

The preoperative evaluation of pain management—a new approach!

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Abstract

Pain is inadequately managed on the day surgery unit, analgesia being mostly prescribed on the basis of the procedure to be performed. We have recently reported the first attempt to quantify an individual's response to a standard pain by measuring their pain response parameters (pain threshold, pain tolerance and pain sensitivity range) using pressure algometer and cold pressor tests, and then analysing their pain with the short form McGill pain questionnaire (SFMPQ) [5]. We report here that the SFMPQ does provide additional information about an individual's pain response in comparison to just measuring pain response parameters alone. Together with the pressure algometer test the SFMPQ provides a quick and practical method of assessing pain sensitivity preoperatively. © 1997 Elsevier Science B.V.

Keywords: Pain management; Pressure algometer; Cold pressor; Short form; McGill pain questionnaire

1. Introduction

The management of postoperative pain in the day unit has been shown to be a significant problem by several authors. The introduction of local anaesthesia and sedation/local anaesthesia techniques has made the subject of preoperative pain management of paramount significance. In this paper we discuss the use of preoperative pain assessment techniques and their relevance to the day surgery unit.

Pain represents a category of experiences signifying a multitude of different unique experiences having different causes and characterised by different qualities, varying along a number of sensory, affective and evaluative dimensions [1].

In everyday clinical practice pain is not quantitatively measured, a subjective report with an objective opinion is most often used. Eysenck [2] has shown that introverts have a lower pain threshold than extroverts but complain less, and Libman [3] was among the first of many to show that individuals feel differing amounts of pain when a standard stimulus is applied.

Pain can be measured physiologically by any of several standard pain tests [4], which for example are used to assess the efficacy of new analgesics. Pain response parameters, namely:

Pain threshold (P.Th)—the point at which pain is just perceived during an ascending series of stimuli.

Pain tolerance (P.Tol)—the point at which a subject will terminate or withdraw from noxious stimulation.

Pain sensitivity range (PSR)—the arithmetical difference between pain tolerance and pain threshold.

provide a measure of an individual's pain reaction.

We have recently reported the use of two standard pain tests, cold pressor and pressure algometer in the population attending the Whittington hospital [5]. For the general population the pain response parameters measured, for both pressure and cold pain tests correlated significantly. Following each pain test a short form McGill pain questionnaire (SFMPQ) was completed [6]. This takes a couple of minutes to administer and provides qualitative information on sensory and affective aspects of pain, SFMPQ scores for both pain tests correlated significantly.

The above would suggest that only one of these tests need be used. The pressure algometer is quick, causes

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less discomfort to patients than the cold pressor test and is more practical in its administration. However the question of whether the SFMPQ provides any more information about an individuals pain response, in comparison to the pain response parameters alone, has not been reported for these standard pain tests. The aim of this paper was therefore to assess these two aspects of pain measurement to show whether or not in routine testing in a hospital taking a SFMPQ is helpful.

2. Method

People, 240 (129 males, 111 females) attending the Whittington hospital as inpatients, outpatients, day surgery unit patients, visitors and staff were invited to participate in the study, by simple randomisation. A health questionnaire was then completed by the researcher (AY), recording details of age, sex, ethnic origin and chronic pain status (defined as pain most days of the week, most weeks of the year, for at least 1 year). Following an explanation of the study, the two pain tests were then performed:

2.1. Pressure algometer test

The electronic pressure algometer (Fig. 1, Force Five Multi-Capacity Force Gage, model FDV 30, Wagner Instruments, P.O. Box 1217, Greenwich, CT 06836) was applied to the anteromedial shaft of the right tibia 5–8 cm below the tibial tubercle. The subjects were asked to tell the examiner to stop when they felt the first sensation of pain or discomfort (P.Th) and were then asked to put up with the pain until they could bear it no more (P.Tol). Two practice tests were performed on the left shin first to familiarise the subjects with the feelings. Three P.Th and P.Tol readings were taken at different sites in the measured region, and the average of these taken. The test was stopped if the subject tolerated a pressure of greater than 150 N.



Fig. 1. The new electronic pressure algometer. Model FDV 30, Wagner Instruments.

Table 1
Linear regression, stepwise method for the pressure and cold pain descriptors, with pressure/cold tolerance as the dependent variable

	Pressure/cold tolerance		
	B	95% Confidence interval	P value
Pressure descriptor total	-0.827	-0.063--1.591	0.0350
Pressure VAS	-3.647	-1.602--5.694	0.0006
Cold VAS	-5.112	-2.825--7.399	<0.0001

B, slope of the regression; VAS, visual analogue score.

2.2. Cold pressor test

A variation of the standard technique described by Wolff [7] was used. Subjects immersed their hand to the wrist in a luke warm water bath for 2 min (to serve as a common baseline) and then transferred their hand to an ice/water bath at 0°C, when the timer was started. The subject pushed a hand held button when they first identified the feeling of pain/discomfort (P.Th) and removed their hand when they could bear it no more (P.Tol). A maximum safety limit of 3 min was allowed in the cold water bath. (See [5] for a detailed methodology).

A SFMPQ was then completed to describe the pain at the subjects pain tolerance level. It consists of 15 descriptor's (11 sensory and 4 affective), a visual analogue scale (VAS) and a present pain index (rating no pain as 0 and excruciating pain as 5). Each descriptor can score 0 indicating no pain, 1 - indicating mild pain, 2 -indicating moderate pain, 3 - indicating severe pain. Hence the three descriptive sections, sensory, affective and total, score 0–12, 0–33 and 0–45 respectively. The VAS scores 0–10.

2.3. Statistics

The statistics package used was in windows 3.1 SPSS 6.0, using linear regression with the stepwise method to analyze the results. Sex, age, ethnic origin, chronic pain status as well as the pressure or cold pain descriptor's were considered as possible variables in the regression.

3. Results

3.1. Pressure algometer test

Pressure pain tolerance was only related to the total descriptor score and the VAS score (Table 1) i.e. those with a high pain tolerance had a low total descriptor score and a low VAS score—they reported less pain despite putting up with more than those with a low

pain tolerance. The variables for the affective score, sensory score, ethnic origin and chronic pain status were not significantly related to the pressure tolerance. Sex and age were significantly related to pressure tolerance, this has been previously reported [5].

3.2. Cold pressor test

As cold pain tolerance increased, the VAS score decreased (Table 1). Hence those with a high pain tolerance reported less pain on the VAS, despite experiencing more. Variables for the verbal descriptors, age and ethnic origin were not significantly related to the pressure tolerance. Sex and chronic pain status were significantly related to cold tolerance, this has been previously reported [5].

4. Discussion

These results show that measuring an individuals pain tolerance would allow one to predict some aspects of the SFMPQ, however for both pain tests sensory and affective components cannot be predicted, i.e. it is possible to glean additional information about an individuals pain response with the questionnaire.

The more information one has about an individuals pain response preoperatively the better the chance of achieving satisfactory pre and postoperative pain management. Nurses measure temperature, BP, pulse and weight when a patient is admitted to hospital. No attempt has been made to quantify an individuals response to pain in this setting. The pressure algometer test takes about 3 min in total to complete, and could form part of a nursing assessment programme. To-

gether with a SFMPQ, this could identify individuals requiring greater amounts of analgesia, sedation and reassurance.

Sex is a highly significant factor in pain response [5]. It should be noted that pain response parameters in females are lower than in males [5]. It has recently been shown that sex differences exist in analgesic response [8]. These differences must be taken into account by clinicians.

We are currently constructing nomogram tables which will be used to plot the patients pain response numerically and determine mathematically significant figures to indicate a comparison of the patient with a control population. This would allow the pain management of an individual to be tailored to their needs more appropriately.

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