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Catastrophic interpretations and anxiety sensitivity as predictors of panic-spectrum psychopathology in chronic obstructive pulmonary disease ☆

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ABSTRACT

Objective: Panic-spectrum psychopathology (denoting panic attacks and panic disorder) is highly prevalent in chronic obstructive pulmonary disease (COPD), and the cognitive model of panic has been proposed as an explanation of this high prevalence. In the current cross-sectional study we investigated factors predicting panic-spectrum psychopathology in COPD, and hypothesized that, consistent with the cognitive model, both the catastrophic interpretation of shortness of breath and elevated anxiety sensitivity would be significant predictors when variance shared with confounding variables was controlled.
Methods: Sixty-two participants with COPD were interviewed with the Anxiety Disorders Interview Schedule for DSM-IV, Panic Disorder section, and completed measures of interpretation of breathing difficulty, anxiety sensitivity, anxiety, depression, disease-specific quality of life, and stressful life events. Objective disease severity was measured using forced expiratory volume in the first second.
Results: Direct logistic regression was performed, and worse depressive symptoms, more catastrophic interpretations of shortness of breath, higher anxiety sensitivity, higher magnitude of recent stressful life events, and worse disease severity were each found to be significant unique predictors of panic-spectrum psychopathology in COPD after shared variance was controlled.
Conclusions: The results of the study provide support for the cognitive model of panic, and also suggest a diathesis-stress explanation of the development of panic-spectrum psychopathology in COPD. The findings have implications for future preventative psychological interventions.

1. Introduction

Chronic obstructive pulmonary disease (COPD) is a progressive, and ultimately fatal, lung disease caused primarily by cigarette smoking. In 2006, between 9 and 10% of all adults worldwide aged over 40 years met diagnostic criteria for the illness [1]. The Global Burden of Disease Study has estimated that by 2020 COPD will be the third leading cause of death [2]. As would be expected, the costs of COPD to individuals and to health care systems are substantial [3]. Panic attacks are common, and the prevalence of panic disorder in COPD is around ten times higher than the general population prevalence of 1.5–3.5%, with negative impacts including increased exacerbations, and increased frequency and duration of hospital admissions [4–7]. There is evidence that untreated panic attacks in COPD do not resolve, but may instead increase the risk of panic disorder developing [7]. For people with COPD, breathing, the most basic of all physical functions necessary for life, is objectively threatened, and this threat occurs in the context of a disabling terminal illness. Hence, the key symptom of shortness of breath on exertion lends itself to catastrophic overinterpretation (for example, as meaning that the person may die at that moment by suffocation or heart attack), consistent with the leading psychological model of panic, Clark's cognitive model [8,9]. In the model, a panic attack results when ambiguous bodily sensations are interpreted as imminently catastrophic, increasing arousal, and so creating a positive feedback loop, as shown in Fig. 1. This model has been supported by a large number of clinical and experimental studies of physically healthy subjects [10,11]. Psychophysiological research has demonstrated that the human respiratory rate is increased by physiological arousal, and in people with COPD the hyperventilation that results from anxiety markedly worsens shortness of breath by causing bronchoconstriction and lung hyperinflation [12–14]. Hyperinflation increases the work and effort of breathing, and reduces inspiratory reserve capacity [13,14]. The panic cycle in

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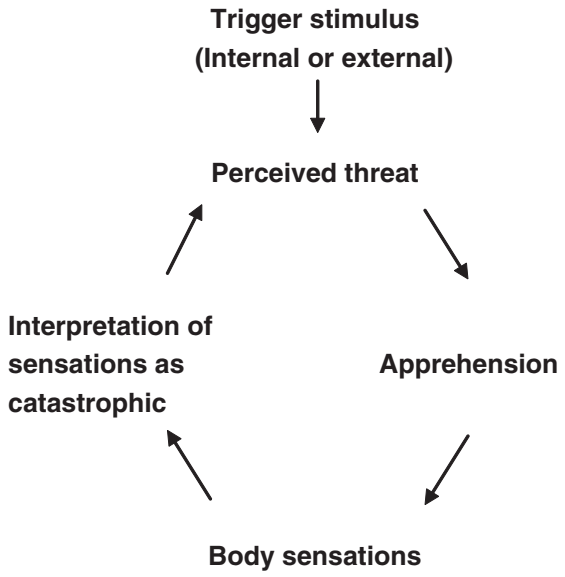

Fig. 1. Clark's model of the suggested sequence of events in a panic attack. From Clark (1986, p. 463).

COPD may be initiated when a precipitating stressor, such as an activity requiring physical exertion, causes an individual to perceive threat. Physiological arousal and hyperventilation follow, so worsening shortness of breath and increasing discomfort. Catastrophic overinterpretation of the immediate dangerous of the physical sensations being experienced (e.g. "This time I'll stop breathing and die") then leads to an escalating cycle of physical arousal and shortness of breath.

Some authors have begun to investigate the relationships between the high prevalence of panic-spectrum psychopathology (denoting current panic attacks or panic disorder) in people with COPD and the central tenets of the cognitive model of panic [15,16]. Two studies found increased rates of catastrophic cognitions about somatic symptoms in COPD patients with panic-spectrum symptoms, but both studies were weakened by not including formal diagnostic measures [17,18]. In a third study, hospitalized COPD patients formally diagnosed with panic disorder reported significantly higher levels of physical symptom perception than patients without panic disorder, with the limitation that patients were tested during an exacerbation of their illness [19]. As would be predicted by the cognitive model, COPD patients diagnosed with panic-spectrum psychopathology have also reported more shortness of breath in response to inspiratory resistive loading than did patients without panic [20,21].

In 2001 it was suggested that the use of measures of catastrophic interpretations distinct from measures of panic itself would allow the most definitive tests of the cognitive model [22]. A measure developed specifically for use with respiratory patients, the Interpretation of Breathing Problems Questionnaire (IBPQ) fulfills this criterion [23]. The IBPQ assesses the perceived consequences of experiencing COPD-related symptoms, and how catastrophic these consequences would be, in a series of illness-related scenarios. A typical scenario is: "You are on a long walk on your own, and you notice you are short of breath". The severity of catastrophic cognitions in a sample of 37 respiratory patients (20 with COPD) was significantly associated with higher anxiety about symptoms, and higher general anxiety. Severity of catastrophic cognitions was a better predictor of symptom-related and general anxiety than were demographic and disease factors [23]. This initial study was limited by not including formal diagnostic measures, but the findings provided support for the relevance of the cognitive model of panic-spectrum psychopathology in COPD. Subsequent studies including these formal diagnostic measures have supported the usefulness of the questionnaire [7,24,25].

Anxiety sensitivity, the fear of bodily anxiety symptoms due to the belief that they are harmful, has been proposed as an important vulnerability factor for the development of panic disorder, other anxiety disorders, and depression, and the concept has triggered considerable research [26–30]. Anxiety sensitivity is regarded as a relatively stable trait variable that is distinct from trait anxiety [28]. It has usually been measured with the Anxiety Sensitivity Index (ASI) [27]. COPD patients with panic-spectrum psychopathology have been found to score significantly more highly (and in the clinical range) on the ASI than COPD patients without such psychopathology or healthy age-matched controls [21,24]. Clark's cognitive model and the anxiety sensitivity approach share the assumption that fearful interpretations of ambiguous body sensations and their consequences are pivotal in the occurrence of panic attacks [28]. Recent studies have provided support for the suggestion that anxiety sensitivity, as a trait variable, influences catastrophic interpretations when the trigger stimulus of an ambiguous physical sensation (e.g. shortness of breath) leads to a panic attack [10,31,32].

No studies of people with COPD have yet investigated factors predicting the presence of panic-spectrum psychopathology, despite its high prevalence in the disease. In the current study we aimed to test the importance of two factors associated with the cognitive model of panic, the catastrophic interpretation of shortness of breath and anxiety sensitivity, as predictors. We hypothesized that, consistent with the cognitive model, more catastrophic interpretations of shortness of breath and higher anxiety sensitivity would both be significant predictors of panic-spectrum psychopathology in COPD when variance shared with confounding variables was controlled. The potentially confounding variables included in the study were depressive symptoms, age, quality of life, stressful life events, disease severity, years since COPD diagnosis and body mass index.

2. Methods

2.1. Participants

The study sample was recruited to participate in a target treatment trial at a teaching hospital in Sydney, Australia [7], and the data used in the current study was collected as part of baseline assessment for that trial. The project was approved by University and Hospital ethics committees, and all participants gave written consent. The exclusion criteria were lack of literacy in English (due to the use of questionnaires unavailable in other languages) and the presence of any serious physical illness other than COPD. Consecutive patients ($n=96$) who had been diagnosed with moderate to severe COPD (Global Initiative for Chronic Obstructive Lung Disease stages II or III) were approached in a respiratory medicine clinic by the first author and invited to take part [33]. Sixty-two (65%) agreed to participate and underwent the assessment procedure.

2.2. Procedure

All participants attended the Hospital's Respiratory Medicine Department for assessment. A diagnostic interview and relevant questionnaires were administered by the first author, a clinical psychologist, as part of this assessment. Data on demographic and clinical variables was also collected. Participants returned to the Department on another day within a two week period for standard lung function testing, conducted by qualified technicians.

2.3. Measures

Panic attacks and panic disorder were identified using the Panic Disorder section of the Anxiety Disorders Interview Schedule for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (ADIS-IV), a clinical interview with excellent psychometric properties [34]. The Interpretation of Breathing Problems Questionnaire (IBPQ) was used to assess illness-specific catastrophic cognitions in patients with COPD by describing 8 potentially anxiety-provoking scenarios involving shortness of breath. Studies indicate that the measure has satisfactory