Psychoneuroendocrinology (2014) 49, 280—289

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/psyneuen

Who is stressed? A pilot study of salivary cortisol and alpha-amylase concentrations in agoraphobic patients and their novice therapists undergoing in vivo exposure

Sarah Schumacher[a,b,*], Katharina Gaudlitz[a], Jens Plag[a], Robert Miller[c], Clemens Kirschbaum[c], Lydia Fehm[b], Thomas Fydrich[b], Andreas Ströhle[a]

[a] *Department of Psychiatry and Psychotherapy, Charité-Universitätsmedizin Berlin, Campus Charité Mitte, Berlin, Germany*
[b] *Department of Psychology, Humboldt University of Berlin, Berlin, Germany*
[c] *Department of Biopsychology, Technical University Dresden, Dresden, Germany*

Received 11 April 2014; received in revised form 26 June 2014; accepted 15 July 2014

KEYWORDS
Salivary alpha-amylase;
Salivary cortisol;
Stress;
Exposure therapy;
Agoraphobia;
Therapist trainees

Abstract In cognitive behavioural therapy of phobic anxiety, in vivo exposure is considered as an effective treatment strategy. Apparently, it involves the experience of stress and anxiety in patients. Given the therapist's role during exposure sessions, it is conceivable that the performance is also accompanied with the experience of stress in therapists, especially when unversed in conducting psychotherapy. Studies confirmed that cognitive behavioural therapists tend to avoid therapist-guided in vivo exposure. The objective of this study was the simultaneous investigation of therapist's and patient's stress response during in vivo exposure. Therefore, 23 agoraphobic patients and their 23 treating therapists in training provided five saliva samples during an in vivo exposure and five samples during an ordinary therapy session. Before and during exposure session, subjective evaluations of stress and anxiety were assessed. Results suggested that therapists reported similar levels of perceived stress as patients before exposure. Both groups displayed significantly elevated salivary cortisol (sC) levels during exposure compared to the control session and a trend for alterations in salivary alpha-amylase (sAA) activity was found. Therapists reached peak concentrations of sC before start of the intervention followed by a decline during exposure, while patients displayed peak levels of cortisol secretion after 60 min of exposure.

* Corresponding author at: Department of Psychiatry and Psychotherapy, Charité-Universitätsmedizin Berlin, Campus Charité Mitte, Charitéplatz 1, 10117 Berlin, Germany. Tel.: +49 30 450 517218; fax: +49 30 450 517934.
E-mail address: sarah.schumacher@charite.de (S. Schumacher).

http://dx.doi.org/10.1016/j.psyneuen.2014.07.016

In vivo exposure seems to be a demanding intervention not only for the patient, but also for therapists in training. However, it was also demonstrated that physiological and subjective stress rather decrease during the intervention and that both groups rated exposure to be substantially successful. Based on the presented results, another potential factor contributing to the underusage of exposure treatment is conceivable and needs to be addressed in future research.

1. Introduction

In cognitive behavioural therapy (CBT), in vivo exposure is considered as the treatment of choice for phobic anxiety (Mitte, 2005; Sanchez-Meca et al., 2010). Based on a model that is similar to the models of extinction of conditioned fears, exposure treatment targets the avoidance of the feared stimuli or situation by the patient (Bouton et al., 2001; Delgado et al., 2006). Therefore, agoraphobic individuals are typically exposed to feared situations. Naturally, this intervention is associated with the experience of anxiety and would intuitively seem to be a highly stressful event for the patient. Accordingly, one could assume an involvement of the physiological stress system leading to an activation of the two branches of the stress response, i.e., hypothalamus—pituitary—adrenal (HPA) system and autonomic nervous system (ANS). Two prior studies reported increased cortisol, an indicator of HPA activity, in patients with animal phobia (Nesse et al., 1985) who were confronted with the phobic animal and in specific phobia when patients were exposed to phobic slides (Fredrikson et al., 1985). However, recent data revealed a non-response of cortisol in agoraphobic patients (Siegmund et al., 2011) and also in specific phobia (van Duinen et al., 2010) during in vivo exposure while Alpers et al. (2003) found heightened cortisol levels in driving phobics undergoing exposure. Moreover, when assessing cortisol responses during naturally occurring panic attacks, no (Cameron et al., 1987) or only a marginal increase (Bandelow et al., 2000) in cortisol was determined, while in a standardized laboratory stress protocol an explicit hypo-response of the HPA system was detected in patients with panic disorder (Petrowski et al., 2010). Data with regard to the ANS response in agoraphobia is still lacking. Since stress hormones are known to be related to processes such as conditioning and extinction of fear (McGaugh and Roozendaal, 2002), a thorough investigation of the stress response in agoraphobic patients is certainly of interest, especially during extinction-based interventions such as in vivo exposure (Bentz et al., 2010; Hamacher-Dang et al., 2013).

Considering the psychotherapist's role during therapist-guided exposure, which involves the motivation of the patient to enter and stay in the situation (despite the experience of extreme fear or panic attacks) and the prevention of avoidance strategies, one could speculate that to a certain extent exposure might also lead to the experience of stress in the therapist. Notably, evidence was found that, in clinical practice, exposure-based interventions are only rarely applied (Freiheit et al., 2004; Hipol and Deacon, 2013) and therapists show a tendency to postpone or even avoid the realization of therapist-guided in-vivo exposure (Powers and Deacon, 2013; Roth et al., 2004). Only few patients with anxiety disorders report to have received in vivo exposures during their treatment (Goisman et al., 1999; Marcks et al., 2009). There seems to be a clear discrepancy between the proven efficacy of therapist-assisted exposure (Gloster et al., 2011) and the treatment most therapists deliver to patients with pathological anxiety. It was suggested that therapists might display restraint with regard to exposure therapy due to certain negative beliefs (Deacon et al., 2013), lack of training (Harned et al., 2011) or even ethical concerns (Olatunji et al., 2009). However, another factor leading to the underutilisation of in vivo exposure could be the therapist's own stress experience (potentially resulting in an increased activity of the physiological stress system) which might be perceived as dissuasive or even aversive, particularly when the therapist is rather inexperienced. Furthermore, recent evidence suggests that the passive observation of stressed individuals (e.g., patients during in vivo exposure) may suffice to induce HPA system activity in the observer (Engert et al., 2014).

To date, there is a lack of studies inspecting the activation of the stress system in psychotherapists. So far, only one pilot study assessed the physiological stress response of novice therapists while providing psychotherapy for patients with borderline traits and found increased HPA and ANS activity before sessions with formerly suicidal patients (Miller et al., 2010). Given the scarce evidence, the objective of the current study was to conduct an in vivo naturalistic investigation and to assess both, the psychological and neuroendocrine responses to exposure treatment in agoraphobic patients as well as in their novice therapists.

Reliable assessment of HPA activation in stressful situations is available through the measurement of salivary cortisol (sC) (Kirschbaum and Hellhammer, 1994). sC has been shown to be sensitive in response to various stressors (for an overview, see Foley and Kirschbaum, 2010). Moreover, saliva-based sampling (non-invasive, cost effective, and convenient) facilitates the investigation of HPA activity in ecologically valid settings.

In recent literature, salivary alpha-amylase (sAA) has proven useful to measure autonomic activity in healthy subjects (Nater and Rohleder, 2009) as well as in psychopathology (Schumacher et al., 2013). Although stress-induced sAA increases predominantly reflect the involvement of the sympathetic nervous system (SNS) (Rohleder et al., 2006), the role of the parasympathetic nervous system (PNS) in the regulation of sAA is still under debate (Bosch et al., 2011). Therefore, sAA is referred to as an ANS marker.

By the simultaneous inspection of patient's and therapist's stress response, the study follows an innovative approach in order to enlighten the so far scarce or rather inconclusive data on agoraphobics during situationally induced fear and to determine another potential factor