



Therapists' and patients' stress responses during graduated versus flooding in vivo exposure in the treatment of specific phobia: A preliminary observational study

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ABSTRACT

Exposure therapy is considered an effective treatment strategy for phobic anxiety, however, it is rarely applied in clinical practice. The under-usage might be due to various factors of which heightened stress levels not only in patients but also in therapists are presumed to be of particular relevance. The present study aimed to investigate whether different forms of exposure might lead to varying physiological and psychological stress responses in therapists and phobic patients. 25 patients with specific phobia underwent individual cognitive behavioural therapy, performed by 25 psychotherapist trainees, applying exposure sessions in graduated form or the flooding technique. Patients and therapists provided subjective evaluations of stress and five saliva samples for analysis of salivary cortisol and alpha-amylase either during two graduated exposure sessions or during one flooding session, while a regular therapy session served as control condition. Therapists displayed heightened salivary alpha-amylase release during exposure of the flooding, but not the graduated, type. Patients showed elevated salivary cortisol during flooding exposure numerically, however, not on a statistically significant level. Therapists reported more pronounced subjective stress during flooding compared to graduated exposure. Elevated stress levels should be addressed in clinical training in order to improve application of exposure in routine practice.

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1. Introduction

Specific phobia, defined as an unreasonable fear of a particular object or situation according to DSM-V (American Psychiatric Association, 2013), is considered as one of the most common mental disorders with lifetime prevalence rates of 12.5% in the US (Kessler et al., 2005) and 10% in the German general population (Jacobi et al., 2014). Although most affected subjects are usually aware that their fear is exaggerated, a simple phobia can severely impact someone's life and therefore become clinically relevant (i.e., treatment is indicated). Importantly, treatment rates for patients suffering from specific phobia are (in Germany) clearly lower than for other anxiety disorders (Wittchen et al., 2001) implying that patients do not seem to seek treatment in outpatient clinics. This is noteworthy since in the context of cognitive behavioural therapy

(CBT) effective treatment strategies for specific phobia are available. Specifically, exposure therapy (ET) has been proven to be a powerful agent in the therapy of anxiety disorders (Hofmann and Smits, 2008; Craske et al., 2014) and is considered the method of choice, that is, the first-line treatment approach for specific phobia (Bandelow et al., 2014). The principle of exposure is based on the models of extinction of conditioned fear indicating that the patient is confronted with the phobic stimulus in order to ensure activation and “re-learning” of the physiological, behavioural and cognitive aspects of anxiety (Delgado et al., 2006). However, exposure can take several forms and can be structured in a number of ways, such as graduated (“step-wise”) or intense (“flooding technique”), brief (e.g., one-session treatment for spider phobia, Ost (1996)) or prolonged (repeated exposure to feared stimuli), and imaginal (in sensu), interoceptive, and in real life (in vivo). In addition, therapist-assisted exposure sessions seem to be more promising with regard to treatment outcome than just instructing the patient for unmonitored exposure (Gloster et al., 2011; Lang et al., 2012).

Despite its well-documented effectiveness in the treatment of pathological anxiety, ET and particularly in vivo exposure is often

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not applied in clinical practice (Freiheit et al., 2004; Hipol and Deacon, 2013). Due to the noted underutilisation of this evidence-based treatment, recent publications investigated reservations in psychotherapists (Deacon et al., 2013; Farrell et al., 2013b) which resulted in the development of training strategies in order to alter concerns and negative beliefs about ET (Harned et al., 2011; Farrell et al., 2013a). Moreover, it is presumable that potentially increased stress responses during exposure might be perceived as aversive by therapists. Accordingly, in a prior study, it was shown that not only patients (with agoraphobia) but also therapist trainees experience higher physiological and subjective stress in the face of in vivo exposure (of the flooding type) compared to an ordinary therapy session (Schumacher et al., 2014), which could potentially be another factor contributing to the postponement or avoidance of therapist-guided in vivo exposure by CBT therapists (Roth et al., 2004; Powers and Deacon, 2013).

Since various forms of exposure differ substantially with regard to performance, it is conceivable that they might result in deviating physiological stress responses. For example, it could be speculated that therapists might display heightened physiological stress only during intense forms of exposure but less during stepwise approaches. Finally, subjectively perceived stress levels might as well differ depending on the exposure form. Therefore, a thorough psychobiological investigation of different forms of exposure could potentially provide more detailed information on barriers that keep therapists from performance of this intervention.

The assessment of physiological stress during interventions such as exposure is obvious due to the proposed association between stress markers and processes such as conditioning and fear extinction (McGaugh and Roozendaal, 2002). However, previous research investigating patients with specific phobia undergoing various forms of exposure (intense and graduated) led to heterogeneous results and therefore, data remains quite unclear. While prior studies found elevated physiological stress during in vivo exposure in animal phobia (Fredrikson et al., 1985; Nesse et al., 1985; Knopf and Pössel, 2009), blood and mutilation phobics (Fredrikson et al., 1985), height phobia (Abelson and Curtis, 1989) or in driving phobics (Alpers et al., 2003), recent studies reported blunted stress responses in patients with spider phobia (van Duinen et al., 2010; Lass-Hennemann and Michael, 2014; Soravia et al., 2014) or agoraphobia (Siegmund et al., 2011) undergoing exposure.

Physiological stress becomes manifest in two principle components of the stress response. It involves the activation of the nucleus coeruleus and the autonomic nervous system (ANS) leading to a prompt release of catecholamines like norepinephrine as well as the activation of the hypothalamus-pituitary-adrenal (HPA) system resulting in the secretion of glucocorticoids, such as cortisol, in the blood stream. Due to its secretion in response to beta-adrenergic stimuli, salivary alpha-amylase (sAA), an enzyme being produced in the salivary glands, was suggested to be a surrogate marker of the activation of the ANS in healthy (Nater and Rohleder, 2009) and in clinical (Schumacher et al., 2013) populations. Salivary cortisol (sC), reflecting the unbound, “free” hormone fraction in blood, is considered to be a valid index of HPA system activity (Kirschbaum and Hellhammer, 1994).

In order to enlighten the so far unclear data with regard to patients' stress response and to further distinguish therapists' stress levels in response to ET, the present study set out to simultaneously investigate patient's and therapist's sC and sAA concentrations during various forms of exposure. Therefore, the aims of the current observational study were: (1) the assessment of HPA and ANS activation in patients and therapists during two sessions of graduated exposure or during one session of flooding exposure in comparison to a regular therapy session and (2) the

comparison of subjective ratings of stress and anxiety before and during graduated and flooding exposure.

Given the inconsistent literature, it is hypothesised that (a) patients display heightened sC and sAA concentrations during exposure session of the flooding type in comparison to a regular therapy session (as demonstrated before, see Schumacher et al., 2014) while graduated exposure does not lead to an activation of the stress system (van Duinen et al., 2010; Lass-Hennemann and Michael, 2014; Soravia et al., 2014); (b) therapists show increased sC and sAA level during exposure session compared to a regular therapy session (Schumacher et al., 2014), but only during exposure of the flooding type; and (c) exposure of the flooding type results in higher subjective stress and anxiety in therapists and patients.

2. Methods

2.1. Participants

25 patients diagnosed with specific phobia according to the German version of the Structured Clinical Interview for DSM-IV axis I disorders (DSM-IV, SCID) (First et al., 1997) were included in the study sample. Patients suffering from the blood-injection-injury type were excluded from the study due to a differing rationale for exposure sessions as well as patients with dental phobia because of practical issues with regard to saliva collection. Additionally, 25 psychotherapist trainees who performed an exposure-based CBT for specific phobia were added to the sample. Patients were recruited at an outpatient clinic specialised in anxiety disorders at the Department of Psychiatry and Psychotherapy, Campus Charité Mitte, Berlin while therapists were recruited at the Clinical Training Institute for Cognitive Behaviour Therapy at the Humboldt-University (ZPHU), Berlin where also the treatments took place.

Therapists varied regarding their clinical experience (in training for (months): $M=30.7$; $SD=13.4$, range=2–62); and their experience with regard to realisation of ET (number of so far performed exposure sessions: $M=4$; $IQR(interquartile\ range)=6.5$). Although two patients had been in cognitive behavioural treatment before (Table 1), none of the patients had undergone ET, yet.

For detailed sample characteristics of therapists and patients, see Table 1.

The ethics committee of the Charité-Universitätsmedizin Berlin, Campus Charité Mitte approved the study protocol and all participants signed an informed consent form before assessment.

2.2. Procedures

Exposure sessions were either performed in a graduated form, that is, patients were progressively exposed to more phobic situations, or by use of the flooding technique implying that during the first exposure the patient was in vivo confronted with the anxiety-eliciting stimulus or situation which would be the most feared stimulus or situation according to the patient's individual fear hierarchy (Jansson and Öst, 1982).

There is evidence for a superiority of in vivo exposure of the flooding type concerning phobias such as agoraphobia (Ruhmland and Margraf, 2001). However, due to the role of disgust, especially in animal phobia (Olantunji et al., 2011) the graduated approach is often applied in clinical practice in order to ensure the patients' willingness to undertake ET at all. Accordingly, based on standard clinical practice, each therapist-patient dyad agreed on the employed approach (graduated versus flooding). Usually, in the context of animal phobias, a graduated procedure was performed

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