The influence of stress on social cognition in patients with borderline personality disorder

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Summary
Background: Borderline personality disorder (BPD) is characterized by severe difficulties in inter-personal relationships and emotional functioning. Theories of BPD suggest that individuals with BPD have heightened emotional sensitivity, increased stress reactivity, and problems in making sense of intentions of others. In this study we investigated stress reactivity in BPD and its interference with social cognition, and tested whether any differences are specific for BPD or are inherent to personality disorders in general.
Methods: We investigated 22 patients with BPD, 23 patients with Cluster C personality disorder (CPD), and 24 nonpatients on facial emotion recognition and social evaluation before and after stress induction based on the Trier Social Stress Test (TSST).
Results: The results show that stress increased subjective negative emotions in the BPD group to a larger extent than in the other groups, whereas physiological responses were attenuated.

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Importantly stress induction increased negative evaluations about others, but surprisingly to a similar extent in the BPD and CPD groups as in the nonpatient control group. In addition facial emotion recognition performance was higher after than before stress, but no significant group differences were observed.

Conclusion: These results suggest that heightened psychological reactivity in BPD co-occurs with attenuated physiological responses to psychosocial stress and that stress affects social cognition to a similar extent in BPD as in others.

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1. Introduction

Borderline personality disorder (BPD) is characterized by severe difficulties in interpersonal relationships and emotional functioning (APA, 2000). Relationships of individuals with BPD are chaotic, intense and marked with difficulties. Furthermore, it has been assumed that they are emotionally more susceptible to social cues that signal social threat or rejection (Domes et al., 2009). Linehan et al. (2007) suggested that individuals with BPD have intense reactions to emotional stimuli and an inability to regulate their intense physiological arousal. It is unclear how emotional reactivity is related to problems in social interaction. The theory of Fonagy and Bateman (2008) posits that, due to early trauma and disruption of the attachment relationships, the capacity to make sense of oneself and others (i.e. mentalization) becomes unstable during emotional arousal. This suggests that emotional reactivity might interfere with social cognition capacities. Emotional reactivity elicits the rapid release of the stress hormones adrenaline and noradrenaline via the autonomic nervous system and the slow release of cortisol via the hypothalamus—pituitary—adrenal (HPA) axis (Ulrich-Lai and Herman, 2009). Initial studies that investigated HPA axis functioning in BPD suggest that its negative feedback on the release of cortisol is reduced, though this appears to have little influence on basal cortisol levels (Zimmerman and Choi-Kain, 2009). More recent studies investigated emotional and physiological reactivity in social interaction by inducing social stress. One study found elevated cortisol levels during recovery after an interpersonal conflict task in patients with BPD compared to nonpatients (Walter et al., 2008). Other studies have used the well-established Trier Social Stress Test (TSST) and observed heightened subjective emotional distress and cortisol reactivity in BPD patients with severe dissociation, but not in those with low dissociation (Simeon et al., 2007). In contrast, later studies with larger samples found attenuated cortisol responses using the same TSST protocol even though the participants with BPD reported higher subjective emotional intensity (Nater et al., 2010; Scott et al., 2013). Although these stress induction studies show mixed results, they provide initial evidence for dysregulation of the stress system in BPD.

Another line of research has investigated social cognition in BPD. Social cognition refers to the capacity to understand ourselves and others as individuals with feelings, beliefs and a personality (Marton et al., 2005; Mitchell et al., 2004) and is considered to be essential to successful social adaption (Arntz et al., 2009). One aspect of social cognition is the ability to correctly recognize facial expressions of others. Studies that investigated facial emotion recognition found that patients with BPD recognize emotions of others either less accurately (Levine et al., 1997) or more accurately (Lynch et al., 2006; Domes et al., 2008; Schulze et al., 2013). Another aspect of social cognition is the capacity to understand perspectives and intentions of others, underlying their observable behavior (theory of mind or mentalizing; Arntz et al., 2009). Studies that investigated more complex social cognition found better performance on a theory of mind test in BPD compared to control groups (Fertuck et al., 2009; Arntz et al., 2009), but also found impaired social cognitive abilities in BPD (Preißler et al., 2010). Other studies found a stronger tendency in BPD to describe others in a more negative and dichotomous manner (Veen and Arntz, 2000; Arntz and Veen, 2001; Sieswerda et al., 2013; Arntz and Ten Haaf, 2012).

Although the results from these studies are mixed, they support the notion that BPD is associated with dysfunctional emotional as well as social processing. Daros and colleagues (2013) proposed a model to explain the divergent findings in facial emotion recognition, in which moderate levels of arousal enhance social cognitive performance but high levels of arousal deteriorate performance in BPD. Research in healthy individuals indeed suggests that arousal affects social cognition. For example, performance on a social cognition test after stress induction is improved in women with moderate cortisol responses, but performance is lower in women with higher cortisol responses. (Smeets et al., 2009). Furthermore, the induction of negative emotions influences social problem solving negatively in individuals with BPD traits (Dixon-Gordon et al., 2011). However, it remains unclear if stress affects social cognition in patients with BPD, which could be an explanation for their social interaction problems. To directly address whether dysregulation of the stress system affects social cognition in BPD, we assessed facial emotion recognition and social evaluation before and after social stress. Because none of the former stress studies examined whether stress regulation problems were specific for BPD, we compared a BPD patient group with a Cluster C personality disorder (CPD) patient group and a nonpatient control group. Before and after social stress induction based on the TSST, participants completed a facial emotion recognition task and a social evaluation task that assessed the participant's evaluation of the experimenter during social interaction. On the basis of recent TSST studies (Nater et al., 2010; Scott et al., 2013), we expected that the BPD group would show dysregulation of the stress system, as reflected by enhanced emotional but reduced physiological responses to stress. We did not already expect large differences in facial emotion recognition performance at baseline, as emotion recognition accuracy is not strongly affected in