emotion regulation outcomes. Individuals receiving PE and sertraline were compared at pre- and post-treatment and at 3- and 6-month follow-up, with emotion regulation examined as a potential effect modifier. We hypothesized that individuals with greater initial emotion regulation difficulties would experience the largest improvements in emotion regulation (reduced expressive suppression, increased cognitive reappraisal, and increased negative mood regulation) from pre-treatment to 6-month follow-up. There was no strong *a priori* hypothesis regarding the comparative efficacy of PE or sertraline in improving emotion regulation.

1. Method

1.1. Participants

Participants ($N = 200$) were recruited from two large, metropolitan communities. Eligible participants were adults aged 18–65 years with a primary DSM-IV diagnosis of chronic PTSD (APA, 2000). Exclusion criteria included: a current diagnosis of schizophrenia or delusional disorder; medically unstable bipolar disorder, depression with psychotic features, or depression severe enough to require immediate psychiatric treatment; a current diagnosis of alcohol or substance dependence within the previous three months; an ongoing intimate relationship with an assault perpetrator; an unwillingness to discontinue current cognitive-behavioral psychotherapy or antidepressant medication; a previous, failed trial of either PE (8 sessions or more) or sertraline (150 mg/day or greater for at least 8 weeks); or a medical contraindication for the initiation of sertraline. Data presented here are emotion regulation outcomes associated with a PTSD clinical trial (NCT00127673) utilizing a doubly randomized preference design to compare PE and sertraline (Youngstrom, Feeny, Zoellner, Mavissakalian, & Roy-Byrne, 2013).

A total of 426 individuals were assessed for eligibility, of whom 172 were ineligible and 54 were eligible but not interested in study participation. The final sample was predominantly female (75.5%), Caucasian (65.5%), and not college-educated (70%). Rates of current and lifetime comorbid DSM-IV Axis I disorders were 67.1% and 91.3%, respectively. Index DSM-IV Criterion A trauma exposures reported were sexual assault (31%), non-sexual assault (22.5%), childhood assault (24%), motor vehicle accident or natural disaster (13.5%), having a loved one who died or had been exposed to violence (6.5%), and combat/war (2.5%). The mean time since index trauma was 11.97 years ($SD = 12.69$). The mean number of different lifetime DSM-IV Criterion A traumatic events was 9.05 ($SD = 6.23$).

1.2. Measures

1.2.1. Structured clinical interview for DSM-IV axis I disorders with psychotic screen (SCID-IV; First, Spitzer, Gibbon, & Williams, 1995)

The SCID-IV is a semi-structured clinical interview that assessed DSM-IV diagnostic comorbidity and exclusion criteria. In the present study, over 10% of the cases were rerated for diagnostic reliability, with good agreement for major depressive disorder ($\kappa = 0.68$, $p_{pos} = 0.88$, $p_{neg} = 0.80$), current anxiety disorders ($\kappa = 1.00$, $p_{pos} = 1.00$, $p_{neg} = 1.00$), substance abuse disorders ($p_{pos} = 0.00$, $p_{neg} = 1.00$), and other diagnoses ($p_{pos} = 0.00$, $p_{neg} = 1.00$).

1.2.2. PTSD symptom scale-interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993)

The PSS-I is a 17-item interview measuring diagnosis and severity of DSM-IV PTSD. PTSD symptoms were assessed for the worst Criterion A traumatic event using a 0 *(not at all)* to 3 *(5 or more times per week/very much)* scale, within the last two weeks. The PSS-I has good concurrent validity with the Clinician-Administered PTSD Scale (Blake, Weathers, Nagy, & Kaloupek, 1995) and the SCID-IV (Foa & Tolin, 2000). In the present study, internal consistency was acceptable ($\alpha = .65$). Approximately 10% of the cases were rerated for diagnostic reliability. Inter-rater reliability was high (ICC = 0.985).

1.2.3. Emotion regulation questionnaire (ERQ; Gross & John, 2003)

The ERQ is a 10-item self-report measure of current levels of expressive suppression (i.e., active suppression of emotional experience) and cognitive reappraisal (i.e., reinterpretation of an