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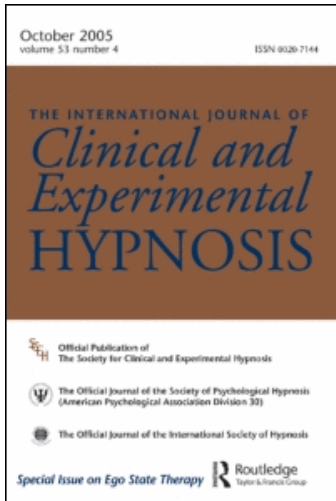
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A NEW HYPNOTIC TECHNIQUE FOR TREATING COMBAT-RELATED POSTTRAUMATIC STRESS DISORDER: *A Prospective Open Study*¹

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Abstract: Many combat veterans with posttraumatic stress disorder (PTSD) have an olfactory component to their traumatic memories that might be utilized by a technique called hypnotherapeutic olfactory conditioning (HOC). Thirty-six outpatients with chronic PTSD, featuring resistant olfactory-induced flashbacks, were treated with six 1.5-hour sessions using hypnosis. The authors used the revised Impact of Events Scale (IES–R), Beck Depression Inventory, and Dissociative Experiences Scale as outcome measures. Significant reductions in symptomatology were recorded by the end of the 6-week treatment period for the IES–R, as well as for the Beck Depression Inventory and the Dissociative Experiences Scale; 21 (58%) of the subjects responded to treatment by a reduction of 50% or more on the IES–R. Improvement was maintained at 6-month and 1-year follow-ups. Use of medication was curtailed. HOC shows potential for providing benefit to individuals suffering from PTSD with olfactory components.

Chronic posttraumatic stress disorder (PTSD) can be a particularly prevalent problem among members of armed forces exposed to combat (Sareen et al., 2007; Stimpson, Thomas, Weightman, Dunstan, & Lewis, 2003) and may be difficult to treat effectively. While multiple treatment approaches are used for PTSD, including cognitive-behavioral therapy

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(CBT; [Harvey, Bryant, & Tarrrier, 2003](#)), exposure therapy ([Rothbaum & Schwartz, 2002](#)), and pharmacotherapy ([Zhang & Davidson, 2007](#)), significant distress often remains, so that any therapeutic intervention that may offer additional benefit ought to be explored.

Hypnosis for the treatment of trauma victims has a long pedigree (Breuer & Freud, 1895/1982; Janet, 1889) and continues to be employed in the treatment of PTSD. Several studies have suggested a place for hypnosis in the treatment of PTSD ([Cardeña, 2000](#); [Cardeña, Maldonado, Hart, & Spiegel, 2000](#); [Lynn & Cardeña, 2007](#)). Hypnosis has several advantages when working with PTSD sufferers. First of all, hypnosis may work by producing a dissociative state in the patient ([H. Spiegel & Spiegel, 1987](#)). Persistent dissociation in the aftermath of a trauma ([Hagenaars, van Minnen, & Hoogduin, 2007](#)), though not necessarily at the time of the trauma ([Van der Velden & Wittmann, 2008](#)), may predict the subsequent development of PTSD. Continuing dissociative phenomena are a serious cause of suffering and disability in PTSD ([Van der Velden & Wittmann; Hagenaars et al.](#)). Hypnosis, then, may be a treatment modality tailored to the nature of the symptom, which can further be used to reframe dissociative phenomena for therapeutic purposes ([Cardeña et al.](#)).

A second potential advantage of a hypnotic intervention is that hypnosis is a flexible form of treatment that can target nondissociative symptoms as well, such as anxiety and emotional withdrawal. Third, hypnosis can easily be integrated as an adjunct therapy employed with other treatment approaches. Fourth, evidence suggests that people with PTSD tend to be more highly hypnotizable than the general population ([Bryant, Guthrie, Moulds, Nixon, & Felmingham, 2003](#); [D. Spiegel, Hunt, & Dondershine, 1988](#)) and may therefore be well suited to respond to the careful administration of hypnosis.

Hypnotherapeutic olfactory conditioning (HOC; [E. G. Abramowitz, Israel Society of Hypnosis, Tel Aviv, Israel, 2003](#)) is a technique that helps the patient develop new olfactory associations to overcome anxieties and dissociative states. While the specifics of each application of the technique will of course vary in accordance with the details of the distress and the factors that caused and maintained the pathological situation, unique to HOC is the development, under hypnotic conditions, of a positive olfactory association (sometimes referred to by neuro-psycholinguists as an "anchor"; [Bandler & Grinder, 1973](#)), which allows the patient to regain control of his or her symptoms, especially when they are triggered by olfactory stimuli.

The sense of smell can be powerfully evocative of memories ([Herz & Reich, 1995](#); [Maylor, Carter, & Hallett, 2002](#)). The olfactory bulb, the only part of the brain in direct contact with the physical environment, sends output fibers to limbic and neocortical areas involved in storing memories and processing emotions. The amygdala, in particular, plays

a role in the long-term, unconscious storage of memories of fear, as well as in the emotional processing of olfactory stimuli (Otto, Cousins, & Herzog, 2000; Zald & Pardo, 1997). These neuroanatomical connections are the substrate for the observed relationship between emotion and olfaction (Herz & Cupchik, 1995; Herz & Reich).

The ability of olfactory stimuli to evoke vivid flashbacks of trauma scenes in individuals suffering from combat-related PTSD has been noted (Kline & Rausch, 1985; Vermetten & Bremner, 2003). A recent positron tomographic emission study of combat veterans with PTSD revealed an activation in the amygdala, insula, medial prefrontal, and anterior cingulate cortical areas upon reexposure to olfactory elements of the traumatic memories (Vermetten, Schmah, Southwick, & Bremner, 2007).

The suggestion has been made that the intense emotional response to olfactory stimuli might be exploited for therapeutic purposes (Vermetten & Bremner, 2003). We have reported the use of HOC to treat a case of combat-related PTSD (Abramowitz & Lichtenberg, 2009).

HOC incorporates elements of CBT, which is the most thoroughly studied and evidence-based psychotherapeutic intervention for PTSD (Harvey et al., 2003). As we describe in the "Method" section in greater detail, in HOC the patient develops mastery over anxiety symptoms by being conditioned to associate a pleasant odor with a state of calm. Using olfactory cues, the patient then learns how to cultivate a "safe place" where one can learn to manage one's anxiety and to gain a sense of mastery over fear and stress. In the next phase, the patient is finally able to withstand imaginal exposure to the traumatic memory itself. Finally, the patient, who has learned the role of scent in producing one's symptoms, is able to replace the traumatic olfactory cues with pleasant ones.

In an important controlled study, Brom, Kleber, and Defares (1989) were able to show benefit with hypnosis for PTSD. However, they treated a less chronic population with trauma unrelated to combat. Other treatment studies working with combat-related PTSD have demonstrated the difficulty of obtaining good therapeutic results with this population. A careful study, conducted with Israeli soldiers with chronic PTSD, failed to show improvement following the careful application of individualized and group CBT approaches (Solomon, Bleich, Shoham, Nardi, & Kotler, 1992). We thought that exposure produced in the manner of HOC might lead to more salutary results. Our therapeutic interventions also allow for more individualized approaches than in the earlier study.

We therefore decided to undertake an open study of patients suffering from chronic combat-related PTSD whose condition had not improved with other treatment modalities and who were then treated with HOC.

METHOD

Participants

Participants were drawn from the Posttraumatic Stress Disorder Treatment Unit of the Mental Health Services of the Israel Defense Forces. The PTSD Unit provides multidisciplinary ambulatory care for former and current soldiers who in the course of duty were exposed to combat trauma and developed symptoms of PTSD. The staff includes a psychiatrist, clinical psychologists, and social workers. The PTSD Unit routinely has its clients complete self-assessment scales, including those described below, during two 1.5-hour intake interviews. Most clients receive treatment for up to a year. Inclusion criteria were a diagnosis of chronic combat-related PTSD according to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) criteria (DSM-IV; American Psychiatric Association, 1994), as determined by a semistructured psychiatric interview conducted by a psychiatrist with over 10 years of experience treating PTSD; flashbacks and/or panic attacks triggered by olfactory stimuli; continuing troubling symptoms despite prior attempts at treatment; and, finally, competence and agreement to sign an informed consent. Exclusion criteria included evidence of psychosis, severe traumatic brain injury or postconcussion syndrome, and uncontrolled substance abuse.

All 84 patients receiving treatment and follow-up at the clinic and fulfilling the inclusion criteria were offered a course of psychotherapy with hypnosis, which they were told might help to ameliorate their symptoms and to improve their quality of life. Thirty-seven provided written consent. Participants continued to receive standard treatment at the PTSD Unit for at least 1 year following the HOC. The treatment was conducted between January 2005 and November 2007.

A retrospective assessment of the clinical scales in HOC intervention was approved by the Ethical Committee for Experimentation in Human Subjects of the Israel Defense Forces and by the Israel Ministry of Health.

Interventions

The HOC technique has been described elsewhere ([Abramowitz & Lichtenberg, 2009](#)). Briefly, treatment included six weekly 1.5-hour sessions. In the first session, after a detailed discussion of the nature of hypnosis, the therapist takes a sort of olfactory history from the patient, including a description of any scents that might trigger flashbacks, panic attacks, and other unpleasant reactions. The patient then chooses from a selection of three simple aromatic oils (vanilla, red mandarin, and basil) a vial with a subjectively pleasing odor and, while retrieving pleasant memories and experiences, is taught to associate the scent with a sense of control and calm.

In the second session, the patient, following a hypnotic induction, reexperiences past episodes of successful functioning under stress, for purposes of applying these emotional resources in the “here and now,” and receives posthypnotic suggestions for dealing successfully with the ordeal of frequent flashbacks to the traumatic event.

In the third session, the therapist and patient together choose a carefully detailed safe place, drawn from the memories evoked during the previous session. While hypnotized, the patient practices “entering” the safe place while inhaling the scent chosen in the first session, thereby strengthening the association between the hypnotically conjured safe place and the actual scent.

During the fourth and fifth sessions, the patient, while hypnotized and smelling the pleasant scent, is encouraged to remember the traumatic event, in particular its olfactory characteristics. The therapist reframes the traumatic memory, replacing its olfactory content with the pleasant scent in the hope of moderating the patient’s reactions to the memories. This may be practiced more than a dozen times in the course of these two sessions.

In the final session, the patient practices what he or she has learned and is further taught to use the vial of pleasant-smelling oil to reenter the safe place in situations that trigger anxiety or panic attacks. It is understood that the patient will continue to carry this vial with him or her, as a tool for combating anxiety and hopefully as a substitute for benzodiazepines, which one may have been consuming in stressful situations.

Concurrent pharmacotherapy was not discontinued during the 6 weeks of HOC therapy. Subsequently, the medication and dosages were changed as deemed necessary by the treating psychiatrist, who also performed the hypnotic intervention.

Assessments

Before the first session, basic demographic and clinical data were collected. In addition, at baseline, all subjects underwent testing with the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; [Weitzenhoffer & Hilgard, 1962](#)). In accordance with Israeli law, all hypnosis was performed by a hypnotist with accreditation from the Ministry of Health ([Aviv, Dalia, Gaby, & Kobi, 2008](#)). We used the Hebrew version of the SHSS:C, which showed a total scale correlation of .69 ([Lichtenberg, Shapira, Kalish, & Abramowitz, 2009](#)).

The following clinical assessments, administered in Hebrew, were conducted for each participant at baseline, 6 weeks (i.e., the completion of the six therapy sessions), 6 months, and 1 year:

1. Impact of Events Scale-Revised (IES-R; [Weiss & Marmar, 1997](#)). The IES-R, which served as the primary outcome measure in this study, is a

22-item questionnaire assessing symptoms of intrusion, avoidance, and hyperarousal resulting from exposure to a traumatic event. The subjects, relating to the 7-day period prior to completing the questionnaire, rate answers on a scale of 0 (*not at all*) to 5 (*extremely*). Though we did not find in the research literature criteria for categorizing score changes, we decided that we would rate a 50% reduction in total score as a response to treatment.

2. Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a widely used, 21-item self-completed questionnaire evaluating depressive feelings, attitudes, and symptoms. Item ratings of 0 to 3, in increasing severity, yield a score in the range of 0 to 63. Scores in the range of 10 to 18 suggest a mild-to-moderate depression, 19 to 29 a moderate-to-severe depression, and 30 or above a severe depression.
3. Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986). The potential importance of dissociative phenomena in the development and subsequent symptomatology of PTSD has been alluded to. The DES is a 28-item scale that measures dissociation in both healthy and clinical subjects by requiring the subject to estimate the percentage of time (0 to 100) one experiences a variety of dissociative symptoms. The final score is the mean of the results for all the test items. The DES has produced test-retest reliability scores of .84 and internal reliability scores of .90 (Bernstein & Putnam). A review of the use of the scale in over 100 studies showed mean reliability and convergent validity scores of .93 and .67, respectively (Ijzendoorn & Schuengel, 1996).

All hypnotic assessments were conducted by a single investigator (EGA). The scales used for clinical assessment—the IES-R, BDI, and DES—were all completed by the participants, overseen by staff not involved in the hypnotic treatment and assessment.

Analysis of Data

All statistical tests were two-sided except for the test of the null hypothesis, which was one sided. Categorical variables were presented as a count and percentage with an exact 95% confidence interval when relevant. Continuous variables were summarized by a mean, median, and standard deviation and compared with a *t* test or analysis of variance methodology. The change from baseline over time in the three clinical scales scores (IES-R, BDI, and DES) was modeled by means of repeated measures analysis of variance methods using PROC MIXED in SAS v9.1 (SAS Institute, Cary, NC). In order to test for differences in the slope of change from baseline, time (6 weeks, 6 months, and 12 months) was entered into the model as a continuous variable with baseline value entered as a covariate. To test if the change from baseline was significant per time point, time was entered as a categorical variable

and the least-squares means were evaluated for a significant difference from 0. We tested for effect of the other variables (years after the battle, age, period before HOC, and baseline SHSS:C) by modeling them in the same manner.

RESULTS

Only 1 participant dropped out of the study, after the first session, and was not included in the subsequent analysis. All remaining 36 participants were male, with mean age 41.2 ($SD = 12.2$, range 24–64). The trauma had occurred an average of 16.5 years earlier ($SD = 14.3$, range 1–37). Prior to their enrollment in the HOC treatment protocol, the participants had been in treatment an average of 2.44 years ($SD = 1.3$, range 1–6), including a mean of 1.9 years of antidepressant pharmacotherapy. All patients were receiving treatment with selective serotonin reuptake inhibitors. In addition, 18 (50%) were receiving benzodiazepines and 9 (25%) were taking major tranquilizers (antipsychotics) for help in controlling their symptoms. Baseline clinical assessment showed significant psychopathology, with mean IES–R scores of 77.1 ($SD = 17.4$), mean BDI scores of 30.3 ($SD = 13.1$), and mean DES scores of 47.3 ($SD = 19.9$). The mean score on the SHSS:C assessing hypnotic susceptibility at baseline was 6.31 ($SD = 1.97$).

The results of the three clinical scales are presented in Figure 1. The pattern is similar for all three scales: A clinically and statistically significant reduction in scores was obtained by 6 weeks (the end of the HOC intervention). Mean IES–R at this point was 48.0 ($SD = 25.0$), mean BDI was 18.5 ($SD = 13.9$), and mean DES was 33.7 ($SD = 22.6$). This improvement was maintained at 6 months, mean IES was 46.5 ($SD = 26.1$), mean BDI was 16.7 ($SD = 13.3$), and mean DES was 34.2 ($SD = 24.3$); and at 1 year, mean IES was 43.8 ($SD = 26.1$), mean BDI was 17.5 ($SD = 14.9$), and mean DES was 33.4 ($SD = 23.07$). Of the 36 subjects, 21 (58%) showed a response to treatment, as evidenced by a reduction of 50% or more on IES total score.

Baseline SHSS:C score was shown to have a significant effect on the reductions in clinical scores; a higher baseline SHSS:C correlated with a more pronounced reduction in the scores: for IES–R, $F(1, 31) = 7.14$, $p = .0119$; for BDI, $F(1, 31) = 10.06$, $p = .0034$; and for DES, $F(1, 31) = 3.74$, $p = .0623$. For the least hypnotically susceptible subjects (defined as SHSS:C score ≤ 4 ; $n = 7$), only the IES–R showed a reduction in scores (13.6, $SE = 4.63$; $p = .0065$).

We also found a reduction in use of medication, shown in Table 1: 31% [95% exact binomial CI:(16.3%, 48.1%)] had reduced or discontinued their selective-serotonin reuptake inhibitor medication, 55% [95%

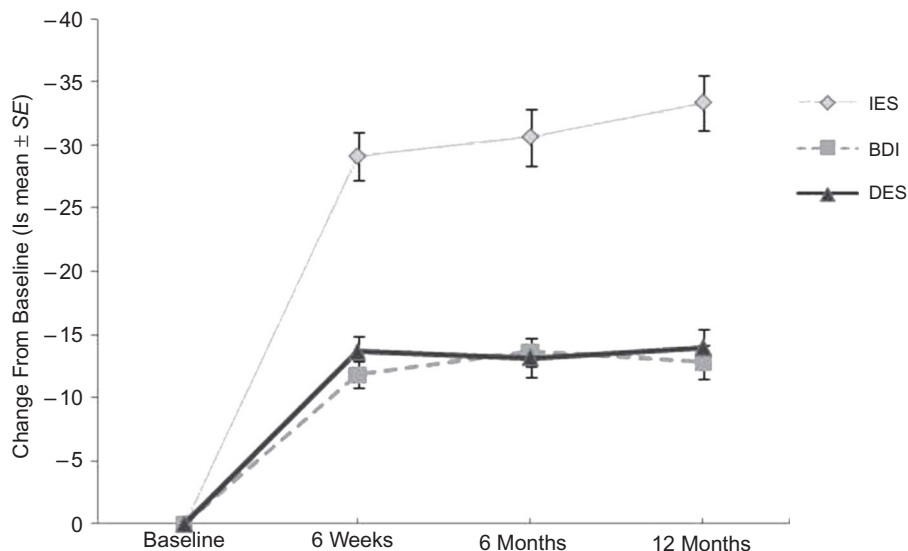


Figure 1. Clinical condition at baseline, end of treatment, and follow-up.

Table 1

Medication Usage at One-Year Follow-Up Compared With Baseline

	<i>n</i> at Baseline	Increased Dosage Equivalent <i>n</i> (%)	Unchanged Dosage Equivalent <i>n</i> (%)	Reduced Dosage Equivalent <i>n</i> (%)	Medication Discontinued <i>n</i> (%)
SSRIs	36	6 (17)	19 (61)	6 (17)	5 (14)
Benzodiazepines	18	0 (0)	0 (0)	8 (44)	10 (56)
Neuroleptics	9	1 (11)	3 (33)	3 (33)	2 (22)

exact binomial CI:(21.2%, 86.3%)] their antipsychotics, and all 100% [95% exact binomial CI:(81.5%,100%)] their benzodiazepines.

Age at time of trauma, the period from the trauma to the HOC treatment, and the period of prior treatment, did not affect treatment outcome.

A significant reduction in all three scales was found after 6 weeks: IES-R, $t = 15.1$, $p < .0001$; BDI, $t = 11.24$, $p < .0001$; and DES, $t = 10.51$, $p < .0001$. At 12 months, the decline continued in the IES-R scale, $F(1, 30) = 14.54$, $p = .0006$, and remained stable in the BDI, $F(1, 30) = 0.19$, $p = .0843$, and DES scales, $F(1, 30) = 0.11$, $p = .7372$.

DISCUSSION

We have presented here the findings of an uncontrolled open study of a new form of hypnotic intervention for chronic, combat-related PTSD with olfactory components. We found that at the end of six weekly sessions, 36 active and discharged soldiers, who had suffered for years from symptoms of their disorder and had remained symptomatic after undergoing other treatments, responded to the therapy with significant reductions in their psychopathology, as determined by measures of posttraumatic, depressive, and dissociative symptomatology.

We used a population screened for PTSD who suffered from dissociative or anxiety reactions following olfactory stimuli. This is common in soldiers with combat-related PTSD, where the smells, produced for example by explosions and burning flesh, can be elements of the traumatic event and may play an important role in triggering flashbacks, dissociative states, and panic attacks. The degree to which this form of therapy may be usefully applied to PTSD following traumatic events without olfactory components, or to anxiety disorders in general, needs to be investigated separately. We have reported elsewhere the successful application of HOC in the treatment of a simple phobia and panic disorder, neither of which was related to olfactory stimuli ([Abramowitz & Lichtenberg, 2009](#)).

While olfactory stimuli have been used in the context of aversive behavioral therapy to alter patterns of deviant sexuality ([Laws, 2001](#)) and of overeating ([Cole & Bond, 1983](#)), this is to our knowledge the first attempt to exploit olfactory stimuli in working with combat-related PTSD.

Beyond the elements of CBT, HOC attempts to harness through hypnosis the potent psychological and neurophysiological link between olfaction, emotion, and memory by reframing the traumatic memory and replacing the elements that formerly provoked flashbacks and dissociative states with scents that usher the patient into a calm, secure, and safe place. The improvement in symptomatology and the marked reduction in use of psychotropic medication suggest that this intervention was effective.

This was an open and uncontrolled trial, which obviously limits the certainty with which we can draw conclusions about the efficacy of HOC. Moreover, the therapist administering the HOC intervention was also the treating psychiatrist determining medications and dosages. Nevertheless, our findings are highly suggestive that HOC can be of value in the treatment of chronic combat-related PTSD. First of all, the treatment population had been unresponsive to a variety of treatment modalities provided for significant periods of time. Any treatment capable of producing this degree of improvement for chronic PTSD,

a disorder often refractory to treatment, deserves further investigation. Second, our follow-up lasted for 1 year, far longer than most treatment intervention studies in PTSD. This allowed us to see that the improvement was maintained for a year, suggesting strongly that the clinical gains accruing to PTSD sufferers treated with HOC are longstanding. Finally, the positive correlation between baseline hypnotizability scores and improvement in clinical assessment scores suggests that the hypnotic intervention was indeed related to the favorable clinical outcome.

HOC was found effective regardless of age of patient and duration of disorder. This is encouraging; though the technique's effectiveness needs to be assessed in a still wider range of ages and of course in women as well.

PTSD sufferers may be more highly hypnotizable than the general population (Bryant et al., 2003; D. Spiegel, Hunt, & Dondershire, 1988). The average hypnotizability score on the SHSS:C in this study of individuals with PTSD ($M = 6.31$) appears to be higher than that reported for the general Israeli population ($M = 5.62$; Solomon et al., 1992). Higher hypnotizability predicted a better response to treatment with HOC, though low hypnotizables also showed evidence of improvement in their posttraumatic psychopathology. An initial assessment of hypnotizability may be useful for anticipating the benefit to be gained from this treatment.

Our findings are strongly suggestive that HOC is of therapeutic value in treating chronic sufferers of combat-related PTSD. Subsequent studies should incorporate a randomized control group of PTSD patients. The control group may receive a proven intervention, such as CBT. Alternatively, both groups might receive CBT, while one group receives HOC adjuvant therapy as well.

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Eine neue Hypnosetechnik für die Behandlung gefechtsbezogener Posttraumatischer Belastungsstörung

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Zusammenfassung: Viele Kriegsveteranen mit Posttraumatischer Belastungsstörung haben eine olfaktorische Komponente in ihrem Traumagedächtnis. Diese könnte durch die Technik des hypnotherapeutischen olfaktorischen Konditionierens (HOC) nutzbar gemacht werden. 36 Patienten mit chronischer PTSD (wiederkehrend olfaktorisch induzierten Flashbacks) wurden mit 6*1.5-Stunden Hypnoseseitzungen behandelt. Als abhängige Variablen wurden die revised Impact of Events Scale, das Beck Depression Inventory und die Dissociative Experiences Scale verwendet. Signifikante Reduktionen der Symptomatologie wurden am Ende der 6-wöchigen Behandlung sowohl für die IES-R als auch für das Beck Depression Inventory und die Dissociative Experiences Scale beobachtet; 21 (58%) der Teilnehmer reagierten auf die Behandlung mit einer Reduktion von 50% oder mehr auf der IES-R. Die Verbesserung konnte bei den 6- und 12-Monat Nachfolgeuntersuchungen aufrechterhalten werden. HOC hat das Potenzial zur Behandlung von PTSD mit olfaktorischen Komponenten beizutragen.

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Une nouvelle technique hypnotique pour le traitement du de syndrome de stress post-traumatique lié au combat: Une étude ouverte prospective

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Résumé: Les souvenirs traumatisants de nombreux vétérans souffrant du syndrome de stress post-traumatique (SSPT) comportent une composante olfactive pouvant être utilisée selon une technique appelée « conditionnement olfactif hypnothérapeutique » (COH). Trente-six patients externes souffrant d'un SSPT chronique, avec flashbacks résistants provoqués par stimulation olfactive, ont été traités à l'aide de six séances d'hypnose de une heure et demie chacune. Pour mesurer leurs résultats, les auteurs ont utilisé l'Échelle (révisée) des répercussions d'un événement (ERE-R), l'Inventaire de dépression de Beck et l'Échelle d'expériences dissociatives. Une réduction significative des symptômes a été enregistrée à la fin de la période de traitement de six semaines avec l'ERE-R ainsi qu'avec l'Inventaire de dépression de Beck et l'Échelle d'expérience dissociative. Vingt-et-un sujets (58%) ont répondu au traitement par une réduction d'au moins la moitié de leurs symptômes sur l'ERE-R. Cette amélioration s'était maintenue aux suivis de 6 mois et de 12 mois. L'usage de médicaments a été réduite. Le COH montre un effet positif potentiel dans le soulagement des personnes souffrant de SSPT avec composante olfactive.

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Una nueva técnica de hipnosis para tratar el trastorno por estrés postraumático relacionado con el combate: Un estudio prospectivo y abierto

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Resumen: Muchos de los veteranos de guerra con TEPT tienen un componente olfativo a sus recuerdos traumáticos que puede ser utilizado por una técnica hipnoterapéutica de condicionamiento olfativo (HCO). Tratamos a 36 pacientes ambulatorios con TEPT crónico con flashbacks resistentes inducidos olfativamente con 6 sesiones de 1.5 horas usando hipnosis. Utilizamos la Escala de Impacto del Evento Revisada (IES-R), el Inventario de Depresión de Beck, y la Escala de Experiencias Disociativas como medidas de resultado. Observamos reducciones significativas de la sintomatología al finalizar el período de 6 semanas de tratamiento en el IES-R, así como en el Inventario de Depresión de Beck y la Escala de Experiencias Disociativas; 21 (58%) de los participantes respondieron al tratamiento con una reducción del 50% o más en el IES-R. La mejoría se mantuvo en seguimientos a los 6 meses y 1 año. El uso de medicamentos se redujo. El HCO muestra el potencial de proporcionar beneficios a las personas que sufren de TEPT con componentes olfativos.

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