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Do psychological factors influence pain following a fracture of the extremities?

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Abstract

We studied the role of psychological factors on pain following a fracture of the extremities in older adults (n = 111) using a prospective design. Pain and psychological variables measured at baseline, postfracture anxiety and depression, and demographic variables were used to predict pain two months after the fracture. Both moderately severe and serious fractures lead to an increase in pain. Pain at baseline and postinjury anxiety were associated with pain following a fracture of the extremities.

1. Introduction

Fractures of the extremities occur commonly in the elderly population, and have a considerable impact on patients’ subsequent functional capacity, state of dependency and ability to live in the community [1]. Patients with such fractures may also suffer a great deal of pain [2]. Research suggests that pain is affected by psychological factors. For instance, postoperative pain in surgical patients is associated with preoperative anxiety [3], postoperative anxiety [4] and neuroticism [5]. Psychological variables also play a part in the development of chronic forms of pain. For example, Dworkin et al. [6] found that anxiety and disease conviction during the acute phase of herpes zoster were predictors of chronic herpes zoster pain.

The present study was conducted to examine the relationship between psychological variables and pain following a fracture of the extremities in elderly patients. Based on research with surgical and herpes zoster patients, we expected that anxiety and neuroticism would show an association with postfracture pain.

2. Methods

2.1. Patients

This investigation is part of a longitudinal aging study on functional status and well-being in the elderly. Baseline data on 5279 community-dwelling older adults (\geq 57 years) living in the northern parts of The Netherlands were collected in 1993. Participants who sustained a fracture of the extremities after the baseline, were invited for an interview approximately two months postfracture. By the end of 1996, 111 patients with fractures of the extremities had been studied. Our sample consisted of 75 patients with relatively mild injuries (e.g. wrist and ankle fractures) and 36 with serious injury (i.e. hip fracture).

2.2. Dependent measure

Postinjury pain was selected as the dependent...
variable. Patients were administered the subscale ‘bod-
ily pain’ from the Dutch version of the MOS Short-
Form General Health Survey (SF-20) [7], both at base-
line and 2 months postfracture.

2.3. Independent measures

We used a range of independent variables: (a) age at
two months postfracture, (b) sex, education, religiosity,
extraversion and neuroticism, anxiety, depression,
social support, perceived control (over the environ-
ment) and self-confidence measured at baseline, (c)
anxiety and depression measured two months follow-
ing injury. Religiosity was measured with a five-point
scale (1 = very religious, 5 = antireligious). The Dutch
version of Eysenck’s Personality Questionnaire —
Revised [8] was used to assess extraversion and neur-
oticism. Anxiety and depression were measured with
the Dutch version of the Hospital Anxiety Depression
Scale [9]. We used the SSL12-I [10] to determine levels
of social support. Perceived control was assessed with
a scale developed by Pearlin and Schooler [11]. Self-
confidence was measured with the Dutch version of
Sherer’s scale [12].

2.4. Data analysis

First, we used a paired t-test to determine whether
— in the total sample — mean postfracture level of
pain was higher than baseline level. Next, increase in
pain between the two patient groups was compared
using a t-test. Finally, forward stepwise linear multiple
regression was used to find out if any of the independ-
ent variables contributed to postfracture pain score.

3. Results and discussion

Mean (S.D.) age of the patients was 72.0 (8.0) years.
Mean (S.D.) pain score was 31.3 (30.4) at baseline and
38.5 (30.0) postfracture (t(110) = 2.18, p < 0.05). Mean
(S.D.) increase in pain was 9.7 (34.6) for patients with
moderately severe fractures and 2.1 (35.0) for those
with serious injury (t(109) = 0.28, ns). Table 1 shows
the association between the independent variables and
the dependent variable. There were two significant pre-
dictors of pain score two months postinjury: pain at
baseline and postfracture level of anxiety. The other
variables were not associated with pain measured two
months postinjury.

The results can easily be summarized. Elderly
patients experience more pain after a fracture of the
extremities. Moreover, fractures of the wrist or ankle
(moderately severe injuries) seem to cause as much
pain as hip fractures (a serious fracture). Baseline level
of pain is associated with pain following injury to the
extremities. Psychological factors — with the exception
of postfracture level of anxiety — do not play a role
in pain after a fracture of the extremities.

It is difficult to tell whether postfracture pain is
affected by anxiety or vice versa. In surgical patients,
preoperative anxiety does influence postoperative level
of pain [3]. It is therefore possible that pain in patients
with injury to the extremities is — at least to a certain
degree — influenced by level of anxiety. This could
have implications for clinical practice. Reducing
anxiety in patients with fractures of the extremities, for
instance with relaxation training, may also lower their
level of pain. Future research is indicated to shed more
light on the effect of anxiety reduction on pain follow-
ing injury to the extremities.

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