

## Taped Imaginal Exposure as a Treatment for Post-Traumatic Stress Reactions

Maj JI Bisson

BM, MRCPsych, Dip Clin Psychother, RAMC\*  
Senior Registrar

Capt N Jones

RMN, RGN, BNT, QARANC

British Military Hospital, Iserlohn, BFPO 24

**SUMMARY:** The efficacy of taped imaginal exposure as a treatment for Post-Traumatic Stress Reactions (PTSR) was assessed in eighteen consecutive outpatients, including Gulf War veterans. Detailed present-tense scripts of their personal traumatic experiences were prepared and in all but two cases audio-taped and listened to regularly. The severity of PTSR and standard questionnaire scores (including the IES, BDI, GHQ8 and the SCL 90) all showed statistically significant improvements post treatment and at three month follow-up. This case series confirms the potential efficacy of taped imaginal exposure in the treatment of full and partial forms of Post-Traumatic Stress Disorder (PTSD). The simplicity of its administration and acceptability to the individual suggest that it is worthy of more thorough research.

### Introduction

Post-traumatic stress disorder (PTSD) was first formally acknowledged as a discrete diagnostic entity in 1980 (1). Symptoms of PTSD include re-experiencing phenomena, avoidance phenomena, numbing of general responsiveness and hyperarousal. Many different treatments for full blown PTSD and Post-Traumatic Stress Reaction (PTSR) have been tried with individuals and groups. Common approaches have included medication (2), psychodynamic psychotherapy (3) and cognitive-behavioural therapy (4). The results of treatment have often been disappointing and longer term follow-up studies of PTSD sufferers reveal a poor prognosis (5).

Fairbank and Nicholson (6) reviewed dynamic, behavioural and biochemical models of treatment and found that direct therapeutic exposure emerged as the single most important factor in the treatment of PTSD. This finding supports a behavioural explanation for the development of PTSD such as that postulated by Keane *et al* (4). Solomon, Gerrity and Muff (7) reviewed eleven randomised clinical trials of treatments for PTSD. They concluded that the only two forms of treatment that had been shown to be effective were medication and behavioural therapies. Behavioural techniques including direct therapeutic exposure had the strongest effect.

Exposure techniques are well established in the treatment of disorders that involve avoidance of fear-invoking stimuli (8). *In vivo* self-directed exposure is now accepted as being superior to imaginal techniques which have had only limited success in the treatment of specific phobias and do not predictably generalise to life situations (9).

In PTSD real life self-directed re-exposure to the traumatic event is undesirable. Keane *et al* (10) randomly assigned Vietnam veterans with PTSD to implosive therapy or a waiting list. Compared with pre-treatment

measures re-experiencing, anxiety and depression had all decreased in the treatment group after treatment and at six months. This led the authors to emphasise the need for systematic exposure to traumatic memories when treating PTSD. Two recent reports (11,12) have suggested that the use of imaginal exposure on its own may be an effective way of treating PTSD.

Richards and Rose (11) used audiotaped imaginal exposure by asking their subjects to record their memories in the first person and present tense onto an audio-tape. The subject then listened repeatedly to the tape between sessions until their distress habituated. Relief from PTSD symptoms was noted. Avoidance of environmental triggers however was not affected and required treatment with exposure *in vivo*. These results have been replicated in a second case series (13). In this study an additional method was used, that of "freezing" the focus on specific images that produced intense distress until habituation occurred. Foa *et al* (14) compared prolonged exposure which included audiotaped imaginal exposure with stress inoculation training, supportive counselling and a waiting list control. They found that prolonged exposure produced the best results at three and a half month follow-up. Vaughan and Tarrier (12) described similarly encouraging results from their technique of Image Habituation Training.

Avoidance of both internal and external stimuli is often the most powerful maintaining factor in PTSR. Based on this the hypothesis that repeated exposure to taped accounts of the trauma results in habituation and produces general diminution in symptoms was tested. In order to test the hypothesis it was decided to assess the use of taped imaginal exposure as the first line of treatment in consecutive patients presenting to the PTSD clinic at the British Military Hospital Iserlohn.

\*now Dept of Psychological Medicine, University of Wales College of Medicine, Heath Park, Cardiff CF4 4XN

## Method

### Subjects

Twenty-one consecutive subjects presenting to the PTSD clinic with psychological symptoms following a traumatic event were assessed for the study. Three refused treatment as they felt that they would be unable to write a script and make a tape. Of the remaining eighteen subjects, fifteen (83%) were male and three (17%) female. The mean age was 24.5 years old (standard deviation (sd) 4.7, range 20-36).

### Assessment

Basic demographic data, a full history of the trauma and the diagnostic criteria for PTSD using the Clinician Administered PTSD Schedule (CAPS) (15) were elicited during the interview. In addition the 28 Item General Health Questionnaire (GHQ28) (16), the Impact of Event Scale (IES) (17), the Symptom Check List 90 (SCL90) (18) the Fear Questionnaire (FQ) (19) and the Beck Depression Inventory (BDI) (20) were used to assess levels of symptomatology.

### Procedure

The eighteen subjects who entered treatment prepared a detailed present tense account of their traumatic experience. In cases of ongoing trauma the worst part(s) of the trauma was recalled. Subjects were instructed to incorporate cognitions and sensations in all five modalities that they had experienced during the traumatic event. The therapist then incorporated any additional details felt to be significant and the account was audiotaped during the session. As homework the subjects were asked to listen to the tape at least once daily between appointments using it as a stimulus to relive the trauma as vividly as possible.

Progress was assessed and alterations made to the tapes if necessary at subsequent appointments. None of the subjects were started on medication. When it appeared that the subjects had habituated to the tape or no further improvement was observed at two consecutive appointments the measures taken at the initial assessment were repeated. Three months later all the measures were again repeated without any further treatment.

### Statistical Analysis

The Sign test was used to compare ordinal variables. Comparisons between categorical variables were made using the Chi-squared test with Yates' correction.

## Results

Ten subjects (56%) had been involved in single traumatic incidents such as bomb explosions, the Hillsborough football stadium incident and road traffic accidents. Eight (44%) had been involved in ongoing trauma such as being held hostage. The group included nine (50%) whose problems related to experiences in the Gulf War. Median time from traumatic event to

presentation was 13.5 months (range 4-36).

Five subjects (28%) received minor injuries from the trauma and nine (50%) described suffering an acute stress reaction at the time or shortly after the trauma. Five (28%) described previous major traumatic incidents and four (22%) had seen a psychiatrist for mild psychiatric disorder in the past. Six subjects (33%) had been involved in crime since their incident which appeared "out of character". The majority of these had become physically violent on minimal provocation and one had threatened another man with a knife during a dissociative episode. Five (28%) had received psychological debriefing shortly after the traumatic incident and seven (39%) had received professional treatment including counselling and anxiolytic medication for their difficulties before presentation to the clinic.

The treatment phase lasted an average of 4.2 appointments (sd 1.1, range 3-7) over a median time period of 8.5 weeks (range 3-28). (Due to Army and other commitments four subjects only attended for repeat measures over twenty weeks after presentation. This accounts for the wide range of time periods). During the treatment phase eight subjects (44%) listened to the tape at least daily, eight (44%) listened to the tape regularly but not daily and two (11%) subjects felt unable to make a tape and chose to read their scripts instead. All eighteen subjects completed the therapy.

The results shown in the tables below include all eighteen subjects in the pre and post treatment phases, but only eleven subjects at three months due to individuals moving to other parts of the world and not being available for reassessment. Scores at three month follow up are compared with the post treatment scores of the same eleven subjects for significance level calculations.

Before treatment 11 (61%) fulfilled DSM-III-R (21) criteria for PTSD and 16 (89%) ICD-10 (22) criteria. At completion of treatment 1 (6%) had DSM-III-R and 4 (22%) ICD-10 PTSD. Three months post treatment none of the 11 followed up had DSM-III-R PTSD, and 2 (18%) had ICD-10 PTSD. The numbers of DSM-III-R B (re-experiencing), C (avoidance and numbing of responsiveness) and D (hyperarousal) criteria satisfied in each group fell after treatment by the same degree.

Seventeen (94%) reached "caseness" as defined by a GHQ28 score greater than four pre treatment compared with five (28%) post treatment and two (18%) at three months. The decrease following treatment reached statistical significance at the  $P < 0.0005$  level (Yates' corrected Chi-square = 14.14).

Table 1 gives summary statistics for the SCL90 (General Symptom Index, GSI), BDI and FQ. All measures show marked improvement ( $P < 0.005$ ) post treatment. This improvement was maintained at three months.

Table 2 shows IES scores, IES-Intrusion (IES-I) and IES-Avoidance (IES-A) subscores pre, post and three months after treatment. Markedly significant generalised

improvements can be seen post treatment with ongoing significant improvement at three months.

Table 3 illustrates a non-significant trend for those who listened to the tape daily to have greater reduction of symptoms as indicated by the IES. Significance levels were not calculated for the script only group due to the small *n* values. None of the subjects deteriorated following treatment. Two subjects continued to experience troublesome symptoms but to a lesser degree than before treatment.

**Table 1**  
Summary statistics for SCL90 (GSI), BDI and FQ.\*

	Pre (n=18) Mean (S.D.)	Post (n=18) Mean (S.D.)	3M (n=11) Mean (S.D.)
SCL90 (GSI)	1.15 (0.52)	0.37 (0.31) P<0.0001	0.37 (0.43)
BDI	19.7 (7.9)	6.3 (5.7) P<0.0001	4.6 (4.9)
FQ	21.5 (13.6)	13.6 (9.8) P<0.005	10.2 (12.7)

\*Sign test used for all variables

**Table 2**  
Summary statistics for IES.\*

	Pre (n=18) Mean (S.D.)	Post (n=18) Mean (S.D.)	3M (n=11) Mean (S.D.)
IES	46.7 (12.6)	17.4 (16.0) P<0.0005	7.8 (8.7) P<0.01
IES-I	24.4 (7.5)	9.8 (8.4) P<0.0005	3.6 (4.2) P<0.05
IES-A	22.3 (8.4)	7.6 (10.0) P<0.005	4.3 (5.5) N.S.

\*Sign test used for all variables

**Table 3**  
Summary statistics for IES scores according to the frequency taped imaginal exposure occurred.\*

	Tape at Least Daily Mean (S.D.) (n)	Tape Less Than Daily Mean (S.D.) (n)	Script Only Mean (S.D.) (n)
IES Pre	49.3 (9.6) (8)	41.1 (13.7) (8) N.S.	59.0 (4.0) (2)
IES Post	11.8 (10.5) (8)	25.6 (18.1) (8) N.S.	7.5 (7.5) (2)
IES 3M	5.5 (7.6) (5)	12.8 (9.0) (5) N.S.	2 (1)

\*Sign test used throughout

## Discussion

The results of this study suggest that taped imaginal exposure is a brief, effective treatment for PTSR. However, the study was open and uncontrolled and therefore other factors such as possible presentation when symptoms were at their worst and spontaneous recovery may have contributed to the subjects' improvement.

Although Richards and Rose (11) reported that avoidance required additional *in vivo* exposure, this was not the case in this study. Generalisation of effect did occur, with equivalent improvement in all PTSD symptom groups. It was noted that subjects began to engage in previously avoided situations and activities without specific instruction.

Other symptoms, including quite marked depressive symptomatology, as measured by the BDI, improved significantly. This suggests that the depression was secondary to the inability to assimilate the traumatic experience and did not require specific antidepressant therapy to improve (23).

Denial is almost universal shortly after a major traumatic incident. Horowitz's information processing model (24) recognises such denial as a way of gradually assimilating the traumatic event. Denial can be helpful at an early stage, but seemed to have turned into pathological avoidance and be the central maintaining factor of the symptomatology of all the subjects in this study.

The detailed nature of the scripts was designed to ensure that subjects "relived" the experience. The use of audio-tapes between sessions allowed the subjects to remain in control yet ensured prolonged exposure. Preoccupation with current meaning and cognitions rather than the trauma itself was avoided by the detailed nature of the script. Vaughan and Tarrier (12) felt such preoccupation represented avoidance that was crucial to overcome. They facilitated this by focusing on dissociating distressing images from the trauma as opposed to the whole event.

Not all the patients fulfilled all the DSM-III-R criteria for PTSD, but the high IES, GHQ and SCL90 scores indicate that the degree of disability was high pre-treatment. All subjects showed symptom reduction following treatment. No individual deteriorated with imaginal exposure although three screened themselves out by refusing to engage in the treatment proposed. The two subjects who completed treatment and continued to experience troublesome symptoms did improve. Interestingly they were unable to produce as detailed scripts as the other subjects which may have affected their outcome. Additionally some individuals may have "tuned out" when listening to the tape and effectively avoided imaginal exposure.

Listening to the tape daily seemed difficult for some. One possibility is that listening less than daily signified ongoing subtle avoidance. Increased exposure did appear to be more effective as judged by the trend shown in Table 3. It is interesting that the group who listened daily show a non-significant tendency to have higher mean IES scores initially. This may have led to increased motivation.

Almost half of the subjects described increased symptom intensity over the first two or three days of taped imaginal exposure before habituation started to

occur. This was not a problem as it had been addressed prior to the exposure phase. Thorough explanation, normalisation of some of their responses and providing rationales for the treatment during the first appointment seemed to help. This has been noted to be important by other authors (25).

The fluctuating natural course of PTSR suggests that symptoms may recur, especially with further stress. One of the subjects in this study faced with a court martial for a crime he committed during a dissociative episode had a mild resurgence of symptoms.

By re-listening to his tape for a week his symptoms disappeared as they did post treatment. This observation is extremely important and suggests that further imaginal exposure at the first sign of recurrence may eradicate the symptoms and prevent relapse. This is worthy of future study.

The response to taped imaginal exposure can be extremely rapid. No individual needed to be seen for more than seven sessions. This compares very favourably with behavioural therapies that include relaxation and a more graded, hierarchical approach, and with the twelve session brief dynamic therapy described by Krupnick (26). Original United States studies suggested that relaxation was an integral part of any behavioural treatment (4). These results suggest relaxation techniques are not necessary.

In view of the proven benefits of behavioural therapies in PTSD (7) and the success experienced with imaginal exposure it is suggested that a controlled trial is carried out (a controlled trial is now underway at the Institute of Psychiatry, London). If this confirms its effectiveness imaginal exposure should be used as a first line treatment. If imaginal exposure is unsuccessful then alternatives such as medication or other therapies may be tried and perhaps a more eclectic approach adopted. However, in our clinical experience, poor response to imaginal exposure seems to predict poor response overall. A mistake often made is to consider PTSR as more complex than it really is. It is far better initially to try to focus on the direct cause of the psychological difficulties (trauma) than to provide multiple interventions that may lead to confusion in the sufferer.

In summary, taped imaginal exposure shows promise as a simple, brief and cost-effective method of treating PTSR. It seems acceptable to the sufferer and is non-invasive. The fact that most of the exposure is done outside the clinic ensures that the sufferer maintains control. With regular exposure symptoms can improve rapidly. This and the other case series quoted in the paper are encouraging but need replication in controlled prospective studies, comparing imaginal exposure with no intervention and with other treatments for PTSR.

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#### REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 3rd ed. Washington DC: APA, 1980.
2. DAVIDSON JRT. Drug therapy of post-traumatic stress disorder. *Br J Psychiatry* 1992; **160**: 309-314.
3. HOROWITZ MJ. Phase-oriented treatment of stress response syndromes. *Am J Psychother* 1973; **27**: 506-515.
4. KEANE TM, FAIRBANK JA, CADDELL JM, ZIMERING RT, BENDER ME. A behavioural approach to assessing and treating PTSD in Vietnam veterans. In: Figley CR, Ed. Trauma and its wake. New York: Brunner/Mazel, 1985.
5. MCFARLANE AC. The longitudinal course of post-traumatic morbidity: The range of outcomes and their predictors. *J Nerv Ment Dis* 1988; **176**: 30-39.
6. FAIRBANK JA, NICHOLSON RA. Theoretical and empirical issues in the treatment of post-traumatic stress disorder in Vietnam veterans. *J Clin Psychol* 1987; **43**: 44-55.
7. SOLOMON SD, GERRITY ET, MUFF AM. Efficacy of treatments for post-traumatic stress disorder: An empirical review. *Am J Psychiatry* 1992; **268**: 633-638.
8. MARKS IM. Cure and care of neurosis: theory and practice of behavioural psychotherapy. New York: John Wiley and Sons, 1981.
9. RACHMAN SJ. The effects of psychotherapy. Oxford: Pergamon Press, 1971.
10. KEANE TM, FAIRBANK JA, CADDELL JM, ZIMERING RT. Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans. *Behav Ther* 1989; **20**: 245-260.
11. RICHARDS DA, ROSE JS. Exposure therapy for post-traumatic stress disorder. Four case studies. *Br J Psychiatry* 1991; **158**: 836-840.
12. VAUGHAN K, TARRIER N. The use of image habituation training with post-traumatic stress disorders. *Br J Psychiatry* 1992; **161**: 658-664.
13. RICHARDS DA, LOVELL K. Behaviour therapy for post-traumatic stress disorder: treatment outcome and follow-up. Paper presented at "PTSD clinical and research perspectives" conference, London: 1991.
14. FOA EB, OLASOV ROTHBAUM B, RIGGS DS, MURDOCK TB. Treatment of post-traumatic stress disorder in rape victims: a comparison between cognitive-behavioural procedures and counselling. *J Consult Clin Psychol* 1991; **59**: 715-723.
15. BLAKE DD, WEATHERS FW, NAGY LN, KALOUPEK DG, KLAUMINZER G, CHARNEY DS, KEANE TM. A clinician rating scale for assessing current and lifetime PTSD: The CAPS-1. *Behav Ther* 1990; **18**: 187-188.
16. GOLDBERG DF, HILLIER VF. A scaled version of the General Health Questionnaire. *Psychol Med* 1979; **9**: 139-145.

17. HOROWITZ MJ, WILNER NR, ALVAREZ W. Impact of Event Scale: A measure of subjective stress. *Psychosom Med* 1979; **41**: 209-218.
18. DEROGATIS LR, LIPMAN RS, COVI L. SCL-90: an outpatient psychiatric rating scale – preliminary report. *Psychopharmacol Bull* 1974; **9**: 13-28.
19. MARKS IM, MATHEWS A. Brief standard self-rating for phobic patients. *Behav Res Ther* 1979; **17**: 263-267.
20. BECK AT, WARD CH, MENELSON M, MOCK J, ERBAUGH, J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; **4**: 561-571.
21. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 3rd ed revised. Washington D C: APA, 1987.
22. World Health Organisation. The ICD-10 classification of mental and behaviour disorders: clinical descriptions and diagnostic guidelines. Geneva: WHO, 1992.
23. BISSON JI, JONES N. Drug therapy of post-traumatic stress disorder. *Br J Psychiatry* 1992; **161**: 130.
24. HOROWITZ MJ. Stress response syndromes: Character style and dynamic psychotherapy. *Arch Gen Psychiatry* 1974; **31**: 768-781.
25. VERONEN LJ, NICHOLSON R A. Theoretical and empirical issues in the treatment of post-traumatic stress disorder in Vietnam veterans. *J Clin Psychol* 1987; **43**: 44-55.
26. KRUPNIK J. Brief psychotherapy with victims of violent crime. *Victimology: An International Journal* 1980; **2**: 347-354.