Catastrophic thinking about pain increases discomfort during internal atrial cardioversion

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Abstract

Objectives: This study investigated whether pain catastrophizing is associated with distress and perceived disability in patients with atrial fibrillation, whether pain catastrophizing predicts pain and fear during a medical procedure of atrial cardioversion, and whether pain catastrophizing influences the effects of an opioid analgesic during internal cardioversion. **Methods:** A secondary analysis is performed upon data from a double-blind placebo-controlled trial during which the effect of intranasal butorphanol tartrate (INB) was evaluated in patients with atrial fibrillation using a step-up internal atrial cardioversion protocol. Before the procedure, patients completed measures of pain catastrophizing, mood, distress and perceived disability. After each shock, patients completed measures of pain and fear. **Results:** We found that pain catastrophizing predicted the affective pain rating of the first shock, and the fear increase during subsequent shocks. There was no effect of INB. However, when controlling for the differences in pain catastrophizing, INB significantly reduced fear as compared to placebo. This suggests that the effects of INB during atrial cardioversion were overshadowed by the effects of pain catastrophizing. **Conclusions:** It is recommended that in future atrial cardioversion trials, stratification based on pain catastrophizing be performed. Reducing catastrophizing thinking about pain through cognitive–behavioral techniques are likely to reduce levels of fear during internal atrial cardioversion and may increase the effectiveness of concomitant analgesics.
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Introduction

Despite its safety and efficacy, a medical procedure of internal atrial cardioversion can cause considerable discomfort, of which fear and pain are the most prominent [1]. A number of factors may contribute to the discomfort experienced during the cardioversion procedure, among which are skeletal muscle contractions, peripheral nerve stimulation and psychological factors [2]. One of the psychological factors that have received considerable attention during the last decade is catastrophic thinking about pain, which is defined as an exaggerated negative orientation toward noxious stimuli [3]. Pain catastrophizing has been shown to mediate distress reactions to painful stimulation. In fact, individuals who catastrophize about pain consider physical sensations and pain to be more threatening than low pain catastrophizers. Using the Pain Catastrophizing Scale (PCS [3,4]), Crombez et al. [5] found that pain-free volunteers with a high frequency of catastrophic thinking about pain became more fearful when threatened with the possibility of occurrence of an intense electrocutaneous pain stimulus than subjects with a low frequency of catastrophic thinking. It has been suggested that in patients who are treated with an implantable cardioverter/defibrillator, the catastrophic interpretation of bodily sensations is the main precursor of distress [6]. To our knowledge, there are no studies that have specifically

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examined the role of pain catastrophizing in patients receiving intracardiac shocks.

This study is a secondary analysis of a randomized placebo-controlled trial to examine the effects of intranasal butorphanol tartrate (INB), a synthetic opioid analgesic, on pain and fear during atrial cardioversion [1]. First, we wanted to evaluate the association between pain cata-strophizing and measures of distress and perceived disability in a sample of patients with atrial fibrillation. Second, we wanted to investigate whether pain and fear during a procedure of internal atrial cardioversion is affected by baseline pain catastrophizing. It was hypothesized that pain catastrophizing in patients with atrial fibrillation is corre-lated with pain and fear during the first shock as well as with pain and fear increases during subsequent delivery of shocks with increased energy, even when controlling for treatment condition (INB vs. placebo). Third, we wanted to explore whether pain catastrophizing influences the effects of an opioid analgesic during a medical procedure of internal cardioversion.

Methods

Participants

Of 47 consecutive patients who underwent internal atrial cardioversion, the 35 last patients (22 men, 62 ± 12.4 years) were asked to complete a number of questionnaires before starting the procedure. For logistic reasons, no question-naires were administered in the first 12 patients. There were no dropouts. Based on the randomization scheme, 19 patients received the analgesic, while 16 patients were assigned to the placebo condition. The inclusion and exclu-sion criteria of this study have been described previously [1]. The Medical Ethics Committee of the Academic Hos-pital Maastricht approved the study protocol, and written informed consent was obtained from all patients.

Measures

Pain catastrophizing

A Dutch version of the PCS [3,4] was used in this study. This is a 13-item questionnaire developed for both non-clinical and clinical populations. Subjects reflect on past painful experiences and indicate the degree to which they experienced negative thoughts or feelings during pain on a five-point scale (e.g., "I can't seem to keep it out of my mind," "I feel I can't stand it any more"). This Dutch version of the PCS has proven to be psychometrically sound [7], but it has never been used in patients with cardiovas-cular disease, and with atrial fibrillation in particular.

Health complaints

Current health complaints were assessed with the Health Complaints Scale (HCS) [8]. The HCS consists of somatic (such as fatigue, shortness of breath, pain) and cognitive complaints (such as fear of illness, worrying) that are frequently reported by patients with coronary heart disease. The respondent is requested to rate the extent to which he/she is bothered by each health com-plaint. The psychometric properties of the HCS are satisfactory [8].

Mood

Both negative and positive mood states were assessed by the Global Mood scale (GMS) [9] and the well-being scale and distress scale of the Heart Patients Psychological Questionnaire (HPPQ) [10]. The GMS is a brief and easy-to-complete questionnaire that consists of 10 negative and 10 positive mood terms. The respondent rates on five-point scales the extent to which he/she has experienced each mood state lately. The scale has been developed specifically for cardiac patients and is a psychometrically sound measure in terms of construct validity, internal consistency and test–retest reliability [10]. The HPPQ comprises items that address the discrepancy between the time before and after onset of an acute coronary event, and consists of 52 items that can be scored on a three-point scale (agree, ?, disagree). Four factors have empirically been derived: well-being, disability, distress and social inhibition. Both reliability and validity of these scales have been found satisfactory.

Disability

The level of self-reported disability was assessed with the Disability scale of the HPPQ [10].

Pain

The McGill Pain Questionnaire (MPQ) [11] is widely recognized as a valid and reliable instrument to measure pain, with a Dutch language version (MPQ-DLV) [12] available. The MPQ-DLV contains 20 subclasses of three to four pain descriptive words arranged in progressively increasing intensity. The list of words is scored according to the method described by Melzack [11]. Two major indices are obtained: the pain rating index (PRI) and the number of words chosen (NWC). Because of the high correlation with the NWC, only the PRI was used for further analyses. The PRI is based on the rank values of the words. The values of the words chosen by a patient are then added up to obtain a score separately for the sensory (PRI-S), affective (PRI-A) and evaluative (PRI-E) words, as well as a total score (PRI-T). Example of pain adjectives are shooting, burning, pounding (sens-ory), exhausting, punishing (affective) and horrible, and unbearable (evaluative).

Fear

For the measurement of fear experienced during each shock, a visual analogue scale (VAS-F), with 0 and 100 at the extremes, was used.