Journal of Anxiety Disorders 52 (2017) 1–7

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

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

A randomized controlled study of power posing before public speaking exposure for social anxiety disorder: No evidence for augmentative effects

Michelle L. Davis[a,*], Santiago Papini[a], David Rosenfield[b], Karin Roelofs[c], Sarah Kolb[d], Mark B. Powers[a,e], Jasper A.J. Smits[a]

[a] Department of Psychology and Institute for Mental Health Research, The University of Texas at Austin, United States
[b] Department of Psychology, Southern Methodist University, United States
[c] Donders Institute for Brain Cognition and Behaviour and Behavioural Science Institute, Radboud University, Netherlands
[d] Department of Psychology, University of Würzburg, Germany
[e] Baylor University Medical Center, United States

ARTICLE INFO

Keywords:
Social anxiety disorder
Exposure therapy
Randomized trial

ABSTRACT

This manuscript details a randomized controlled study designed to test the efficacy of power posing (i.e., briefly holding postures associated with dominance and power) as an augmentative strategy for exposure therapy for social anxiety disorder (SAD). Seventy-three individuals diagnosed with SAD were assigned to one of three conditions: power posing, submissive posing, or rest (no posing) prior to participating in an exposure therapy session. Participants were assessed for between-group differences in pre- and post-manipulation salivary hormone levels, within-session subjective experiences of fear, and pre- and 1-week post-treatment SAD severity outcome measures. Though the intervention resulted in decreased SAD symptom severity one week later, analyses revealed no significant between-group differences on any tested variables. Accordingly, this study provides no evidence to suggest that power posing impacts hormone levels or exposure therapy outcomes.

1. Introduction

Testosterone, a steroid androgen hormone, has been shown to be an important regulator of social motivational behavior, and particularly approach behavior. Several studies have now demonstrated that testosterone administration increases social approach motivation (Bos, van Honk, Ramsey, Stein, & Hermans, 2013; Enter, Spinhoven, & Roelofs, 2014; Hermans, Putman, Baas, Koppeschaar, & Van Honk, 2006; Hermans, Ramsey, & Van Honk, 2008; Radke et al., 2015; Terburg, Aarts, & Van Honk, 2012; van Honk et al., 2001; Van Honk, Peper, & Schutter, 2005; Van Honk & Schutter, 2007). Given these observations, testosterone levels emerge as a potentially important target for clinical interventions that rely on approach behavior. Exposure therapy, an established treatment for social anxiety disorder (SAD; Hofmann & Smits, 2008), involves systematically and repeatedly approaching feared social cues (i.e., stimuli perceived as threatening) to re-establish a sense of safety around these cues (i.e., fear extinction; Hofmann, 2008; Otto, Smits, & Reese, 2004; Powers, Smits, Leyro, & Otto, 2007). Though efficacious for SAD (Hofmann & Smits, 2008), there is much room for improvement, and thus targeting testosterone levels may hold clinical value. Indeed, recent basic research shows that testosterone administration can facilitate approach toward angry (i.e., perceived socially threatening) faces (Enter, Spinhoven, & Roelofs, 2016), and reduce gaze avoidance (Enter, Terburg, Harrewijn, Spinhoven, & Roelofs, 2016) among persons with SAD. Accordingly, increasing testosterone levels prior to exposure therapy may lead to enhanced fear extinction and thus better outcomes. In addition to testing the effects of direct testosterone administration, it is also important to develop and test non-pharmacological augmentation strategies that are preferable to patients and easily implemented into an exposure session, and thus easier to disseminate (McHugh, Whitton, Peckham, Welge, & Otto, 2013).

Results from one study indicate that it may be possible to manipulate testosterone via changes in posture (Carney, Cuddy, & Yap, 2010). In this study, men and women were asked to hold either poses associated with dominance and high power (e.g., expansive, open postures; or power poses) or poses associated with submission and low power (e.g., contractive, closed postures; or submissive poses) for two minutes. Participants in the power posing condition evidenced increases in testosterone levels, decreases in cortisol levels, and increases in subconscious feelings of power and risk taking. Though a recent study (Ranehill et al., 2015) – published after the current study was initiated – successfully replicated the findings regarding power posing leading to increased subjective feelings of power, they found no impact of postural

* Corresponding author at: 305 E. 23rd St., Stop E9000; Austin, TX 78712, United States.
E-mail address: michelledavis@utexas.edu (M.L. Davis).

http://dx.doi.org/10.1016/j.janxdis.2017.09.004
Received 28 June 2017; Received in revised form 11 September 2017; Accepted 13 September 2017
Available online 18 September 2017
0887-6185/

manipulation on hormone levels. However, it is important to note that the Ranehill study protocol deviated from the Carney study in important ways (e.g., participants were given the rationale for the postures rather than using deception; see review by Carney et al. (2015)). Additionally, a recent review notes a history of the embodied effects of expansive postures on feelings of dominance and power (Carney, Cuddy, & Yap, 2015), including increased feelings of power, action orientation, and risk taking, as well as decreased threat perception and fear. Accordingly, there is overlap between the psychological and anxiolytic effects of power posing and the effects of testosterone administration, and the Carney et al. (2010) study lends preliminary evidence that power posing may cause increases in endogenous testosterone levels.

1.1. Aims

The current manuscript details a proof-of principle study examining power posing as an augmentative strategy for exposure therapy for SAD. We tested whether power posing (compared to submissive posing or rest) would (1) increase testosterone; (2) result in superior exposure therapy outcomes (i.e., decreased symptom severity and fear responding during a public speech); and (3) whether testosterone changes predicted future symptom reduction among individuals engaging in power posing. Due to the aforementioned research indicating potential decrements in cortisol (Carney et al., 2010) and/or anxiolytic effects of power posing (Riskind & Gotay, 1982; Welker, Oberleitner, Cain, & Carré, 2013), we also tested whether power posing (compared to submissive posing or rest) would (4) decrease cortisol; and (5) result in increased self-reported fear within the exposure session.

2. Method

2.1. Participants

Participants (aged 18–70) were recruited from advertisements at the University of Texas and in the Austin community (see Table 1). Participants (N = 73) were diagnosed with SAD as their primary psychiatric diagnosis (i.e., the most important source of current distress) and endorsed fear of public speaking as a primary concern. Exclusion criteria included current use of testosterone enhancing products or corticosteroid medications, a lifetime history of bipolar or psychotic disorders, a history of substance or alcohol use disorders in the past six months, significant suicidal ideation, current utilization of psychotherapy for SAD, and prior non-response to exposure therapy. Participants using psychotropic medication could participate in the study if they had been on a stable dose of medication for three weeks prior to the treatment session. Participants were not paid for their participation, though students were offered course credit. All participants completed in the informed consent process prior to beginning the study procedures. This study was registered on clinicaltrials.gov (NCT02482805).

Table 1
Participant Characteristics by Condition (N = 73).

Variable	Power Posing (n = 26)		Submissive Posing (n = 27)		Rest (n = 20)	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Age	26.88	6.99	25.26	8.99	24.60	5.83
LSAS-performance	37.96	14.39	36.19	10.92	37.85	10.16
	n	%	n	%	n	%
White	14	53.8	14	51.9	11	55.0
Female	18	69.2	18	66.7	16	80.0
College graduate	11	42.3	16	59.3	9	45.0

2.2. Procedures

2.2.1. Eligibility screening

Participants first completed an online prescreen, which was examined for clear exclusion criteria (e.g., no social anxiety symptoms, current exposure therapy treatment, etc.). Participants who appeared eligible were invited to participate in a phone interview for diagnostic screening, using the Mini International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998) to evaluate the presence of psychiatric inclusion and exclusion criteria. Eligible participants were invited to participate in the treatment session. See Fig. 1 for consort diagram.

2.2.2. Randomization

Participants were randomized to participate in power posing, submissive posing, or rest (no posture manipulation) using a randomization sheet developed by an independent investigator. Randomization was blocked by subject pool (i.e., community participants versus University students, and low SAD severity versus high SAD severity) to control for potential differences in compensation and baseline severity levels. The cut-off for high SAD severity was a score of 70 or higher on the pretreatment Liebowitz Social Anxiety Scale (LSAS) total score. Randomization information was placed in envelopes that were not opened by the therapist until immediately prior to the posture manipulation (i.e., the therapist was blind to treatment condition throughout the rationale and exposure planning components of the treatment session).

2.2.3. Treatment session

Rodebaugh, Levinson, and Lenze (2013) described a standardized test (i.e., clinical assay) for examining augmentative strategies (e.g., pharmacotherapy) for exposure therapy for SAD in an efficient, feasible manner. This protocol involves a standardized exposure therapy session in which participants plan a public speaking exposure expected to elicit a peak fear rating (using the Subjective Units of Distress Scale or SUDS, described below) of 75. The intent of this approach is to standardize the experience of anxiety (using predicted SUDS), rather than standardizing elements of the procedures, in order to provide a “clinical assay” that can be employed to test augmentation strategies and mechanisms of change. In addition to the study by Rodebaugh et al. (2013), there are several examples of fruitful research projects utilizing similar “clinical assays” to test augmentative strategies, many of which have formed the basis for subsequent treatment development research (Powers, Smits, & Telch, 2004; Ressler et al., 2004; Sloan & Telch, 2002; Smits et al., 2013; Telch et al., 2014; Wolitzky & Telch, 2009). We conducted a similar (though not identical) protocol to the Rodebaugh study, allowing participants to vary the following flexible elements in their exposure: topic of speech, utilization of confederate audience members, availability of notes, time for preparation, and reaction of experimenter. Therapists were three graduate-student level therapists trained and supervised by the senior author.

Prior to the session, participants completed questionnaires assessing demographic and SAD severity measures. At the onset of the session, participants first watched a video describing the cognitive-behavioral model of SAD and the rationale for exposure therapy. Therapists then familiarized the participant with the SUDS scale and guided participants in designing a 5-min speech exposure with specific behavioral goals designed to decrease avoidance. The participants then participated in the posturing manipulation protocol (see below). Following the posturing manipulation, they began their speeches after a brief wait period. Participants provided fear ratings at the start and end of each speech (recalling the highest level of fear they experienced over the course of the speech), and delivered the same 5-min speech (with the same behavioral goals) three times. After the exposures, participants processed the exercise with the therapist.