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Adolescent anorexia nervosa patients have a discrepancy between neurophysiological responses and self-reported emotional arousal to psychosocial stress

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Abstract

In both clinical practice and research, eating disorder patients are reported to have difficulties in identifying and describing their feelings. They are often described as being unaware of the linkage between their feelings and their behavior. The present study experimentally induced emotions in adolescent anorexia nervosa (AN) patients to examine both self-reported emotional arousal and neurophysiological responses. A group of 10 AN patients and a group of 22 healthy controls (HC) were compared with respect to changes in self-reported emotional arousal and neurophysiological responses, heart rate (HR) and HPA-axis response (cortisol in saliva) during a public speaking test inducing anxious stress. The AN group reported higher levels of anxiety, as a result of stress, but this was not reflected in their HR or cortisol response. By contrast, in the HC group higher levels of self-reported anxiety coincided with clear increases in HR and cortisol. The data indicate that AN patients, in contrast to healthy individuals, show a discordance between self-reported emotional and neurophysiological arousal during psychosocial stress.

Keywords: Alexithymia; Emotion induction; Hypothalamic-pituitary-adrenal axis; Cortisol; Heart rate

1. Introduction

In the last decade, studies have shown that the majority of anorexia nervosa (AN) patients can be categorized as alexithymic (e.g. Bourke et al., 1992).

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Alexithymia, a construct developed by Sifneos (1973), literally means "no words for emotions". It refers to a specific disturbance in emotional processing, which is clinically manifested by an impoverished imaginative life, by difficulties in identifying and describing feelings, and by thought content characterized by preoccupations with bodily symptoms and/or concrete details of events in the world (Sifneos, 1973; Nemiah, 1977).

The majority of the studies on alexithymia, among various groups of subjects, are performed through self-report questionnaires, e.g. the Beth Israel Questionnaire (BIQ; Sifneos, 1973) and the Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994a,b). However, alexithymia has also been examined using laboratory procedures inducing negative emotions. In these studies (mostly) healthy subjects were divided into alexithymic and non-alexithymic subgroups based on the criteria of the alexithymia instrument used and were compared with respect to emotional arousal and neurophysiological responses. The results, so far, are inconsistent: Some studies showed low neurophysiological responses in alexithymic subjects (Wehmer et al., 1995); other studies, however, showed elevated neurophysiological responses (Bagby et al., 1986; Martin and Pihl, 1986). And there were also studies in which no differences between alexithymic and non-alexithymic subjects were found (Papciak et al., 1985). Finally, some studies showed a constant state of neurophysiological hyperarousal [heart rate (HR)] in alexithymics, independent of the type of stressor used (Papciak et al., 1985; Wehmer et al., 1995; Stone and Nielson, 2001). The inconsistency in the results of these studies is probably due to the use of different alexithymia instruments, the use of different kinds of emotion-induction paradigms and the composition of the experimental groups.

The stress–alexithymia theory (Martin and Pihl, 1985) states that alexithymic individuals have an inability to accurately identify and express emotions, and, as a consequence, this may result in prolonged elevations of neurophysiological activation. Because of the high prevalence of alexithymia in AN (e.g. Bourke et al., 1992) and because so far no study has been carried out testing the stress–alexithymia theory in this particular psychiatric group, the present study was designed to examine the self-reported emotional arousal and neurophysiological responses in a group of adolescent AN patients in reaction to exposure to emotion induction. To that end, a public speaking test was used to induce negative emotions, anxiety in particular. HR and HPA-axis activation (via cortisol in saliva) were measured as neurophysiological parameters accompanying the emotional arousal. According to the stress–alexithymia theory (Martin and Pihl, 1985), a discrepancy was anticipated between elevated neurophysiological responses and low levels of emotional arousal, as a consequence of the earlier reported high levels of alexithymia in AN patients.

2. Methods

Ten anorexia nervosa (AN) patients were willing to participate and met the criteria for anorexia nervosa according to the DSM-IV criteria as assessed by the Eating Disorder Examination (EDE 12th edition; Fairburn and Cooper, 1993). Furthermore, the DSM-IV criteria for AN were assessed with a semi-structured psychiatric interview. All participating patients had a diagnosis of AN of the restrictive type, did not use medication or oral contraceptives, and did not smoke. The patients had a mean body mass index (BMI) of 16.2 (SD 1.2) and all had body mass percentiles less than 10. The 10th percentile was used as a cutoff score for the known potential nutritional risk (Flegal et al., 2002). The AN patients (all females) had a mean age of 15.5 years (SD 1.8). The mean duration of illness was 11 months with a minimum of 7 months and a maximum of 15 months. As part of their treatment, all patients were currently gaining weight, but they all still fulfilled the DSM-IV criteria for anorexia nervosa (including amenorrhea). Comorbidity was assessed by means of the DISC 2.3 (Diagnostic Interview Schedule for Children version 2.3; Fischer et al., 1992). Six out of 10 patients were categorized as having a depressive disorder (major depression or dysthymia) and also 6 out of 10 were categorized as having an anxiety disorder (social phobia, specific phobia, overanxious disorder or generalized anxiety disorder).

The 22 healthy controls (females) were recruited from a high school in the neighborhood of our hospital. They were chosen to participate when they matched the patient sample for age (between 14 and 18 years old)