



SHORT COMMUNICATION



Adjunct psychomotor trauma exposure in the treatment of post-traumatic stress disorder: a case series

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ABSTRACT

Introduction: Psychotraumatic disorders, particularly post-traumatic stress disorder (PTSD), have been a major public health issue for many years. However, many patients remain resistant to treatment, with significant levels of residual symptoms, a high dropout rate, and poor functional prognosis despite a reduction in psychotraumatic symptoms. The physical impact of trauma might influence treatment response. We have developed an integrative method for patients suffering from post-traumatic stress disorder (PTSD). In this study, we report the cases of 16 successive patients with PTSD treated with adjunct psychomotor trauma exposure.

Methods: The data were collected retrospectively from the clinical records of subjects treated with adjunct psychomotor exposure therapy at the Hauts-de-France Regional Center for Psychotrauma. Severity of psychotrauma was reported using PCL-5 before and one month after treatment.

Results: A decrease in PCL-5 score was seen in all participants between baseline (45.6 ± 11.6) at the end of treatment (16.6 ± 10.1) ($p < .001$).

Conclusion: Adjunct psychomotor exposure therapy is a promising tool for the treatment of PTSD. Future high-quality randomised controlled trials are necessary.

Exposición psicomotora complementaria en trauma en el tratamiento del trastorno de estrés postraumático: una serie de casos

Introducción: Los trastornos psicotraumáticos, particularmente el trastorno de estrés postraumático (TEPT), han sido un importante problema de salud mental por muchos años. Sin embargo, muchos pacientes siguen siendo resistentes al tratamiento, con niveles significativos de síntomas residuales, una tasa de abandono alta y un mal pronóstico funcional a pesar de una disminución en los síntomas psicotraumáticos. El impacto físico del trauma podría influir la respuesta al tratamiento. Nosotros hemos desarrollado un método integrativo para pacientes que sufren de trastorno de estrés postraumático (TEPT). En este estudio, reportamos 16 casos de pacientes sucesivos con TEPT tratados con exposición psicomotora complementaria en trauma.

Métodos: Los datos se recolectaron retrospectivamente de los registros clínicos de sujetos tratados con terapia de exposición psicomotora complementaria en el Centro Regional de Psicotrauma de Hauts-de-France. La gravedad del psicotrauma se informó utilizando el PCL-5 antes y un mes después del tratamiento.

Resultados: Se observó una disminución de la puntuación en el PCL-5 en todos los participantes entre el nivel basal (45.6 ± 11.6) y el final del tratamiento (16.6 ± 10.1) ($p < .001$).

Conclusión: La terapia de exposición psicomotora complementaria es una herramienta prometedora para el tratamiento del TEPT. Se necesitan estudios controlados aleatorizados de alta calidad en el futuro.

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HIGHLIGHTS

- We have developed an integrative method for patients suffering from post-traumatic stress disorder.
- In this study, we report the cases of 16 successive patients with PTSD treated with adjunct psychomotor trauma exposure.
- A decrease in PCL-5 score was seen in all participants between baseline and the end of treatment.

1. Introduction

Psychotraumatic disorders, particularly post-traumatic stress disorder (PTSD), have been a major public health issue for many years, with a significant impact on the quality of life of individuals who have

experienced psychotrauma, as well as on societal costs (Vaiva et al., 2008). Exposure therapy combined with cognitive-behavioral therapy has shown good efficacy in treating psychotrauma (Jericho et al., 2022). However, many patients remain resistant to

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treatment, with significant levels of residual symptoms (Imel et al., 2013), a high dropout rate, and poor functional prognosis despite a reduction in psychotraumatic symptoms (Bonfils et al., 2022).

Therefore, augmentation strategies are needed and have been implemented to try to address these concerns and increase engagement and responsiveness to treatment. Augmentation strategies primarily aim to either enhance learning or enhance the tolerability of prolonged exposure (PE) treatment. Several augmentation strategies have shown interesting results, using different pathways (Bird et al., 2024). One of the proposed strategies is to activate the sympathetic nervous system. In particular, aerobic exercise showed a greater reduction in symptomatology at 6 months, compared with a stretching group (Bryant et al., 2023). Other treatments, such as yohimbine, have been proposed without showing statistically significant efficacy.

Activating the fear network has also shown promising results: therapy augmented with hydrocortisone (Yehuda et al., 2015), repeated transcranial magnetic stimulation (Thierrée et al., 2022), MDMA (Mitchell et al., 2021), or ketamine. Finally, other methods proposed to increase brain plasticity: augmentation with D-cycloserine (Rosenfield et al., 2019), methylene blue (Zoellner et al., 2017), propranolol (Brunet et al., 2018; Roulet et al., 2021), cannabinoids or vagal nerve stimulation.

Improving treatment tolerance has also been targeted (Bird et al., 2024): administration of quetiapine, stellate ganglion block, improvement of social support in therapy, oxytocin administration. Moreover, regulation strategies before exposure therapy, such as STAIR (skills training in affect and interpersonal regulation) has shown positive results in an RCT (Cloitre et al., 2010) to augment to effects of (modified) exposure therapy (PE). Although several of these approaches are showing promising results, larger-scale and/or replication studies are still needed at this stage. Alongside these augmentation therapies, new approaches focusing on the bodily consequences of psychotrauma could improve the effectiveness of treatment.

The physical impact of trauma might indeed influence treatment response. Research on this topic have been growing in interest this last years (including yoga, somatic experiencing, and sensorimotor therapy) (Brom et al., 2017; Classen et al., 2021; van der Kolk et al., 2014). Although we are beginning to understand the lasting effects of trauma on the body, little is known about effective body-focused interventions, especially when combined with trauma focused psychotherapy. In this context, we have developed an integrative and multimodal method for patients suffering from PTSD, combining PE with a psychomotor trauma exposure (PTE) protocol. This approach includes two steps (psychomotor body scan and

psychomotor trauma exposure). In this study, we report the cases of 16 successive patients with PTSD treated with adjunct PTE.

2. Methods

2.1. Participants

This study received approval from the Commission Nationale de l'Informatique et des Libertés (CNIL) and the Local Data Protection Service (DEC22-004).

The data were collected retrospectively from the clinical records of subjects treated with psychomotricity at the Hauts-de-France Regional Center for Psychotrauma between November 2020 and August 2024. We only included records from patients presenting a PTSD diagnosis according to DSM-5, with stable pharmacotherapeutic treatment for at least 4 weeks at the beginning of the treatment, and no changes during the study. No individuals received psychotherapy in the 4 weeks prior to the beginning of the study. No participants had a history of psychosis, mania, active alcohol or drug use disorder. No pregnant women were included.

2.2. Design

All participants had PTE protocol, in parallel with PE sessions, sequentially (i.e. after the prolonged exposure therapy was completed), or in double exposure (i.e. both imaginal and PTE combined in the same session). The number of sessions was adapted according to the response to treatment. In particular, treatment was interrupted before the end of the 12 psychomotricity sessions when response was judged to be very good.

2.3. PE therapy

PE has been previously described (Foa et al., 2019). PE targets psychological mechanisms that maintain PTSD and includes a treatment rationale, psychoeducation about trauma, diaphragmatic breathing, imaginal exposure, in vivo exposure, and processing of the trauma.

2.4. PTE protocol

This psychomotricity-based therapeutic modality has been inspired by the PE therapy protocol (Foa et al., 2019), but it specifically focuses on the bodily dimensions of post-traumatic symptomatology. It aims to enable multimodal exposure by rehabilitating the affected body areas (Supplementary data 1).

The procedure is subdivided into 3 phases:

Phase 1: Evaluation of Sensory Impact: changes in bodily sensations post-trauma, perception of body parts, triggers of re-experiencing, postural difficulties,

physical contact, impact on intimacy/sexuality, showing difficulties, urination/defecation difficulties, changes in dressing, spatial orientation difficulties, and specific sensory evaluation.

Phase 2: Psychomotor Body Scan. Assessment of the 'traumatic bodily imprint': sensitivity, 'traumatic zones', dissociation.

Phase 3: Psychomotor trauma Exposure. Psychomotor trauma exposure aims to help the patient reconnect with the physical sensations associated with their traumatic experience for desensitisation purposes. Just as patients are exposed to traumatic memories in trauma-focused cognitive-behavioral therapy, they are also exposed to traumatic sensations in parallel. This approach differs fundamentally from traditional body-based therapies and does not include mindfulness techniques. The exposure plan is established based on the psychomotor body scan. The goal is to re-secure the body as a whole by targeting the three dimensions assessed previously: sensitivity, 'Traumatic Zones' and dissociation.

Sessions 1 & 2: introduction to psychomotor trauma exposure + psychomotor body scan.

Sessions 3–7: psychomotor trauma exposure + possible in vivo exposure.

Sessions 7–11: psychomotor trauma exposure + in vivo exposure.

Session 12: re-evaluation of traumatic bodily imprint.

2.5. Assessment

PCL-5. The PCL-5 (Blevins et al., 2015) scale was administered before the treatment and one month after the completion of the treatment. It measures the severity of psychotraumatic symptomatology.

2.6. Statistics

Pre- and post-treatment comparisons were performed with the Wilcoxon test for matched samples.

3. Results

Baseline demographic and clinical variables (Table 1).

All participants (12 (75%) complex PTSD and 4 (25%) PTSD) completed the treatment. The patients were predominantly female (87.5%). The trauma index was mainly sexual (68.8%), physical trauma (18.8%), road traffic accidents (6.3%), and traumatic bereavement (6.3%). Mean age at trauma index was 24.6 \pm 10.6. 8 patients (50%), had one traumatic event, one (6.3%) had 2 traumatic event, and 7 (43.8%) had more than 3 events. Four patients had a history of suicide attempts, one of attention deficit hyperactivity disorder and one had a history of an eating disorder. The average age was 28.5 \pm 9.8 years.

Table 1. Baseline demographic and clinical information. Symptom changes after PTE treatment (mean \pm SD).

Age, years \pm SD	28.5 \pm 9.8		
Sex ratio, Female / Male	14 / 2		
Trauma index (%)			
Sexual	11 (68.8)		
Physical	3 (18.8)		
Road traffic accident	1 (6.3)		
Traumatic bereavement	1 (6.3)		
Age at trauma index \pm sd	24.6 \pm 10.6		
Type of trauma (%)			
PTSD	4 (25)		
Complex PTSD	12 (75)		
Nombre of trauma (%)			
1	8 (50)		
2	1 (6.3)		
>3	7 (43.8)		
Psychotropic drugs, number of patients (%)			
SSRI or SNRI	7 (43.8)		
Prazosin	2 (12.5)		
Number of psychomotor consultation \pm sd	11.3 \pm 5.2		
Number of psychomotor trauma exposure sessions \pm sd	7.4 \pm 3		
Number of prolonged exposure sessions \pm sd	7.5 \pm 3.2		
	Pre tDCS	Post tDCS	<i>p</i>
Baseline Post-traumatic stress disorder, PCL-5 score \pm SD	45.6 \pm 11.6	16.6 \pm 10.1	<.001

Note: Posttraumatic stress disorder was measured with the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). Selective serotonin reuptake inhibitors (SSRI). Selective serotonin reuptake inhibitors (SNRI).

Regarding psychomotricity, the total number of consultations, including evaluation sessions, was 11.3 \pm 5.2, of which 7.4 \pm 3 were specifically PTE sessions. The number of prolonged exposure sessions was 7.5 \pm 3.2. Concerning treatments, 7 (43.8%) were taking antidepressants, 2 prazosine (12.5%).

A decrease in PCL-5 score was seen in all participants between baseline (45.6 \pm 11.6) at the end of treatment (16.6 \pm 10.1) (p < .001). Eight patients (50%) received PTE sessions in parallel with prolonged exposure sessions, four (25%) sequentially, two (12.5%) in double exposure, and two (12.5%) in isolation. The reduction in the PCL-5 score was not significantly different between these procedures.

4. Discussion

This proof-of-concept study demonstrated a significant improvement in psychotraumatic symptoms following the implementation of psychomotor exposure therapy as an adjunct to exposure therapy. This improvement did not differ based on the mode of body-focused exposure (parallel, double, sequential, or isolated). A comparison of these different procedures should be explored further to determine which might be the most effective. Moreover, as the mode of body-focused exposure was not standardised in this naturalistic case series study based on the specifics of each patient and the therapist's preference, it was not designed to compare the effectiveness of PE compared to a modified version using PTE. The

benefit of this adjunct intervention above and beyond the effects of PE would need to be determined in a future randomised controlled trial study.

This study is based on strong pathophysiological hypotheses. Indeed, certain ascending pathways that originate in bodily sensations, categorised as bottom-up, have emerged as playing a significant role in the symptomatology of PTSD. Positive or negative reinforcements of these pathways have been associated with PTSD symptomatology (Kearney & Lanius, 2022). These theories suggest that a disconnection between the body and mind might contribute to the development of PTSD via somatosensory pathways.

The clinical data we currently have support a close and bidirectional link between bodily sensations and post-traumatic symptomatology. Certain body areas act as 'trigger zones' that elicit flashbacks and/or dissociative symptoms through sensory impairments identified in PTSD. These findings are corroborated by several clinical studies. First, distress related to body image is significantly correlated with the severity of post-traumatic symptoms (Weaver et al., 2007). Additionally, sexual symptoms in individuals who experienced childhood sexual abuse are mediated by post-traumatic symptomatology, particularly dissociative amnesia, visual intrusions, and physical reactions to trauma reminders (Kratzer et al., 2022). Despite the consideration of bodily aspects in psychotherapy, current trauma-focused psychotherapies do not utilise ascending pathways, as they do not incorporate direct bodily stimulation. One hypothesis is that addressing these pathways, in addition to traditional therapies, could enhance treatment efficacy and reduce treatment resistance.

Regarding psychomotricity, a recent study (Classen et al., 2021) developed a very different sensorimotor approach in a pilot randomised trial that focused on building basic skills for observing environmental signals on the body, mindfulness, and bodily strategies for managing flashback triggers. The results were positive for anxiety but not for psychotraumatic symptomatology. In this context, it seems valuable to develop different body-based approaches, focusing on bodily exposure in parallel with the imaginal exposure typically offered in trauma-focused psychotherapies.

Even though the addition of PTE appears to increase the effect size of PE ($d = 1.8$ vs 1.38 (Watts et al., 2013)), it should be interpreted with caution given the small sample size and lack of a control group. Moreover, we don't have data about sustained effect after discontinuation of procedure, and future studies with follow-up would be needed.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Data will be available on request.

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