Factors affecting pain in burned patients—a preliminary report

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Summary

Twenty-six patients in a burn unit were given the McGill Pain Questionnaire, Illness Behaviour Questionnaire, State-Trait Anxiety Inventory, Zung self-rating depression questionnaire and visual graphic rating scales of pain, depression and helplessness. Preliminary results indicate significant pain and anxiety related to procedures such as debridement, physiotherapy and skin-grafting. Depression occurred in one third of patients and was associated with prolonged stay in hospital and complicated surgical course. The instruments used in this study are suitable for assessing pain and factors affecting it.

KEY WORDS: burns, pain, anxiety, depression, analgesia.

Introduction

Pain is a constant feature of burns and their treatment. Severe pain may be experienced by burned patients after the initial injury, or associated with procedures such as debridement, physiotherapy or surgery. This study attempts to measure the pain quantitatively and to assess the contribution of such factors as depression, anxiety and helplessness.

Materials and methods

Twenty-six patients admitted to the Burn Unit at Harborview Medical Center were included in this study. Patients falling into the following categories were excluded: (1) Patients younger than 14 years, as there is evidence that children respond to pain in a different fashion from adolescents and adults (Save-dram, 1977; Steiner and Clark, 1977). (2) Patients whose injuries were severe enough to preclude normal communication for over 6 days. (3) Patients whose time as an in-patient was too short to allow reasonable data to be collected. (4) Patients with

whom communication was a problem by reason of language or mental ability.

Patients completed the McGill Pain Assessment Questionnaire (Melzack, 1975) and Illness Behaviour Questionnaire (Pilowsky and Spence, 1976) at weekly intervals. The State-Trait Anxiety Inventory, (Spiel-berger, 1972), a self-rating depression questionnaire (Zung, 1965) and visual graphic rating scales of pain, depression and helplessness were completed more frequently. An attempt was made to relate the time of completion of the test instruments to procedures likely to cause an increase in pain such as debridement or physiotherapy.

The McGill Pain Assessment Questionnaire uses 20 major groups of adjectival descriptors to enable patients to identify the particular components of their pain. Numerical rank values have been assigned to the words chosen and enable a measurement of quantity to be made in addition to giving an assessment of the subjective quality of the pain from experience. The adjectives used are the result of an earlier study on the language of pain (Melzack and Torgerson, 1971) and are grouped in 20 subclasses. Each subclass describes a particular aspect of the pain experience. The classes are: (1) words that describe the sensory qualities of the experience in terms of temporal, spatial, pressure, thermal and other properties; (2) words that describe affective qualities, in terms of tension, fear and emotion; (3) evaluative words that describe the intensity of the pain and (4) a miscellaneous group of words that belong to none of the previous groups but which are felt to be necessary for patients to describe their pain adequately and comprehensively.

In addition to the list of pain descriptors, the overall present pain intensity (PPI) is recorded as a number from 1 to 5, in which each number is associated with the following words 1, mild; 2, discomforting; 3, distressing; 4, horrible; 5, excruciating.

The Illness Behaviour Questionnaire was developed by Pilowsky and Spence to measure the concept that illness behaviour was a suitable explanation for the behaviour of patients who persistently complained of pain in the absence of adequate pathology. It is a 52-item questionnaire with responses scored on 7 scales: general hypochondriasis, disease conviction, psychological versus somatic perception of illness, affective inhibition, affective disturbance, denial and irritability.

The State-Trait Anxiety Inventory was developed to provide reliable, relatively brief self-report measures of both state and trait anxiety. In simple terms, state anxiety may be expressed as the actual anxiety experienced by the patient at the time of questioning; trait anxiety is a measure of relatively stable individual differences in anxiety proneness. Item selection and validation procedures for the State-Trait Anxiety Inventory are described in detail by Spielberger, Gorsuch and Lushene (1970).

A self-rating depression questionnaire (Zung, 1965) and visual graphic rating scales of pain, depression and helplessness (Scott and Huskisson, 1976), completed the instruments used.

Results

Results are based on information collected from 26 patients, but not all patients completed all ratings or questionnaires so the information reported is incomplete. The number of patients who supplied information is reported where appropriate.

Demographic data about the patients and their burns are shown in Table 1. The majority of patients were young men who were burned accidentally. The extent of the burn ranged from 1 to 37%. The distribution was skewed as there were a small number of large surface area burns and a large number of small area full-thickness burns. The median percentage burn was 11%.

TABLE 1. Demographic data

Number of patients	26 (male 24)	
Median age	30 (range 14–61)	
Cause of burn	Accidental 25	Self-inflicted 1
Type of burn	Flame 16	
	Scald 5	
	Electrical 2	
	Miscellaneous 3	
Percentage of total body area burned—Median 11% (range 1–37%)		
Number of patients requiring operation(s)	16	
Number of patients with previous psychiatric problems	4	
Number of patients with psychiatric problems during admission	8	

Sixty-two per cent of the patients required at least one surgical procedure during their hospital stay. Fifteen percent of patients had been treated for some form of psychiatric illness before admission and 31%

developed psychiatric problems whilst being treated as an in-patient.

McGill Pain Questionnaire

Three types of data have been obtained from this questionnaire. (i) Pain rating index (PRI) based on the rank values of the words. In this scoring system, the word in each set of adjectives implying the least pain is given a value of 1, the next word is given a value of 2, etc. The rank values of every word chosen are added up and a total score for all categories obtained. (ii) The number of words chosen (NWC). (iii) The present pain intensity (PPI). This is the number-word combination chosen to indicate the intensity of the pain at the time the questionnaire was administered.

Table 2 shows the results of the McGill Pain Questionnaire in burn patients compared to other groups of chronic pain patients (data derived from Melzack, 1975).

TABLE 2. McGill Pain Questionnaire

Patient group	Number	PRI*	NWC*	PPI*
Burn	18	22.6	11.1	1.8
Post-herpetic neuralgia†	5	22.6	10.4	3.0
Arthritis†	19	18.8	8.1	1.9

*See text for explanation of columns and figures; †from Melzack (1975).

Illness Behaviour Questionnaire

Data obtained from this did not indicate any change in the patient's illness behaviour with a prolonged stay in hospital. Unsurprisingly, it showed strong disease conviction, denial and irritability.

TABLE 3. State-Trait Anxiety Inventory Scores—results given as mean (s.d.)

Group	State	Trait
Burn patient	42.9 (8.6)	39.7 (10.0)
College students (Male)	40.0 (7.9)	38.1 (8.2)
Neuropsychiatric patients	47.7 (13.2)	46.6 (12.4)
General medical/surgical patients	42.4 (13.9)	41.9 (12.7)

State-Trait Anxiety Inventory

Measures of anxiety were provided by this test which was completed by 17 patients. This instrument produces 2 scores for each patient: a state score which measures the patient's anxiety at the time of testing and a trait score which measures the patient's predisposition to become anxious under stress.

The mean scores and standard deviations (s.d.) are shown in Table 3 together with similar data for

college students, general medical and surgical patients and neuropsychiatric patients (Spielberger *et al.*, 1970).

Depression questionnaire and visual graphic rating scales

Two measures were obtained of the patient's level of depression: the Zung self-rating scale and a visual graphic rating scale. Visual graphic rating scales of pain and helplessness were taken at the same time as that for depression. Attempts were made to relate these measurements to procedures regarded as likely to be painful to the patient. However, since the number of observations varied widely with different patients, no attempt has been made to relate changes seen to the time of observation for this report. Instead mean scores were calculated for each subject.

Results suggest that a similar picture is shown by the visual graphic rating scales for depression and helplessness and the Zung self-rating questionnaire. The majority of burn patients were only minimally or mildly depressed while a small number were appreciably depressed. The mean score in the Zung scale was 46.9, which, according to Zung's norms is in the range of minimal-mild depression. About one-third of the sample (7/21) had scores in the moderate to severely depressed range. The same distribution was seen with the visual graphic rating scales.

The visual graphic rating scales for pain nearly all showed mild pain except for a small group who reported severe pain. This was not always associated with a painful procedure but seemed to be related more closely to self-report of depression.

Discussion

This study was carried out in a large American burn treatment centre, but there is every reason to believe that the findings are applicable to burn patients anywhere. A recent survey of management of pain during debridement by Perry and Heidrich (1982) showed enormous difference in the way pain control was achieved. Little or no attention was paid to other factors that may influence the report of pain. Although psychotropic agents were used freely no comment was made about the rationale for their use.

The results of the McGill Pain Questionnaire show that burn patients' report of pain varies with the measure used. On the PRI and NWC scales, the burn patients most closely resemble patients with pain due to post-herpetic neuralgia. On the PPI, however, the burn patients most closely resemble patients with arthritis. This apparent disparity can be accounted for by consideration of the clinical course of the burned patient. The severe pain of

debridement, tanking or after a surgical procedure being of relatively short duration and being followed by a period of 'chronic' pain resembling that of arthritis.

Despite the fact that many burned patients undergo prolonged stays in hospital, no illness behaviour has been seen. The strong disease conviction, denial and irritability seen on the illness behaviour questionnaire are to be expected. They have a clearly defined injury from which, in the long-term, they can be expected to recover fully and are extremely irritated at the circumstances of their injury. However, many patients' complaints increase as treatment progresses and burn patients as a whole are often regarded as being very demanding. This is probably a reflection of anxiety about their prospects of recovery, social status and future employment, especially in the case of larger burns, or burns involving the hands, face and genitalia. Illness behaviour probably only applies to many of the numerous patients with psychiatric disturbances seen in pain clinics everywhere (Merskey, 1980).

The State-Trait Anxiety Inventory results show that the state anxiety of the burn patients was very similar to that seen in a general medical/surgical population. The trait anxiety was similar to that seen in a population of unstressed male college students. The reason for the slightly lower trait anxiety scores may be that the burned patients were largely unskilled manual workers of relatively lower education. A few patients showed extremely high state anxiety scores and all of these had pain problems that were difficult to manage.

Clinically significant depression was seen in one-third of the patients in this study. In all cases, this was manifest on both the self-rating depression questionnaire and the visual graphic rating scales of depression and helplessness. In many of these cases, the extent of the depression was not obvious to the personnel of the burn unit, who merely thought that the patients were being 'difficult'. Patients who had prolonged stay in hospital, a complicated clinical course requiring multiple surgical procedures and, to a lesser degree, those with a previous history of psychiatric illness were far more likely to become significantly depressed.

Because of the small numbers involved in this study and the incomplete nature of the data, any conclusions must be tentative. However, certain conclusions can be made for the management of analgesic requirements for burned patients.

The majority of pain suffered by burned patients is associated with procedures such as debridement of wounds, physiotherapy and grafting operations. Substantial premedication with opiate analgesia plus the use of patient-controlled 'on-demand' nitrous oxide/oxygen mixtures can do much to mitigate the amount

of pain involved. Postoperatively, 'on-demand' analgesia computers can be utilized if the patients cerebral status permits.

Opiate analgesia should be accompanied by the judicious use of anxiolytic agents. Preference should be given to those such as hydroxyzine that have analgesic properties of their own rather than those such as the benzodiazepines that are regarded by most pain relief clinics as antanalgesic.

There is a strong case to be made for the presence of a psychologist or psychiatrist as part of the regular personnel of any burn unit. The consistent application of behavioural principles can have significant effects upon the behaviour of both patients and staff to the benefit of both (Klein and Charlton, 1980). In addition, availability of such personnel may aid rapid diagnosis in those patients with psychiatric problems or even allow pre-emptive intervention in patients thought to be at risk. The instruments used in this study provide a useful, albeit somewhat crude, method of assessing psychological factors associated with burns and may be helpful in those units where psychiatric or psychological help is not routinely available.

A small but significant number of burned patients have pain that is difficult to control and there is still a consistent tendency of medical and nursing staff to undertreat pain (Marks and Sachar, 1973; Cohen, 1980). Both groups of staff have a poor knowledge of the analgesic properties and length of action of the drugs employed and, in addition, consistently over-emphasize the dangers of addiction. Inadequate analgesia may be made even worse by failure to

appreciate and treat other factors such as anxiety and depression.

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