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PTSD: Evidence-Based Psychotherapy and Emerging Treatment Approaches

Abstract: Posttraumatic stress disorder (PTSD) is estimated to affect 6.8% of Americans and 13%–20% of U.S. military personnel deployed to Iraq or Afghanistan. Societal impacts include psychiatric and physical comorbidities, which lead to work impairment and increasing health care costs. While treating PTSD with pharmacotherapy has accumulated some empirical support, the Institute of Medicine rates trauma-focused cognitive behavioral therapy as the only first-level treatment for PTSD. This paper explores the evidence for trauma-focused psychotherapy options including exposure therapy, cognitive processing therapy, eye-movement desensitization and reprocessing, and stress inoculation training. Emerging treatment innovations are examined, including medication-enhanced psychotherapy, virtual reality exposure therapy, psychotherapy delivered via telemedicine, and complementary and alternative medicine-based therapies.

Implications and Future Directions: Various forms of trauma-focused cognitive behavioral therapy appear to be equally efficacious. Because many patients fail to respond to these treatments, however, more research on the efficacy of alternative treatment approaches is necessary. While there is already emerging evidence for other forms of psychotherapy and alternative methods for delivering psychotherapy, rigorous studies of complementary and alternative medicine approaches are severely lacking. Research demonstrating efficacy for these different treatment options could make treatment more acceptable, tolerable, and available.

There is certainly no scarcity of posttraumatic stress disorder (PTSD) treatment research. Indeed, searches on the PubMed, PsycInfo, and clinicaltrials.gov databases will return over 700 unique—published or ongoing—PTSD treatment studies. Despite the abundance of research, the only category of psychotherapy generally recommended with a first level rating for PTSD is trauma-focused cognitive-behavioral therapy (CBT) (1, 2). While antidepressants (namely SSRIs and SNRIs) have accumulated empirical support (3) and appear to demonstrate enough evidence for wider recommendation (4), the Institute of Medicine (IOM) did not deem the evidence conclusive enough to recommend any form of pharmacotherapy for PTSD (5).

Trauma is highly pervasive, with 89.6% of Americans having experienced at least one traumatic event in their lifetime (6), ultimately leading to PTSD in 6.8% of Americans overall (7) and at least

13.8% of current American military personnel (8). More recent estimates suggest that as many as 20% of U.S. military personnel who served in Iraq or Afghanistan have or may develop PTSD, amounting to potentially 338,000 to 520,000 veterans (1). Of particular concern is the high comorbidity of suicide and PTSD, with 18.8% of individuals with

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PTSD attempting suicide and 40.3% having suicidal thoughts (9). The societal impacts of PTSD extend to general health and economic well-being. Namely, individuals with PTSD are more likely to experience surgeries, peptic ulcers, bronchial asthma, hypertension, and gastrointestinal problems (10) which, along with the primary symptoms of PTSD, lead to increased work impairment, hospitalization, and health visits (11). The resulting mental healthcare costs alone may reach an estimated \$166 billion (12).

Several psychotherapy treatment approaches with strong empirical support exist. Bradley and colleagues' meta-analysis of 26 PTSD psychotherapy studies demonstrated the strongest support for trauma-focused CBT (13). Overall, across these 26 psychotherapy RCTs, of patients who completed treatment, 67% no longer met diagnostic criteria for PTSD, while 54% exhibited clinically significant improvement (13). In this clinical synthesis, we will: 1) offer a concise review of the research evidence for the various psychotherapies used for PTSD; 2) concentrate on trauma-focused CBT, the approach with the most and strongest empirical support; and 3) discuss other forms of CBT, non-CBT psychotherapy approaches, and emerging treatment approaches, which we have categorized as medication-enhanced psychotherapy (MEP), alternative treatment deliveries, and complementary and alternative medicine (CAM).

TRAUMA-FOCUSED CBT

The goal of CBT is for patients to face instead of avoid their traumatic memories while simultaneously confronting disruptive thought patterns that reinforce avoidance of the trauma. The three most studied and utilized CBT techniques, prolonged exposure, cognitive processing therapy (CPT), and eye-movement desensitization and reprocessing (EMDR), have different protocols yet all involve some form of exposure to the trauma memory. In a review of major psychotherapy meta-analyses for PTSD, evidence from 48 studies shows CBT to have strong evidence as a treatment approach with large effect sizes in RCTs (14). Overall, CBT appears to have good, consistent empirical support, but there appears to be more evidence for some forms of CBT over others. Still, clinicians should be flexible, since patients may be less accepting of some treatments. Some therapies may be more appropriate for different traumas as in the case of CPT, which was initially designed and studied extensively with sexual traumas (15).

EXPOSURE THERAPY

Through repeated exposure to feared yet safe stimuli and memories surrounding the trauma, exposure

therapy aims for the patient to experience a decrease in fear and an increase in mastery. Prolonged exposure, the most widely used and validated protocol of exposure therapy, incorporates imaginal and in vivo exposures, processing, psychoeducation, and breathing relaxation (see Figure 1 for a case study of prolonged exposure for PTSD) (16). Only exposure therapy displayed the necessary level of evidence required to be recommended by the Institute of Medicine in their highly rigorous review of 90 RCTs for PTSD (5). For chronic PTSD (presence of symptoms for at least 3 months), prolonged exposure was most efficacious in 24 randomized and nonrandomized CBT trials (17). More recently, Powers and colleagues' meta-analysis of exposure therapy versus control conditions for PTSD treatment demonstrated exposure therapy as superior, with large effect sizes for measures of treatment response (18). However, exposure therapy was not significantly different from other active treatments (CPT, EMDR, stress inoculation training, or cognitive therapy) in terms of PTSD symptom improvement. That exposure therapy was similar in efficacy to other forms of CBT corresponds to previous meta-analytic reviews comparing CBT and psychotherapy treatment approaches for PTSD (13, 19, 20). Even though these different CBT-based treatments are similar in their inclusion of some exposure techniques, more research is needed to understand why they appear to be equally efficacious despite different protocols. Regardless, exposure therapy's efficacy is not in doubt as all of the major treatment guidelines as well as the IOM's critique of the scientific rigor of the PTSD treatment literature recommend exposure therapy as a first-line PTSD intervention, and it appears to be equally effective across different demographics and traumas (1, 2, 5, 21).

COGNITIVE PROCESSING THERAPY (CPT)

CPT emphasizes changing a patient's maladaptive cognitions related to his or traumatic experience (see Figure 2 for a case study of CPT for PTSD). Although there are some similarities to prolonged exposure, such as exposure and psychoeducation, CPT instead uses a writing narrative form of exposure that seeks to help the patient identify and reshape their maladaptive thoughts (22). There is strong support for CPT from several rigorous reviews and various treatment guidelines. When compared with exposure therapy, CPT has been shown to be equally efficacious (13, 18–21). Most of the major PTSD treatment guidelines recommend CPT with a first-level rating (2). Furthermore, CPT appears versatile in applicability, having been well tested with interpersonal traumas, as group therapy, and with emerging

Figure 1. Vignette: Treatment of PTSD Through Prolonged Exposure

Steven is a 33-year-old Operation Iraqi Freedom veteran complaining of nightmares, strong startle reactions, irritability, and poor concentration related to intrusive thoughts about events he endured in Iraq. He has had difficulty holding a job; he ended his relationship with his girlfriend because he felt she didn't understand what he was going through, and his family is concerned that he has become increasingly isolated from them. He also reported using alcohol to help decrease his anxiety level, especially at night when he becomes hypervigilant and unable to relax enough to fall asleep. After education about PTSD and how avoidance of his memories is a major factor in symptom maintenance, Steven agreed to participate in prolonged imaginal exposure therapy. The therapist taught Steven a breathing/relaxation technique to use between sessions. He worked with his therapist to identify the most distressing memory of his deployment, which was the first time he personally encountered a life or death situation. The therapist obtained the details of the event, which involved Steven having to make a split-second decision to return fire at an insurgent who was holding a civilian in front of him for protection, resulting in the death of both the insurgent and the civilian. Steven recounted the event several times during each session, using the present tense and

with his eyes closed, and was encouraged by the therapist to include thoughts and feelings during the retellings. Steven used a 0-100 rating scale to communicate his level of distress to the therapist as he recounted the event. He became extremely emotional when focusing on the "hot spot" of the seconds during which he had to make the choice between possibly taking the life of an innocent victim by returning fire, or allowing the insurgent to continue firing at Steven and his soldiers, possibly resulting in one or more of them losing their lives. Over repeated recountings, Steven became able to discuss the event in greater detail, creating a narrative that included all of the factors which led up to him being in this "no win" situation, including the decision of the insurgent to put the civilian's life in danger. He became able to process his experience with the therapist, discussing how he never expected to be in such a terrible position, and eventually coming to some peace and acceptance of having done the best he could in the moment, and that since he was here and able to talk about it, his choice may in fact have saved his and others' lives. Steven reported over the course of treatment that he was able to share more of his experience with those close to him, experiencing improved sleep, and reported decreases in intensity and frequency of his PTSD symptoms.

efficacy for combat veterans with chronic PTSD and in traumatized refugee populations (15, 23, 24). While not as frequently studied as exposure therapy, CPT remains an evidence-based, highly efficacious treatment option, and both prolonged exposure and CPT are being disseminated throughout the VA Healthcare system as empirically supported treatments.

EYE-MOVEMENT DESENSITIZATION AND REPROCESSING (EMDR)

EMDR offers a broader approach in a treatment that involves exposure and cognitive therapy but with additional bilateral stimulation, usually in the form of saccadic eye movements. There is some debate regarding the necessity of eye movements in EMDR, with some proposing that the exposure component is the active therapeutic mechanism. Ignoring the mechanism debate, the treatment literature shows EMDR to be efficacious for PTSD. Most of the treatment guidelines recommend EMDR as a first-

level psychotherapeutic approach with good evidence for PTSD treatment, with two key exceptions being the IOM and American Psychiatric Association (1). Although not warning against EMDR, the IOM cited a lack of adequate evidence to recommend it for treating PTSD (17). Recently, however, a review of seven RCTs of EMDR from the 2000s and an additional review of seven known meta-analyses involving EMDR treatment studies noted that EMDR showed efficacy for treating PTSD in all of these studies and was essentially comparable to exposure therapy and other forms of CBT (25). The evidence base supporting EMDR is growing, and it appears to be strong enough to suggest that it is an efficacious first-line psychological treatment for PTSD.

OTHER CBT

Most research on other forms of CBT have focused on stress inoculation training (SIT), which aims to help patients manage their anxiety when confronting

Figure 2. Vignette: Treatment of PTSD Through Cognitive Processing Therapy

Julie is a 24-year-old woman coming to therapy due to a deterioration in functioning following what she described as a date rape, occurring with a person she did not know very well and with whom she no longer had any contact. Julie reported that she had been unable to concentrate at work due to her constant feelings of anxiety and intrusive thoughts about the event. She reported feeling a chronic sick feeling in the pit of her stomach that did not allow her to tolerate food, and strong feelings of guilt that somehow the event was her fault. She reported being unable to sleep, fear of the dark, and acknowledged ongoing feelings of shame and helplessness. As a result, she had been avoiding spending time with friends and family, stopped dating, and was unable to share what had happened to her with anyone in her life. Following a discussion about reactions to trauma, PTSD, and the need to process her experience, cognitive processing therapy was outlined to Julie and she agreed to proceed. After beginning work with her therapist and describing the event, Julie was instructed to write impact statements describing the impact of the experience on her thoughts and beliefs about herself, others, and the world. She would also be asked later to write full accounts of the traumatic event—including all sensory details, thoughts, and feelings—to be read in session and daily. Julie was very responsive to the fight-flight-freeze

reaction discussion, learning that she may have shut down physically and emotionally as a way to survive the event. She also learned via daily monitoring of thoughts, feelings, and behavior to identify and challenge problematic automatic thoughts and assumptions (e.g., “I should somehow have known this was going to happen”), to examine her beliefs (e.g., “bad things like this don’t happen to good people”; “I must be bad and deserved this”), and to accept the reality of the event and develop more realistic beliefs. She began to realize that blaming herself for not preventing the event or behaving differently did not realistically take into account her situation of being in an isolated setting where no one would have heard or helped her, being overpowered by the strength of her attacker who was a large and muscular individual, and how stunned, confused, and paralyzed with fear she was at the sudden shift in his behavior and the unexpected breach of trust and lack of response to her protests. During this process, she learned to accept and validate her feelings about the event, including grief, anger, vulnerability, and terror, and decreased the generalization of these feelings to other areas of her life. At the conclusion of treatment, Julie was able to experience an increase in self-trust and confidence in her judgment and competence, return to work productively, and resume family and social relationships.

their traumatic memory or other trauma-related stimuli. Although far less studied than exposure therapy, CPT, or EMDR, meta-analyses that have included SIT approaches found it efficacious and with clinically significant effects (13). There are some recommendations for SIT from the major treatment guidelines, but it is important to note that its study has been limited to civilian populations (2). Other forms of CBT that combine techniques such as cognitive therapy and exposure have been studied, but these are not theoretically different from the predominant CBT approaches used for PTSD: exposure therapy, CPT, and EMDR.

OTHER PSYCHOTHERAPY

The evidence for other forms of psychotherapy (e.g., psychodynamic) is sparse and lacking in well-controlled studies and RCTs. While there is much

anecdotal and clinical support for psychodynamic psychotherapy, to this date, only one RCT has shown positive results (26). Brom and colleagues’ RCT of hypnosis and psychodynamic psychotherapy found both to be superior to wait-list control conditions for reducing PTSD symptoms (26). While some PTSD treatment guidelines (e.g., the VA/DOD and International Society for Traumatic Stress Studies) note that there is some use for psychodynamic approaches, the most rigorous reviews of the PTSD psychotherapy literature state that the evidence is insufficient to recommend psychodynamic psychotherapy or hypnosis (2, 5, 19).

There are several other treatment approaches that have been utilized for PTSD such as acceptance and commitment therapy, dialectical behavior therapy (DBT), and skills training in affective and interpersonal regulation (STAIR), with some theoretical basis. Despite their rationale and efficacy for

treating other disorders, acceptance and commitment therapy and DBT have positive findings only from case studies, while STAIR from just one clinical trial (27). Overall, these more novel treatments show promise but require more evidence to recommend their use for treatment of PTSD.

EMERGING TREATMENTS

Although there is strong evidence for various forms of trauma-focused CBT for PTSD, many patients fail to respond to treatment, making it increasingly important to innovate and study novel treatment approaches. While the majority of PTSD patients will respond to treatment, results from rigorous meta-analyses of psychotherapy and pharmacotherapy RCTs for PTSD suggest that a significant minority will maintain their PTSD diagnosis, or worse, fail to respond to treatment (3, 13). We will now present several novel approaches that have shown promising evidence for treating PTSD but may have their unique limitations as well (e.g., the potential for abuse with MDMA/ecstasy as a cognitive enhancer).

MEDICATION-ENHANCED PSYCHOTHERAPY (MEP)

Still relatively novel, there is emerging evidence for various MEP approaches from several RCTs. Essentially, MEP involves some combination of a drug with psychotherapy. The approaches used vary from medications that may contribute additional benefit to others designed to facilitate the psychotherapy without directly targeting PTSD symptoms. Thus far, the most well studied MEP approach is SSRI-augmented prolonged exposure, which has shown mixed yet promising results in three published RCTs. The initial RCT first assigned each patient to sertraline, later randomizing to continued sertraline alone or sertraline combined with prolonged exposure, finding that only partial SSRI responders experienced added improvement when receiving prolonged exposure (28). Next, Simon and colleagues found no additional benefit of adding an SSRI to patients that initially received prolonged exposure (29). Administering an SSRI and prolonged exposure simultaneously, Schneier and colleagues' more recent RCT found paroxetine and prolonged exposure together superior to prolonged exposure alone (with placebo), although differences disappeared at the follow-up assessments (30). These studies are difficult to compare because each used a different design; however, psychotherapy such as prolonged exposure may be useful for those who fail to respond to SSRI pharmacotherapy. Furthermore, the fact that simultaneous treatment

with an SSRI and prolonged exposure showed initially positive results is consistent with anecdotal clinical evidence that many patients in psychotherapy trials are often already taking SSRIs or other psychiatric medications.

Cognitive enhancers are the most commonly used of the MEP approaches that aim to make the psychotherapy more effective without acting directly on PTSD symptoms. D-Cycloserine, an antibiotic originally used for treating tuberculosis, heightens glutamate activity and cell change processing in brain pathways associated with fear memory and extinction learning (31). The most commonly studied cognitive enhancer for PTSD treatment, with seven active studies (clinicaltrials.gov), D-cycloserine augmentation with prolonged exposure has shown mixed results in two published RCTs for PTSD, despite promising initial findings (32). While de Kleine and colleagues found that D-cycloserine augmented prolonged exposure patients were more likely to respond to treatment and that more severely symptomatic patients exhibited superior improvement gains than patients receiving PE with placebo (33), Litz and colleagues' results of an RCT of D-cycloserine and prolonged exposure were entirely negative (34). Perhaps further replication will provide more consistent, positive results for D-cycloserine MEP, but it could be a viable alternative treatment for difficult to treat populations. Based on their efficacy in extinction training, the other cognitive enhancers theorized to be used as MEP for PTSD are hydrocortisone, yohimbine, and methylene blue. These medications currently have no clinical data for PTSD treatment but have four ongoing PTSD treatment trials (35).

Although, like D-cycloserine, methylenedioxymethamphetamine (MDMA or ecstasy) as a form of MEP is thought to facilitate psychotherapy, its theorized mechanism of action is entirely different. Specifically, MDMA boosts serotonin levels, thereby decreasing inhibition, increasing empathy, and creating a sense of euphoria, effects which may promote more active engagement in psychotherapy, exposure in particular (35). Currently, only two RCTs of MDMA augmented psychotherapy for PTSD have been published, both examining treatment resistant populations, with some conflicting results. While 83% of MDMA MEP patients responded to treatment in the first such RCT (36), the most recent study did not find statistically significant improvement but did observe clinically significant improvement (37). Because MDMA's behavioral effects are rather conspicuous, researchers in these studies may not have been truly blind to the patient's randomization assignment, thereby potentially influencing the results (35). Should

researchers, however, be able to find that the potential risk from neurotoxicity of MDMA is minimal and find ways to safely administer MDMA outside of a highly controlled research setting, then this MEP approach could prove very promising.

ALTERNATIVE TREATMENT DELIVERIES

Psychotherapy has traditionally been conducted in person and usually on an individual, rather than group, basis. Because patients may not have access to properly trained clinicians or may be unwilling to try some evidence-based treatments, researchers are innovating treatments to include nonindividualized and technologically based options.

Group and Couples Therapy. Like other psychiatric disorders or medical conditions, PTSD can significantly impact not just the patient's life but also the lives of his or her friends and family. Thus, group, couples, or family therapy has a strong rationale; however, the empirical evidence is mixed. Initially, a large RCT of group therapy for 360 veterans with PTSD revealed no differences in efficacy between present-centered and trauma-focused therapy (38). While there were no differences between groups, Schnurr and colleagues' study found that both forms of group therapy significantly reduced PTSD symptoms. More recently, though, positive results were found in an RCT of CBT for couples in which one partner had a PTSD diagnosis (39). Specifically, for couples receiving CBT, both PTSD symptoms and intimate relationship satisfaction significantly improved and were superior to a waitlist control group. Further replication of these results is needed, but taken together, these two studies suggest that group or couples based therapies are efficacious for PTSD. The VA often utilizes a group approach for PTSD treatment in many of its inpatient and outpatient clinics.

Virtual Reality. Rather than a form of treatment unto itself, virtual reality is a unique method for administering prolonged exposure that adds sensory details to enhance the exposure experience. It is thought that virtual reality, with the added cues, can help patients better emotionally engage and therefore process and cope with their trauma, and thereby respond to treatment (31, 40). For example, in virtual reality, the patient controls his or her movement in a virtual world designed to help replicate their traumatic experience with visual, auditory, and olfactory cues. Still fairly new, the strongest results supporting virtual reality as efficacious for PTSD come from Difede and colleagues' RCT for 9/11 World Trade Center survivors in which virtual reality patients exhibited significantly reduced PTSD symptoms relative to a waitlist control group

(41). Positive findings have also been reported in several case, pilot, and uncontrolled studies, namely in combat veterans (31, 40). Overall, the existing evidence for virtual reality is promising, and the 10 current, active studies of virtual reality for PTSD should give further insight into virtual reality's efficacy and feasibility. We emphasize that virtual reality is not a new treatment in itself but rather a novel method for delivering exposure therapy.

Telemedicine. The use of live, synchronous videoconferencing for administering psychotherapy, telemedicine has been shown to be safe, acceptable, and highly effective for improving PTSD symptoms when administered individually as prolonged exposure (42, 43). Even when delivering CBT and CPT in a group setting, telemedicine still appears to be efficacious and comparable to in person therapy (44, 45). A key advantage of telemedicine is that patients may be more likely to complete treatment because of the reduced barriers such as geography and stigma surrounding mental health facilities, making it especially valuable in the difficult to treat population of military personnel with PTSD. Though not specifically recommended in any treatment or practice guidelines, many VA clinics already offer telemedicine-delivered psychotherapy, particularly in the community-based outpatient clinics, and the VA has called for increased use of telemedicine with a goal of more than 200,000 "telemental" health consultations for the last fiscal year (VA 2012) (46).

COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM)

Complementary and alternative medicine (CAM) interventions include therapies not considered to be standard practice in the United States, but are considered part of traditional medical practice in other parts of the world and are widely used by consumers (47). Evidence-based treatments may carry issues of acceptability, appropriateness, accessibility, and the stigma of a mental health clinic setting. Accordingly, CAM approaches have risen in popularity as evidenced by the 438 unpublished, recently completed, or ongoing studies (47). Surveys estimate CAM therapy usage at approximately 36%–38% in the general population and 45% in active duty military, who most commonly use massage and relaxation for stress and pain management (48). Ninety-six percent of VA specialized PTSD treatment programs report use of at least one CAM treatment (49).

In response to the rising popularity of CAM treatments, Strauss and colleagues (46) reviewed the RCTs of CAM for PTSD, finding most of the studies of poor quality. Promising results have been

found for meditation, acupuncture, and relaxation for improving PTSD symptoms; however, with the exception of the data on acupuncture, studies were methodologically flawed due to a lack of control groups, unclear randomization and blinding procedures, and small sample sizes (49, 50). Other popular approaches such as yoga or service animals are lacking in empirical data (40). For now, CAM techniques may best be utilized as ancillary approaches for patient self-care, but more evidence is needed before they can be recommended as stand-alone treatments.

CONCLUSIONS

Treatment options for PTSD have advanced in both efficacy and the variety of forms of therapy available to those seeking treatment. Exposure therapy remains the most studied, with other CBT therapies, particularly CPT and EMDR, also found to be highly effective. Due to factors including lack of response to treatment, treatment availability, and the stigma of mental health treatment, alternative and innovative therapies are being developed to address treatment needs. Telemedicine-delivered therapy, virtual reality exposure therapy, medication-enhanced therapies, and CAM therapies are broadening the repertoire of treatment options available to both civilians and service members dealing with the challenge of PTSD.

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