



CASE REPORT



Trauma exposure therapy in a pregnant woman suffering from complex posttraumatic stress disorder after childhood sexual abuse: risk or benefit?

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ABSTRACT

Background: Mental disorders during pregnancy are common and affect the health of mother and child. Despite a relatively high prevalence rate, treatment options have not been investigated systematically. Particularly symptoms of posttraumatic stress disorder (PTSD) may increase significantly during the course of pregnancy. However, proper guidelines for psychotherapeutic treatment of PTSD during pregnancy do not exist.

Objective: In this article, we aimed at discussing the effects of untreated PTSD on pregnancy and postpartum mother-child bonding as well as exposure therapy during pregnancy.

Method: To do so, we present the case of a pregnant woman with complex PTSD following childhood sexual abuse. At the time of hospitalization, the patient was pregnant in the second trimester and reported intrusive re-experiencing of the traumatic events, nightmares, anxiety and helplessness as well as an impairing level of irritability during social situations. After a careful discussion of the case within our department and at the annual conference of the German Association of Psychiatry, Psychotherapy and Psychosomatics, we decided to treat the patient with dialectical behavior therapy for PTSD (DBT-PTSD) including exposure therapy under the regular observation of a gynecologist. Psychometric measurements (Davidson Trauma Scale (DTS) and Borderline Symptom-List-23 (BSL-23)) were used to observe the course of treatment regarding common PTSD-symptoms and disturbances in self-organization (DSO).

Results: The intensity of intrusions and hyperarousal increased from the date of admission, reached the maximum when exposure started and decreased below baseline-level at the end of treatment. Avoidance behavior continually decreased from the beginning until the end of therapy. Decreased BSL-23 values show major improvements regarding DSO. To our knowledge, the course of pregnancy was not affected by treatment-induced psychological and physical symptoms.

Conclusions: DBT-PTSD is a potential treatment option for patients suffering from PTSD during pregnancy. Yet, further (epigenetic) research in this field is urgently needed.

Terapia de exposición al trauma en una mujer embarazada que sufre un trastorno de estrés postraumático complejo después del abuso sexual infantil: ¿riesgo o beneficio?

Antecedentes: Los trastornos mentales durante el embarazo son frecuentes y afectan la salud de la madre y el niño. A pesar de las relativamente altas tasas de prevalencia, las opciones de tratamiento aún no han sido investigadas sistemáticamente. Particularmente los síntomas de trastorno de estrés postraumático (TEPT) pueden aumentar significativamente durante el embarazo. Sin embargo, no existen guías adecuadas de tratamientos psicoterapéuticos para el TEPT durante el embarazo.

Objetivo: En este artículo, nuestro objetivo fue discutir los efectos del TEPT no tratado en el embarazo y el vínculo madre-hijo postparto, así como la terapia de exposición durante el embarazo.

Método: Para ello, presentamos el caso de una mujer embarazada con TEPT complejo por un abuso sexual en su infancia. Al momento de la hospitalización, la paciente estaba cursando su segundo trimestre de embarazo y reportaba re-experimentación intrusiva de los eventos traumáticos, pesadillas, ansiedad y desesperanza así como también empeoramiento de los niveles de irritabilidad en situaciones sociales. Tras una discusión cuidadosa del caso en nuestro departamento y en la reunión anual de la Asociación Alemana de Psiquiatría, Psicoterapia y Psicopatología, decidimos tratar a la paciente con terapia dialéctica conductual para TEPT (DBT-TEPT) incluida la terapia de exposición bajo observación regular de un ginecólogo. Se usaron medidas psicométricas (la Escala de Trauma de Davidson (DTS) y la Lista de síntomas Borderline-23 (BSL-23)) para observar el curso del tratamiento con respecto a los síntomas comunes de TEPT y las alteraciones en la auto-organización (DSO).

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PALABRAS CLAVE

Terapia de exposición al trauma durante el embarazo; trastorno de estrés postraumático complejo; terapia dialéctica conductual centrada en el trauma; efectos transgeneracionales del TEPT; efectos transgeneracionales inducidos por el tratamiento

关键词

妊娠期创伤暴露疗法; 复杂性创伤后应激障碍; 聚焦创伤的辩证行为疗法; PTSD的跨代效应; 治疗引起的跨代效应

HIGHLIGHTS

- Exposure-based DBT-PTSD is a potential treatment option during pregnancy.
- Within this context, exposure-induced psychological distress and its potential (epigenetic) effects on the unborn child should be considered.
- On the other hand, the risk of impaired postpartum mother-child bonding due to untreated PTSD symptoms has to be taken into account.
- Future research should focus on case-control studies to investigate transgenerational epigenetic changes in mothers and their children with regard to long-term child development.

Resultados: La intensidad de las intrusiones e hiperalerta aumentaron desde el ingreso, alcanzando un máximo cuando la exposición comenzó y disminuyeron bajo el nivel basal al final del tratamiento. La conducta evitativa disminuyó continuamente desde el inicio hasta el final de la terapia. Los valores disminuidos del BSL-23 muestran una mejoría importante en relación a la DSO. Hasta donde, el curso del embarazo no se afectó por los síntomas psicológicos y físicos inducidos por el tratamiento.

Conclusiones: La DBT-TEPT es una opción de tratamiento potencial para pacientes que sufren de TEPT durante el embarazo. Sin embargo, se necesitan con urgencia más investigaciones (epigenéticas) en este campo.

创伤暴露疗法应用于一位遭受童年期性虐待后患上复杂性创伤后应激障碍的孕妇：风险还是收益？

背景： 妊娠期间精神障碍很常见，会影响母子健康。尽管患病率较高，尚未对治疗方案进行系统性考查。特别是创伤后应激障碍（PTSD）症状在妊娠过程中可能会明显增加。但是，还没有对于妊娠期PTSD心理治疗的适当指导。

目的： 在本文中，我们旨在探讨未经治疗的PTSD对妊娠和产后母婴连结以及妊娠期暴露疗法的影响。

方法： 为此，我们介绍了一位遭受童年期性虐待后患上复杂性PTSD的孕妇的病例。住院期间，患者处于妊娠中期，报告了创伤性事件的闯入性再体验、噩梦、焦虑和无助感以及社交情况下损害性水平的易激惹。在我们部门内部以及德国精神病学、心理治疗和心身医学协会的年会上对该病例进行了认真讨论之后，我们决定在妇科医生的常规观察下使用PTSD辩证行为疗法（DBT-PTSD）治疗该患者。心理测量（戴维森创伤量表（DTS）和边缘性症状列表-23（BSL-23））用于考查常见PTSD症状和自组织障碍（DSO）相关治疗过程。

结果： 闯入和高唤起的强度从入院之日起开始增加，暴露开始时达到最大，治疗结束时下降到基线水平以下。从治疗开始到结束，回避行为持续下降。降低的BSL-23分值表明DSO有了重大改进。据我们所知，妊娠过程不受治疗引起的心理和身体症状的影响。

结论： DBT-PTSD是妊娠期PTSD患者的潜在治疗选择。然而，迫切需要在此领域中进行进一步（表观遗传）研究。

关键词： 妊娠期创伤暴露疗法；复杂性创伤后应激障碍；聚焦创伤的辩证行为疗法；PTSD的跨代效应；治疗引起的跨代效应

1. Introduction

To date, despite a relatively high prevalence rate, the treatment of mental disorders during pregnancy, which presumably affect the health of both mother and child, has not been investigated systematically (Costa, Souza, Pedroso, & Strufaldi, 2018; Jha, Salve, Goswami, Sagar, & Kant, 2018). Women with risk factors, such as previous mental disorders or an increased number of stressful or traumatic life experiences, are at particular risk to develop psychiatric symptoms during pregnancy (Vesga-Lopez et al., 2008). Onoye et al. (2013) investigated longitudinal changes in mental health during pregnancy and found that while depression and anxiety symptoms remained stable over the course of pregnancy, general stress and symptoms of Posttraumatic stress disorder (PTSD) increased significantly during the third trimester. Furthermore, maternal mental illness and associated factors of psychological distress during pregnancy are linked to serious effects on child development including preterm birth and low birth weight (Schetter & Tanner, 2012).

Moreover, symptoms of untreated PTSD present a high risk factor for postpartum depression and are likely to impair mother-child bonding. Impaired postpartum bonding has been shown to be related to severe deficits regarding the socioemotional development of the child and hence increase the vulnerability to develop psychiatric disorders later on in life. Interestingly, there are hints that mental illnesses which relate to

unresolved childhood trauma of the mother herself seem to have the highest impact on disturbed dyadic interaction after delivery and, accordingly, the attachment style of the child (Dubber, Reck, Muller, & Gawlik, 2015). Moreover, there is evidence that mothers with untreated difficulties in emotion regulation, present a risk factor for neglect as well as physical and sexual abuse in their own children (Clemens, Berthold, Fegert, & Kolch, 2018).

There are in fact hints that the transgenerational effects of traumatization even include biomolecular changes. There is, for example, discrete evidence that consequences of traumatization have an outlasting effect on the next generation in terms of transgenerational epigenetic transmission by means of differentiated DNA methylation (Mulligan, D'Errico, Stees, & Hughes, 2012; Perroud et al., 2014). Despite these findings and a high prevalence rate of PTSD (Khoramroudi, 2018), proper guidelines for psychotherapeutic treatment during pregnancy do not exist.

For example, the German S3-Guidelines merely state that stabilization techniques are to be given preference (Flatten et al., 2011). Surely, exposure-based treatments are associated with increased stress and initial worsening of symptoms during the course of treatment (American Psychological Association, 2017; Flatten et al., 2011), but further details are lacking regarding the circumstances under which it might still be beneficial to implement exposure-based treatment methods

or whether there are critical time periods during pregnancy with respect to child development. In this context, the investigation of a treatment approach for PTSD during pregnancy seems of high relevance.

Here, the authors present the case of a pregnant woman suffering from complex PTSD (cPTSD) after childhood sexual abuse (CSA) who underwent a 12-week exposure-based dialectical behaviour therapy for PTSD (DBT-PTSD) (Bohus, Dyer, et al., 2013) at the University Hospital of Tuebingen. Effects of PTSD symptoms on the mental and physical health of mother and child during pregnancy and the consequences of exposure-based treatments are discussed.

2. Case presentation and methods

Mrs S. was a 25-year-old married Caucasian woman when she presented herself the first time to us at the clinic's trauma consultation centre for a preliminary examination, without previous psychotherapeutic treatment. The pregnant woman (13th week of gestation) already had a two-year-old daughter. At the time of hospitalization, Mrs S. was pregnant in the 21st week of pregnancy.

She had suffered from symptoms like intrusions, nightmares and irritability in social situations for a long time following CSA by a close relative between the age of five and ten as well as a substantial emotional neglect by her mother. Furthermore, she showed distinct avoidance behaviour in an effort to try to maintain a minimum of emotional stability and functionality.

Her initial childhood traumatic experiences were reactivated when an unknown person touched her from behind about two months ago. As she was worried about being unable to take appropriate care of her two children after the birth of the second one, she requested cue-exposure therapy before delivery. During a careful examination, we found that she fulfilled the criteria for cPTSD according to ICD-11 (international classification of diseases 11th revision; 1) (Maercker, Brewin, Bryant, Cloitre, Reed, et al., 2013; Maercker, Brewin, Bryant, Cloitre, van Ommeren, et al., 2013; Maercker, Hecker, Augsburger, & Kliem, 2018).

In ICD-11, the diagnosis of cPTSD is defined by disturbances in self-organization (DSO) by means of affective dysregulation, impulsivity and negative self-concept as well as disturbances in relationships to others in addition to the classical PTSD symptom cluster (Karatzias et al., 2017). In this regard, particularly overwhelming, long-lasting, reoccurring traumatic experiences during childhood, such as sexual abuse, are considered a risk factor for the development of cPTSD (de Aquino Ferreira, Queiroz Pereira, Neri Benevides, & Aguiar Melo, 2018).

Besides the core criteria of PTSD, DSO were seen through difficulties in appropriate regulation of trauma-related emotions such as anxiety, anger and

intense feelings of helplessness, as well as an increased and impairing level of fear and irritability in social situations. The sexual relationship with her husband was severely impaired. Furthermore, the patient was burdened by her negative self-concept as a bad mother. Apart from the cPTSD diagnosis, she did not fulfil the complete criteria for any other mental disorder.

In advance of the in-patient admission to our 12-week exposure-based DBT-PTSD program (Bohus, Dyer, et al., 2013), her gynaecologist was consulted and an individual risk-benefit-assessment was conducted (for more details please refer to the discussion). Mrs S. started her treatment when she was pregnant during the second trimester (21st week of pregnancy). Her gynaecologist routinely observed the course of pregnancy during the whole course of the treatment without reporting any serious adverse events. Psychometric measurements Davidson Trauma Scale (DTS) and Borderline Symptom-List-23 (BSL-23) were used to observe the course of treatment regarding common PTSD-symptoms and DSO. The Davidson Trauma Scale (DTS) is a 17-Item self-rating scale with a good internal as well as retest reliability and validity, measuring PTSD symptom severity in terms of trauma-related re-experiencing, avoidance behaviour and hyperarousal (Davidson et al., 1997). **For the single items**, scores between 0 and 1 point to asymptomatic or low symptom severity, scores around 2 point to moderate symptom severity and scores between 3 and 4 to high or very high symptom severity. Further, the test retest reliability is reported to be $r = 0.86$. According to Davidson, Tharwani, & Connor (2002), the distribution in a normative general population has been found to be at mean (SD) = 11.0 (18.1).

Statistically reliable changes regarding symptom improvement over the time course of therapy were examined by means of the reliable change index (RCI) as suggested by, for example, Jacobson & Truax, (1991). Thus RCI was calculated using the reported test-retest reliability as well as the SD of the normative population as

$$RCI = (pre - post) \div \sqrt{2 \times (SD \times \sqrt{1 - r})^2},$$

whereby *pre* represented the total sum score of the DTS at the beginning of treatment (week of pregnancy 21) and *post* represented the total sum score at the end of treatment (week of pregnancy 31). According to Jacobson, the cut-off value for RCI was set to 1.96.

The BSL-23 is also a self-rating instrument, with a range from 0 (symptoms absent) to 4 (symptoms clearly present), examining symptoms, which are typically increased in patients with Borderline personality disorder (BPD) such as emotional dysregulation, and negative

thoughts and feelings about oneself and others (Bohus, Limberger, et al., 2007), and was therefore used to assess DSO-related impairments. For BPD patients, the average score is known to be around mean (SD) = 2 (0.76), whereas healthy controls score around mean (SD) = 0.4 (0.22). Again, the internal as well as retest reliability has been judged as high (Bohus, Limberger, et al., 2007). Furthermore, the change-sensitivity has been rated as highly significant ($p < 0.0001$) (Wolf et al., 2009).

To address a particular group of patients suffering from core PTSD symptoms and severe impairments of DSO, DBT-PTSD was developed (Bohus, Dyer, et al., 2013). This treatment option is based on the dialectical principles of standard DBT focussing on mindfulness, distress tolerance, emotion regulation and interpersonal effectiveness (Linehan et al., 2015). Seven treatment phases characterize DBT-PTSD (commitment, trauma-model and motivation, skills and cognitive elements, skills-assisted exposure, radical acceptance, a life worth living, and farewell) (Bohus, Dyer, 2013; Bohus et al., 2019). The essential difference between DBT-PTSD and the standard Prolonged Exposure Protocol (Harned, Korslund, Foa, & Linehan, 2012; Harned, Korslund, & Linehan, 2014), is that exposure sessions are conducted in a skills-assisted manner in order to prevent dissociative symptoms during exposure. This takes account of the finding that state dissociation during psychotherapeutic interventions is accompanied with reduced treatment outcomes (Kleindienst et al., 2016).

During the first treatment period (weeks 1–3), individual psychotherapeutic goals of Mrs S. were derived from a problem analysis (1. reduction of avoidance behaviour and escape strategies by means of trauma-confrontation, 2. improvement of abilities to distance herself from others, 3. improvement of sexuality) and Mrs S. learned how to use distress tolerance skills effectively to prepare herself for the exposure treatment.

During the second period (weeks 4–9), a graded exposure-based treatment started at the beginning of the 24th week of pregnancy. In our case, the skills-assisted exposure took place in two therapist-guided sessions per week followed by self-management sessions (3 sessions/week), during which the patient repeatedly listened to recordings of the therapist-

guided in sensu exposure sessions. In order to prevent dissociative symptoms during self-administered exposure, the computer program Morpheus was applied. Morpheus continuously monitors the level of dissociative states and offers state-related antidissociative skills (Gorg et al., 2016).

In addition to exposure, Mrs S. worked on distancing herself from her mother and practiced self-care skills. The last treatment period focused on the transfer from the clinical setting to everyday life.

3. Treatment results

The baseline DTS score pointed to a moderate symptom severity regarding PTSD symptoms at the time of hospitalization. Looking at the course of treatment (see Table 1), PTSD symptoms, particularly the intensity of intrusions and hyperarousal, increased from the date of admission, reached the maximum when exposure started around the 24th week of pregnancy and decreased below baseline-level at the end of treatment. In contrast, avoidance behaviour continually decreased from the date of admission until the end of therapy. Regarding **statistically reliable changes**, we found the RCI for the total DTS sum scores to be at $RCI = 2.09 \geq 1.96$.

Decreased values in the BSL-23 show major improvements regarding DSO. In summary, an improvement of psychosocial functioning due to a decreased level of PTSD-related symptoms was observed.

The 6-month catamnesis revealed a stable reduction of intrusive symptoms, whereas the frequency of avoidance behaviour modestly increased again. BSL-23 values also remained stable 6 month after birth.

For a better overview, Table 1 represents the raw scores of all (sub-) scales over the treatment periods.

The course of pregnancy was not affected by treatment-induced psychological and physical symptoms and our patient gave birth to a healthy boy.

4. Discussion

Even though PTSD is common in pregnant women (Khoramroudi, 2018) and affects the health of both

Table 1. Treatment results regarding PTSD core symptoms and disturbances in self-organization (DSO).

Week of Pregnancy	Davidson trauma scale								DSO
	Frequency			Intensity			Frequency	Intensity	
	Avoidance behaviour and emotional numbing			Avoidance behaviour and emotional numbing			Total scale	Total scale	
	Intrusions	Hyperarousal		Intrusions	Hyperarousal				BSL-23
21	9	14	10	10	16	8	33	34	1.87
23	9	9	11	14	9	11	29	34	1.87
26	9	10	11	14	10	11	30	35	0.78
29	9	9	7	14	10	8	25	32	0.56
31	8	6	10	9	7	7	24	23	1
6 Month after Birth	8	7	8	9	6	7	23	22	1.04

mother and child, there is a lack of evidence on (exposure-based) treatment methods during pregnancy.

Before including Mrs S. into our DBT-PTSD program, we performed a careful risk-benefit-assessment and considered previous findings regarding the course of mental disorders during pregnancy. For example, a previous study could show that general stress and, in particular, PTSD-symptoms, increased during the third trimester of pregnancy (Onoye et al., 2013). Further analysis of the subcategories 're-experiencing', 'avoidance' and 'arousal' showed that this increase in symptom severity was mainly due to the subcategory 're-experiencing'. One essential goal of exposure-based treatment options is to reduce precisely this category of symptoms and without disorder-specific psychotherapeutic interventions, a worsening of Mrs S. PTSD symptoms during the course of pregnancy could have been expected. In light of these findings, it seems especially interesting that we found the opposite effect in terms of a stable reduction of intrusive symptoms after 12-week DBT-PTSD, which can be associated with the chosen exposure-based treatment option. On the other hand, it must be kept in mind that exposure-based treatment is commonly linked to initial worsening of symptoms, which was observed by us as well and might be considered an actualization of the traumatic event. In this context, the increase in intrusions and hyperarousal may further be seen as a result of the reduction of avoidance behaviour, which was observed at the same time. When discussing the consequences of psychological stress and PTSD during pregnancy, biomolecular transgenerational effects should also be taken into account. Perroud et al. (2014) showed that DNA methylation modifications in pregnant mothers suffering from PTSD were inheritable by their children and associated with lower cortisol levels. Mulligan et al. (2012) related prenatal maternal stress to increased DNA methylation levels of the premotor region of the NR3C1 glucocorticoid receptor in their offspring, which might result in an increased stress reactivity, and thus presents a risk factor for chronic diseases. Due to a number of limitations, such as small sample sizes and uncontrollable confounding factors, the results mentioned above provide only limited trendsetting impetus with respect to treatment-associated decision-making, but should certainly be taken into consideration. Regarding our case, Mrs S. was not only suffering from unspecific symptoms due to CSA, but further reported pronounced PTSD symptoms like continual re-experiencing of traumatic experiences and avoidance of trauma-related stimuli. In light of the described effects of CSA on motherhood, the benefit of a trauma-specific treatment approach outweighed possible epigenetic effects due to an increase in psychological distress at the beginning of the exposure sessions. A crucial point for the decision was the subjective impairment by Mrs S. PTSD symptoms, which

resulted in a constantly increased stress level and was thus considered a risk factor, not only for impaired postpartum mother-child bonding but also epigenetic changes due to the symptom-induced stress. When having the option, it is certainly more desirable to treat PTSD symptoms prior to pregnancy. However, as this is not always possible it is important to carefully consider the consequences of untreated PTSD on the course of pregnancy but also on the dyadic mother-child interaction right after birth. In cases where symptom severity is less pronounced, it might still be more beneficial to confine the treatment to the mere application of stabilizing techniques. Within this framework, it might further be advisable to specifically prepare mothers suffering from cPTSD for the situation after delivery to prevent postpartum depression as well as impaired bonding.

To date and to our knowledge, there are no conclusive studies investigating exposure-based trauma therapy during pregnancy. Thus, our case report presents the first scientific attempt addressing this topic.

Still, there are a number of limitations which need to be mentioned: on the one hand, we have no discrete information on the frequency as well as the severity of the cPTSD symptoms by means of BSL or DTS scores prior to the admittance to our clinic. Thus, we cannot exclude that the inclusion to our treatment program already had an effect on the manifestation of Mrs S.' symptoms. Another critical limitation is the fact that we exclusively used self-administered measurements to assess the extent of symptoms. Especially considering that we merely collected the data of one patient, we could have added more validity by additionally implementing clinician-administered measurements. Furthermore, regarding our catamnesis, we merely collected data regarding Mrs S. herself, but have no information on the child with regard to mother-child-bonding or the post-partum development. Considering the study by Onoye et al. (2013), which found out that PTSD symptoms often increase during the third trimester, it would have been interesting to put more focus on Mrs S. first pregnancy in order to find out if she indeed experienced an increase in symptom severity during the course of it. This way, we would have been able to compare the course of her first pregnancy without treatment and her second pregnancy with treatment as well as the relating postpartum periods at least with regards to her subjective experience. On a related note, her subjective experience in terms of external study validity going beyond the collected questionnaire data could have been taken more into account and might have added interesting hints on the relevancy to everyday life after she was discharged from our clinic. Further, in order to weigh the potential risks and benefits of the chosen treatment, it would have been helpful to implement objective distress ratings such as heart rate and cortisol levels before, after and during the course of exposure. Finally, it is not

possible to draw strong and generalizable conclusions from a single case report.

Still, in our particular case, we can confirm that DBT-PTSD is a potential psychotherapeutic treatment option for patients suffering from cPTSD during pregnancy. In this regard, we still found a **statistically reliable** decrease in symptom severity when relating the changes in symptom severity of our patient to the respective statistical parameters of a general normative population. Thus the treatment results may be seen as a chance to interrupt transgenerational repetitions of dysfunctional family patterns. Looking at trauma-specific scores as represented by the DTS in more detail on the different subscales, intensity as well as frequency decreased from moderate to low, whereby the most striking effect was found on avoidance behaviour and emotional numbing. Even though the effects on intrusions were rather small, it needs to be kept in mind that in untreated PTSD, intrusions commonly increase during pregnancy, supposedly masking the impact of our intervention.

Further, DSO decreased by more than a standard deviation with regards to the distribution typically found in BPD patients. In order to allow a more generalizable assessment, further research in the form of randomized controlled trials would be desirable, yet hard to realize. There is one randomized controlled study (Baas, Stramrood, Dijkman, de Jongh, & van Pampus, 2017), which currently examines eye-movement desensitization and reprocessing (EMDR) therapy as an exposure-based treatment approach during pregnancy in patients with childbirth-associated PTSD and fear of birth. Even though the results will certainly be interesting and may help to make a decision on how to treat pregnant women suffering from PTSD, epigenetic aspects are not considered. Thus, additional case-control studies are needed to investigate transgenerational effects in terms of epigenetic changes in mothers and their children with regard to long-term child development.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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