

***In Vitro* Flooding of an Adolescent's Posttraumatic Stress Disorder**

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In vitro flooding was used to treat a 14-year-old male patient's posttraumatic stress disorder. Four traumatic scenes were identified, and stimulus-response imagery cues were presented in a multiple-baseline regimen across traumatic scenes. The patient's progress throughout the series was monitored through ratings of subjective units of disturbance. The patient's level of anxiety, depression, assertion, and avoidance as well as his short-term memory and ability to concentrate were assessed 1 week prior to the series, immediately after the treatment series, and 4 months after the treatment was concluded. Although the *in vitro* flooding process had a positive influence on all the outcome measures, the efficacy of the treatment was especially evident on the anxiety indices.

According to the American Psychiatric Association's (1980) *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)*, posttraumatic stress disorder (PTSD) is precipitated by a distinct stressor that is "generally outside the range of usual human experience" (p. 236) and of sufficient intensity to "invoke significant symptoms of distress from almost everyone" (p. 238). These symptoms are characterized by high levels of anxiety, unwanted recollections of the trauma, blunted affect, avoidance behaviors, and a number of disparate symptoms that were not evident before the trauma (e.g., impairment in concentration and memory). The *DSM-III* further indicated that symptoms of depression as well as "sporadic and unpredictable explosions of aggressive behavior" (p. 237) may be manifested and that "the disorder can occur at any age, including childhood" (p. 237).

Examined from a clinical perspective, three reports successfully used *in vitro* flooding to treat war-related PTSD (Fairbank, Gross, & Keane, 1983; Fairbank & Keane, 1982; Keane & Kaloupek, 1982). It is interesting to note that these studies involved American combat veterans ranging in age from 31 to 36 years and that information pertaining to the efficacy of *in vitro* flooding with younger PTSD patients has not been reported. This study is a systematic replication of the adult *in vitro* flooding research; specifically, it examines the affective,

behavioral, and cognitive parameters of PTSD throughout the treatment of an adolescent patient.

Method

Case

The patient was a 14-year-old Lebanese adolescent male who was referred for evaluation by his school principal because he "developed academic and behavioral problems" after he had been abducted by the Lebanese militia for 48 hr. The patient presented 6 months after the abduction with primary complaints involving anxiety-evoking recollections of the trauma. To a lesser extent, he complained of abduction-related avoidance behaviors, depression, and temper outbursts, as well as difficulties in concentrating and recalling information. It was also indicated that these symptoms were not evident before the trauma and that the patient had not received pharmacological therapy. The patient and his parents were informed about the symptomatology and course of PTSD. Information about the process, duration, and efficacy of systematic desensitization and *in vitro* flooding was also presented. The patient and his parents subsequently conferred and unanimously decided to pursue a course of *in vitro* flooding. Their decision was based on three considerations: (a) successful results when *in vitro* flooding was used with older PTSD cases in America, (b) the suggestion that *in vitro* flooding involves fewer treatment sessions than systematic desensitization (cf. Rychtarik, Silverman, Van Landingham, & Prue, 1984), and (c) anecdotal information involving three earlier unsuccess-

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cessful attempts to treat PTSD cases through systematic desensitization at the author's clinic.

Traumatic Scenes

Four anxiety-evoking scenes involving the chronological sequence of events of the abduction were identified. Table 1 reflects the generic components of these scenes.

Measures

The patient marked the State-Trait Anxiety Inventory (STAI; Spielberger, 1983), the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1981), and the Rathus Assertiveness Schedule (RAS; Rathus, 1973). The Wechsler Intelligence Scale for Children-Revised (WISC-R) Digit Span and Coding subtests were also administered inasmuch as investigators have reported that these subtests measure short-term memory, freedom from distractibility, and concentration (Kaufman, 1979). Information pertaining to the psychometric properties of these measures as based on the responses of Lebanese students has been reported elsewhere (Halabi, 1983; Mathia & Saigh, 1983, Saigh, 1985; Tabib, 1985).

A 12-item Behavioral Avoidance Test (BAT) was constructed to evaluate the patient's level of avoidance. The BAT items were indicative of an actual 10-min walk during which the patient left his home at a specified time, walked to the area where the abduction occurred, entered a shop, made a purchase, and returned by an alternative route. The patient was asked to report his progress on these walks to help the therapist evaluate the efficacy of the treatment. Two master's-level counseling students unobtrusively rated the patient's progress

by observing through a shop window and following him from a distance.

The patient's level of arousal *vis-à-vis* the traumatic scenes was gauged by self-monitoring the level of discomfort through subjective-units-of-disturbance (SUDS) ratings ranging from *no discomfort* (0) to *maximum discomfort* (10).

Research Design

A multiple-baseline design across traumatic scenes (Fairbank & Keane, 1982) was used. In this context, the patient's SUDS level was monitored through probe assessments conducted during baseline, treatment, and follow-up sessions. The STAI, BDI, RAS, BAT, and WISC-R subtests were administered 1 week before the baseline assessments, immediately after the treatment series, and 4 months following the final treatment session.

Baseline

The baseline probes were initiated by 10 min of therapist-controlled deep muscle-relaxation exercises. Each of the traumatic scenes was subsequently presented for 6 min. Stimulus-response imagery cues (Fairbank & Keane, 1982) were used throughout the presentation of each scene. Stimulus cues involved the visual, auditory, and physical components of each scene (e.g., the site where the abduction occurred, the faces and statements of the abductors, and the discomfort that was induced by the blindfold). Response cues involved the auditory, physical, and cognitive aspects of each scene (e.g., the patient's verbal replies to his interrogators, the pain induced by the assailant's blows, and aversive self-statements involving the possibility of being executed). The properties of each scene were slowly introduced by the therapist and information pertaining to the next chronological event was elicited from the patient. SUDS ratings were monitored at 2-min intervals, and each complete series of scene probes was followed by 5 min of relaxation exercises.

Treatment

Each session was initiated by 10 min of therapist-directed relaxation exercises. This was followed by approximately 60 min *in vitro* flooding during which the patient was asked to imagine the exact context of the selected scene through the use of stimulus and response cues. Particular emphasis was ascribed to concentrating on the most disagreeable aspects of the scene. The *in vitro* flooding process was followed by 10 min of relaxation exercises. Each of the remaining scenes was subse-

Table 1. *Traumatic Scenes*

| Scene Number | Properties |
|--------------|--|
| 1 | Approaching the area where the abduction occurred, being stopped, forced into a car at gun point, blindfolded, and driven away. |
| 2 | Walking into a building while blindfolded, being questioned, accused, and listening to the militia argue over the merits of his execution. |
| 3 | Being interrogated, responding, receiving repeated blows to the head and body, and experiencing intermittent periods of isolation. |
| 4 | Learning that he was going to be released and not trusting the militia to keep its word. |

quently presented for approximately 6 min, and probe assessments were conducted at 2 min. Participants engaged in 5 min of relaxation exercises in the intervals separating each of the scenes that were not treated.

Follow-Up

Four months after the last treatment session the patient reported for a scheduled assessment session. As in the case of the baseline session, 10 min of therapist-directed relaxation exercises were presented. Each traumatic scene was subsequently presented for 6 min, and probe assessments were conducted at 2-min intervals. Each complete scene presentation was followed by 5 min of therapist-directed relaxation exercises.

Results

In Figure 1, we see that the baseline probe assessments registered elevated SUDS ratings with little or no variation. *In vitro* flooding was associated with a rapid decrease in the level of arousal for Scenes 1, 2, and 4. Scene 3 was particularly trying for the patient, and three treatment sessions were

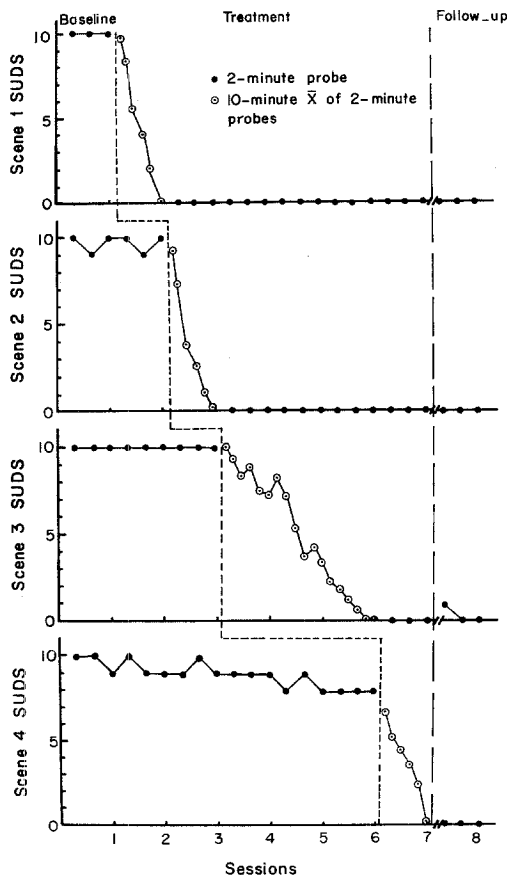


Figure 1. SUDS ratings across assessment situations.

needed to reduce the SUDS level to zero. Follow-up probe assessments registered virtually no arousal for the selected scenes.

Figure 2 reflects a schematic summary of the STAI, BDI, and RAS levels of arousal as calculated by dividing the observed raw scores by the maximum rating for each scale.

In this context it may be seen that the STAI State level of arousal decreased by 32.25% when the treatment was concluded and that level of improvement was maintained at follow-up, as evidenced by a 37.50% reduction over the initial level. Analogously, the STAI Trait level decreased by 22.50% after the treatment and by 26.25% at follow-up. The patient's level of arousal as measured by the BDI decreased by 11.68% after the treatment was concluded and by 12.88% at follow-up. The RAS posttreatment level of arousal decreased by 7.00% when the treatment was terminated and by 10.00% at follow-up.

The reliability of the observer's BAT ratings was evaluated by dividing the number of agreements by the sum of agreements and disagreements and then multiplying by 100. Reliability ratings of 100% were observed during the three assessment sessions. The BAT outcome data were scored to reflect the percentage of completion (i.e., each complete item accounted for 8.33% of the total score). According to this formulation, 33.33%, 100%, and 100% of the items were completed before the treatment, immediately after the treatment, and at follow-up. The WISC-R scaled scores for these time periods were 7, 10, and 10 for Digit Span and 8, 10, and 10 for Coding.

Discussion

The results strongly suggest that the *in vitro* flooding process had a positive influence on the patient's affective, behavioral, and cognitive outcome measures. Given that the patient's primary com-

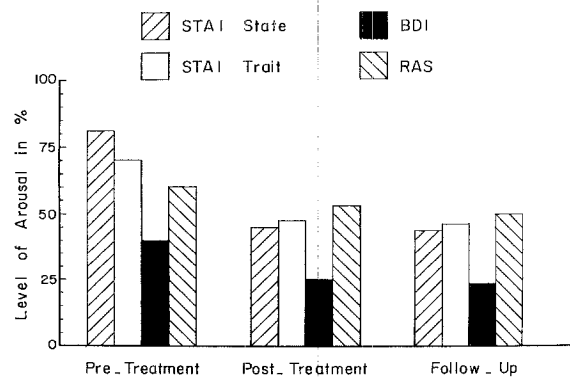


Figure 2. STAI, BDI, and RAS levels of arousal at three assessment times.

plaints involved anxiety-related thoughts about the trauma and given that the *in vitro* flooding focused exclusively on abduction-related motifs, it follows that the observed decrease in the level of anxiety should have exceeded the reductions in the levels of depression and assertion that were not directly treated.

With respect to the avoidance behaviors, the patient reported that he generally avoided the area where the abduction occurred because of the unsettled security situation in Beirut. On the other hand, he also indicated that he had made a number of visits to the location of the abduction after the treatment was terminated due to compelling circumstances and that he had not experienced an onset of anxiety during these occasions. Along these lines, it is interesting to note that the patient expressed considerable satisfaction with the treatment. He also reported that the treatment outcome was well worth the discomfort that was induced during the six flooding sessions.

Viewed from a cognitive perspective, the WISC-R results suggest that the patient's short-term memory, freedom from distractibility, and ability to concentrate markedly improved after the treatment and that this level of improvement was maintained at follow-up.

Although the outcome data support the efficacy of the *in vitro* treatment, investigators and practitioners are cautioned against drawing conclusions about the etiology of PTSD inasmuch as "one cannot argue that because a particular treatment is effective for a particular condition, it necessarily throws light on the aetiology of that condition" (Marks, 1981, p. 8). Moreover, the results should be tempered with the realization that they were formulated on the basis of a single-case analysis and that additional direct, systematic, and clinical replications would be instrumental in the search for a PTSD treatment of choice. On the other hand, the generic efficacy reflected by this report is concordant with the outcome data that were reported in the United States with older PTSD cases. In view of the patient's age and cultural background, it seems that

a degree of support for the external validity of the *in vitro* flooding modality was established.

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