

Sympathetic reactivity in agoraphobic patients with and without personality disorders

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Abstract

Objective: To compare sympathetic activity in agoraphobic patients with and without personality disorders before and after 11 weeks inpatient treatment. **Methods:** Agoraphobic patients ($n = 38$), 84% with panic disorder and 47% with personality disorders underwent cold pressure test (CPT), mental stress test (MST), and a specific anxiety test (SAT). Psychological assessments were done by the Bodily Sensations Questionnaire (BSQ), the Agoraphobic Cognitions Questionnaire (ACQ), Spielberger STAI-1 and -2, and a Stress Test Anxiety (STA) questionnaire. Sympathetic activity was

measured by blood pressure, heart rate, epinephrine, and norepinephrine. **Results:** The sympathetic activity did not differ significantly between patient groups, and the reactivity to stress was very low. The sympathetic reactivity remained unchanged after treatment, whereas psychiatric symptoms decreased. Correlations between sympathetic activity and psychological distress were not significant. **Conclusion:** Interpretation of bodily signals seems to be more important than the actual sympathetic activity in agoraphobic patients. © 2003 Elsevier Science Inc. All rights reserved.

Keywords: Agoraphobia; Anxiety; Panic disorder; Personality disorder; Stress test; Sympathetic activity

Introduction

For more than a century, the sympathetic nervous system has been linked to the pathogenesis of panic disorder [1,2]. These patients are highly sensitive to bodily sensations that might be subject to catastrophic misinterpretation [3]. This can be illustrated by the finding that among patients referred for first time for outpatient cardiological examination, there were 38% with panic disorder and 16% with coronary heart disease [4]. Increased cardiovascular mortality has been reported in patients with panic disorder as well as in men with phobic anxiety [5–8]. It has been suggested that the increased mortality may be due to cardiovascular hyper-reactivity to stress that may promote future cardiovascular events [9] and essential hypertension [10]. Alderman et al. [11] found that blood pressure reactivity to laboratory stressors might predict myocardial infarction among treated hypertensive subjects.

According to the DSM-IV [12], agoraphobia is considered a further development of panic disorder, and therefore a more serious and chronic condition. However, studies on neurobiological factors have almost exclusively focused on panic disorder with or without agoraphobia. This may have followed from the experience that agents like sodium lactate, carbon dioxide, caffeine, isoproterenol, yohimbine, and cholecystokinin may provoke panic attacks. As these agents differ in their specific neurochemical mechanisms and effects, however, a final common pathway has not yet been found [13].

Palmero et al. [14] found that university students with the personality trait Type A behaviour pattern, characterized by time urgency, hostility, and competitive behaviour showed greater activation, reactivity, and slower recovery than those with Type B pattern when in a stressful laboratory situation. Although there might be an association between reactivity and some personality traits, this does not necessarily mean that we would find the same relationship in a clinical sample of patients with personality disorders. Many patients with personality disorders, however, have experienced difficult and stressful life events during life, which may have

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influenced their autonomic nervous system in a different way than patients without personality disorders.

The prevalence of personality disorders (mostly cluster C) among panic disordered patients with and without agoraphobia has been reported as ranging from 27% to 58% in psychiatric samples [15,16]. To our knowledge, however, no studies have compared the reactivity in such patients with or without personality disorders. Neither are we aware of studies that have compared reactivity to stress before and after treatment for agoraphobia. We therefore decided to compare reactivity to stress in agoraphobic patients with and without personality disorder.

The aims of the present study has been to investigate the following research questions:

1. Are there differences in sympathetic activity at rest in agoraphobic patients with and without personality disorders?
2. Is the sympathetic reactivity to stress different in these two groups?
3. Have the sympathetic responses to stress changed after treatment in the two groups?
4. What is the relationship between sympathetic activity and psychological factors in the two groups?

Methods

Included in the study were 38 patients with agoraphobia and 32 (84%) of them also have panic disorder. There were 18 patients with personality disorders and 20 without. The patients had been admitted to an inpatient cognitive treatment program provided in group format. The unit is specialized in treating anxiety disorders. Patients were admitted to an 11-week group cognitive therapy program. The patients were diagnosed before treatment by using the Structural Clinical Interview for DSM-IV Axis I and Axis II disorders [17]. Patients were excluded from the study if there was evidence of long-term substance dependence, psychosis, bipolar disorder, or organic brain syndrome. Eight patients were admitted for each treatment period. They were included in the study consecutively from six admissions. Four patients did not want to participate or were excluded for other reasons. Among the 44 who were eligible, six could not complete the study because of problems with the blood sampling (five did not complete the study mainly because of parasympathetic symptoms that made blood sampling impossible) or withdrawal from treatment. Thus, 38 patients participated, with a mean age of 40.6 years (± 8 S.D., range 27–62), and 68% were females. The mean age at onset of the disorder was 25.3 years (± 7.6 S.D.). The diagnoses were independently checked by a trained rater and psychiatrist, but the patients were not re-diagnosed after treatment. The kappa coefficient for panic disorder with agoraphobia was .88, while the kappa for comorbid diagnoses ranged from .70 to 1.00.

Patients using medication (79%) discontinued this on arrival at the hospital. The patients had been without anxiolytics or antidepressants for 1 week before the tests. No patients were hypertensive.

Questionnaires

The Bodily Sensations Questionnaire (BSQ) [18] was used to measure fear of bodily sensations on a five-point scale (0–4).

The Agoraphobic Cognitions Questionnaire (ACQ) [18] was used to measure the belief in cognitions associated with agoraphobic behaviour.

To measure state and trait anxiety, Spielberger STAI-1 and -2 were used [19]. The patients were asked before and during each stress test what level of anxiety (STA=Stress Test Anxiety) they experienced, on a scale from 0 (*no anxiety at all*) to 10 (*maximum level of anxiety*). The figure was written down by the researchers.

Stress tests

The participants underwent three stress tests. A cold pressure test (CPT) was performed by immersing the hand completely in ice water (0 °C) for 1 min in order to provide a mainly biophysical stressor. A mental stress test (MST) was performed by giving the patients an arithmetic challenge test. They were asked to mentally subtract the number 13 repetitively for 5 min starting with 1079. In order to increase the stress, a metronome making noise at a frequency of 2 Hz was used and the participants were informed of any miscalculation. The number of errors was recorded. A specific anxiety test (SAT) was designed as an individual narrative based on each patient's memories of a high anxiety situation. The purpose of the SAT was to investigate if anxiety and catastrophic thoughts were elicited by mental imagination; thus, this stressor might be more directly linked to anxiety. One week prior to the administration of the SAT, each patient had given a detailed account of their worst panic attack ever. Based on this, one of the authors (LMH) presented the narrative for the patient and the level of anxiety was recorded. The patient then recorded the level of anxiety on a scale from 0 (*no anxiety at all*) to 10 (*the most anxious I have ever been*) and the probability that the catastrophic thoughts would actually happen on a scale from 0 (*not at all probable*) to 10 (*absolute certain that the catastrophe will happen*).

The tests were performed in random order. After 30 min of rest, about one-third started with the CPT, one-third with the MST, and one-third with the SAT. After each test was completed, the patients rested for at least 15 min before the next test. The patients were supine both during the tests and at rest.

The tests were performed after the patients had been hospitalized for 1 week, to ensure that they were all off anxiolytics and antidepressants, and at the beginning of the

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