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Attribution bias underlying burns-induced anxiety symptoms

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ABSTRACT

Introduction: Burn injuries are a debilitating cause of morbidity and mortality associated with the long-term impact of psychological factors on quality of life. Accurate assessment of the differential impact of burn sequelae and anxiety is often complicated by the overlap between psychological and somatic symptoms in burns patients. The Beck Anxiety Inventory (BAI) is one validated psychometric tool for anxiety assessment. The primary objective of this study is to investigate whether utilising the BAI as a tool to assess for anxiety in burns patients is biased due to the confounding of symptoms of anxiety with the physical sequelae of a burn injury.

Methods: This is a single-centre, prospective, cross-sectional study. The study was conducted in accordance with the UK Good Clinical Practice guidelines (CAPP reference number 506). Patients were recruited over a three-month period from November 2016 to February 2017 and were offered a modified BAI questionnaire to complete. Patients were asked to indicate to what degree they attributed each symptom to their physical injury or their psychological state on a visual analogue scale (VAS).

Results: 50 patients, comprising 33 females (66%) and 17 males (34%), participated in the study with a median age of 33.5 years (range: 20-88). Date of injury spanned May 1991 to January 2017. Percentage of the total body surface area (%TBSA) affected by burn ranged from 1 to 86%. Patients attributed eight of the 21 self-report items within the BAI as being more physical than psychological in origin. The results reveal a statistically significant difference in patient VAS scores between physical (mean: 34.16, 95% CI: 29.04-39.28) and psychological (mean: 61.2, 95% CI: 56.33-66.17) BAI items, with $p < 0.0001$. In addition, patients with a facial burn injury were more likely to report 'face flushed' (Mann-Whitney U Test, $Z = -2.11$, $p < 0.05$) and patients with a hand burn injury were more likely to report 'hands trembling' (Mann-Whitney U Test, $Z = -2.52$, $p < 0.05$).

Conclusions: This feasibility study found preliminary evidence suggesting that the BAI may, in part, represent misattributed symptoms of cutaneous injury from burns. However, whilst our findings suggest an attribution bias, there is not enough evidence from this data to comment on whether its use should be restricted in burns patients. Further research is needed to formally quantify convergent and divergent validity through structured

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interviews. In addition, further research using other self-report tools of anxiety in burns patients would be useful to corroborate the prospect of biased and confounded anxiety scores.

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1. Introduction

Burn injuries are a debilitating cause of morbidity and mortality. They cause clear cosmetic and functional sequelae, often necessitating physical and aesthetic rehabilitation [1]. Surgery and physiotherapy form the core of burns treatment and can produce rapid, demonstrable improvements to the physical injury [2]. However, despite significant reduction in mortality from advances in specialised wound care and reconstructive surgical techniques, mental health remains a large contributory factor in the long-term quality of life (QoL) [3,4].

Several large studies have demonstrated a high prevalence of anxiety after burn injuries [3,4]. Deterioration in mental health after a burn injury is common, with 82% and 58% of patients reporting anxiety and depression, respectively [3]. Burn-related psychological disorders commonly present both acutely on admission to a burns unit or soon after discharge. This tends to be the most common presentation, with incidence dropping over 24 months. However, one study reported that almost half of their cases developed delayed-onset psychological distress over a year post-discharge [5]. Body image disturbance and pain secondary to a burn injury can impair social functioning as patients encounter emotional and psychosocial adjustment to the physical injury [6,7].

However, the psychological impact of a burn injury can be much less readily apparent. The multidisciplinary team (MDT) must remain vigilant in order to avoid overlooking clandestine psychological distress. This highlights the necessity of long-term surveillance of mental health symptoms. National Burn Care Standards (2013) [8] recommend routine psychosocial screening at admission and follow-up plans should be in place for all patients admitted to the Burns Unit. Standard practice in our service is to administer a questionnaire incorporating social support, coping strategies, appearance concerns, trauma and previous mental health as soon as patients are able to answer. Anxiety is not formally assessed at admission as it is more likely to capture a highly stressful moment in time, not an underlying condition or susceptibility. The service does offer a follow-up psychosocial screen three months after discharge, which does include the 7-item anxiety scale (GAD-7) [9], in addition to other measures. Patients scoring above this threshold are offered further assessment, treatment and onward referral as appropriate.

Accurately assessing symptoms of anxiety in burns patient is often difficult in practice due to the overlap between the somatic symptoms of anxiety and symptoms that are a physical manifestation of the burn. Anxiety disorders commonly precipitate autonomic symptoms and in the general population this can be a useful diagnostic feature. A prime example would be 'numbness and tingling', which could be caused by both autonomic stimulation and cutaneous injury.

The Beck Anxiety Inventory (BAI) [10] is one validated psychometric tool used in the general population to assess symptoms of anxiety. This tool encompasses a 21-item self-report assessment method whereby respondents specify the extent to which they have been bothered by each symptom item over the past week (Table 1) [10]. It is widely accepted as a method to acquire a purer measure of anxiety independent of symptoms of depression [11]. The BAI is subcategorised into somatic (items 1-3, 6-7, 9, 11-13, 15, 18-21) and cognitive (items 4-5, 8, 10, 14, 16-17) symptoms [10].

The primary objective of this study is to investigate and attempt to quantify any attribution bias from use of the BAI as an anxiety assessment tool in burns patients. We hypothesise that patients commonly experience the somatic items in the BAI, but would attribute these symptoms to their burn injury rather than as a result of anxiety.

2. Methods

2.1. Study sample

This is a single-centre, prospective, cross-sectional study performed among patients attending the Burns Unit and the Plastic Surgery Outpatient Department at Chelsea and Westminster (C&W) Hospital. The study was conducted in accordance with the UK Good Clinical Practice (GCP) guidelines (CAPP reference number 506). Patients attending appointments at the Burns Unit from November 2016 to February

Table 1 – The Beck Anxiety Inventory (BAI) encompasses a 21-item self-report assessment used for measuring the severity of anxiety in adults. Each item is rated on a scale from 0 (not at all) to 3 (severely) [10].

Items		
Numbness or tingling	Nervous	Difficulty in breathing
Feeling hot	Unsteady	Fear of dying
Wobbliness in legs	Terrified or afraid	Scared
Unable to relax	Feeling of choking	Indigestion
Fear of worst happening	Hands trembling	Faint/lightheaded
Dizzy or lightheaded	Shaky/unsteady	Face flushed
Heart pounding/racing	Fear of losing control	Hot/cold sweats
Standardised cut-offs		
0-9	Normal to minimal anxiety	
10-18	Mild to moderate anxiety	
19-29	Moderate to severe anxiety	
30-63	Severe anxiety	

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