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Prevalence of pain in a public hospital: correlation between patients and caregivers

Received: 5 March 2001

Accepted in revised form: 28 August 2001

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Abstract The prevalence of patients suffering pain in hospital is high. This situation is censured during congresses on the study and treatment of pain, which highlight how little consideration the problem is given. Our study, which measured exactly how far pain is underestimated and inappropriately treated, took place as part of the project “Towards a Pain-Free Hospital” in San Bortolo Hospital, Vicenza. Data were collected by means of a questionnaire consisting of 5 questions and 2 numeric scales concerning the presence of pain, its intensity and its causes, and on the type of treatment received. Data were collected for each patient regarding their sex, the ward they were in, the type of analgesics used and how they were taken. Prevalence of pain in this study was 44% (95% CI, 41%–48%). It was higher among women than men (47% vs. 41%), as it was in the 62–72 years age group (49.7%) compared to other age groups and in the surgical wards as opposed to general medicine wards, without there being, however, a sig-

nificant difference between groups. There was little agreement between patients’ perceived pain and nurses’ interpretation of their pain (Cohen’s $k = 0.17$, 95% CI, 0.09–0.25); these findings show a tendency for caregivers to underestimate the patient’s pain. Among those patients in pain, 59% were taking analgesics. Of these, 67% were taking them only on a prn basis, 20% at fixed times and 12% both at fixed times and on a prn basis; 82% were being treated only with non-steroidal anti-inflammatory drugs (NSAIDs), 8% only with opioids, and 3.7% with both. Of the patients using NSAIDs, 72% were taking them on a prn basis, while 86% of those using opioids were taking them according to a fixed schedule. These data are rather disappointing as they indicate a certain negligence towards patients (40% of patient with pain were not treated) and an inappropriate use of analgesics.

Key words Pain prevalence • Pain assessment • Pain treatment

Introduction

Despite progress in the study and treatment of pain, the prevalence of patients suffering pain while in hospital continues to be high [1–8]. Roughly 50% of hospitalized patients suffer from significant pain [1, 6–11], in particular those with acute pain and cancer pain [12, 13]. This situation is cen-

sured during congresses on the study and treatment of pain, which highlight how little consideration the problem is actually given [14]. This happens particularly with regard to the most marginalized and least protected groups:

- Patients with brain damage,
- Children and the elderly [15, 16],
- Ethnic minorities.

It is widely held that pain is an intrinsic part of an illness, it may be useful for its diagnosis and therapy, but it has been proved how this can negatively influence the quality of life of the patients, the prognosis and the possible success of the treatment [17].

Among the most common and well-known reasons for such negligence are:

1. The belief that pain is natural and must be respected and tolerated,
2. The belief that patients overestimate the intensity of pain [18],
3. The widespread notion that it is impossible to quantify pain intensity or the level of response to therapy [19, 20],
4. The exaggerated fear of addiction to narcotic analgesics [21],
5. The inability to identify pain etiology,
6. The lack of regulations concerning pain therapy,
7. The under-use of appropriate therapeutic techniques,
8. Insufficient communication between doctors, nurses and patients.

This study aimed to measure exactly how far pain is underestimated and inappropriately treated.

Patients and methods

The study took place as part of the project "Towards a Pain-Free Hospital" (<http://www.sans-douleur.ch>) in San Bortolo Hospital, Vicenza (Italy). With the authorization of the Local Health Authority and the nurses' organization, the study was discussed at all levels (doctors and registered nurses) in the departments of the hospital. The organization, roles and responsibilities of those involved are shown in Table 1. After careful organization, the interview took place on 22 September 1998.

Eligibility criteria for the interview were the following: patients had to have been present in hospital for at least 24 hours; children under 5 years of age and patients in coma were excluded from the study; consent was asked for participation.

Data were collected by means of a questionnaire consisting of 2 numeric scales (Lickert scale, ranging from 0 to 10 where 0 is the

Table 1 Organizational model: roles and responsibilities

Organization Committee
Project planning
Discussions with Departments
Training of data collectors
Survey organization
External communication (citizens and caregivers)
Publication of results
Epidemiology Department
Processing and statistical analysis of data
Data collectors
Conduct the survey

total absence of pain and 10 is the worst pain imaginable) and 5 questions concerning the presence of pain, its intensity and its causes, and on the type of treatment received. The questions were:

1. How can you rate the intensity of our present pain on a scale from 0 to 10, where 0 represents no pain and 10 represents the worst pain you can imagine?
2. What is the duration of your pain?
3. Are you taking any pain killer?
4. Has a consultation with the Pain Unit been requested?
5. Which is the cause of pain: surgery, trauma, diagnostic procedures, cancer or other?

Data were collected for each patient regarding their sex, the ward they were in, the type of analgesics used, the dosing regimen, the cause of pain, and whether or not a consultation with the Pain Therapy Unit had been requested. For each patient, the intensity of pain was estimated by a registered nurse (RN) in each ward on a 10-point scale. A total of 44 RN participated in the study, one for each of the 43 units present in the hospital while one acted as a coordinator; 34 were women and 10 men. Most were between 25 and 35 years of age and had worked in that particular ward for at least 12 months. Immediately after, the patients scored their intensities of pain on a separate sheet, provided by a student nurse.

Data analysis

For the purposes of statistical analysis, Student's *t* test, one- and two-way analyses of variance and the chi-squared test were used, as required. To measure how far the nurses' and patients' judgements of pain intensity corresponded, pain intensity was divided into categories (0, no pain; 1–3, slight pain; 4–7, mild pain; 8–10, intense pain) and Cohen's *K* was calculated [20]. Descriptive statistics for age were expressed as median and interquartile range, as the variable was not normally distributed. The statistical software SPSS for Windows 8.0 was used.

Results

There were 761 eligible patients present on the day of the interview; 718 (94%) agreed to participate in the study (Table 2). Only 43 patients, evenly distributed in the various wards, did not consent because of extreme asthenia or a mild cogni-

Table 2 Characteristics of the 718 patients who participated in the study

Age, years ^a	62	(39–73)
Men, n (%) ^b	348	(48.5)
Hospital area, n (%)		
Surgery	411	(57)
Medicine	307	(43)

^a Values are mean (interquartile range)

^b The gender of one patient was not recorded

Table 3 Prevalence of pain in the 718 patients, by gender, age and hospital area

	Total patients, n	Patients with pain, n (%)	
Gender ^a			
Male	348	143	(41.1)
Female	369	175	(47.4)
Age class, years			
<39	172	84	(48.8)
39–61	175	64	(36.6)
62–72	189	94	(49.7)
>72	182	76	(41.8)
Hospital area			
Surgery	411	225	(54.7)
Medicine	307	93	(30.3)

^a The gender of one patient was not recorded

tive impairment. Response was high in assessing pain intensity: all patients completed the numerical scales given to them.

The overall prevalence of pain among interviewed patients was 44% (95% CI, 41%–48%); it was higher among women than men, as it was in the 62–72 years age group compared to other age groups and in the surgical wards as opposed to general medicine wards (Table 3). The wards with the lowest prevalence of pain were the Psychiatric Unit and Dermatology (both, 18% of patients), while the highest reported pain occurred in the General Surgery ward (80% of patients). For 3% (10 of 318) of patients in pain, a consultation with the Pain Therapy Unit had been requested.

The majority of patients (51.9%) suffered from pain for less than one week and it was of mild intensity (for 40.5%); for 37.7% of patients, pain was the consequence of surgery (Table 4).

Among the 318 patients in pain, 59% (95% CI, 54%–65%) were taking analgesics (Table 5). This percentage of treated patients remained substantially unchanged for different intensities of pain. However, it steadily increased from 29% to 73% passing from a pain duration of less than one day to a state of chronic pain. Among the patients treated with analgesics, 67% were taking them on a prn basis, 21% at fixed times and 13% (24/189) both at fixed times and on a prn basis; 82% were being treated only with non-steroidal anti-inflammatory drugs (NSAIDs), 8% only with opioids, and 4% with both.

The dosing regimen varied according to the type of analgesic (Table 6). Of those using NSAIDs, 72.2% were taking them on a prn basis while 16.0% were taking them according to a fixed schedule. Of those using opioids, 91% were taking them on a prn basis while 86.4% followed a fixed dosing schedule. NSAIDs were used above all (53%) by patients who had been in pain for less than 7 days, while opioids were being taken by those who had been in pain for longer.

A total of 30 patients reported that they were in no present pain (Table 7), even though they had indicated that they were in pain in the last 24 hours. Analysis of the relation between the intensities of pain perceived by patients and nurses was therefore conducted with 0 values considered as a class in itself. Cohen's k statistic equal to 0.17 (95% CI, 0.09–0.25) indicated a small correlation between patients'

Table 4 Distribution of pain in the among the 318 patients having pain in the past 24-h period, by intensity and cause

	Patients, n (%)	
Duration of pain		
<1 day	14	(4.4)
1–7 days	165	(51.9)
8–9 days	84	(26.4)
Chronic	44	(13.8)
Unknown	11	(3.5)
Intensity of pain		
Absent ^a	30	(9.4)
Slight	82	(25.9)
Mild	128	(40.5)
Strong	76	(24.1)
Unknown	2	(0.6)
Cause		
Surgery	119	(37.7)
Trauma	69	(21.8)
Diagnostic procedures	16	(5.1)
Cancer	28	(8.9)
Other	86	(26.6)
Unknown	2	(0.6)

^a These patients had no pain during the interview, although they had pain in the past 24-h period

Table 5 Analgesics use among the 189 patients with pain

	Patients, n (%)
Patients taking analgesics	189 (59)
Dosing regimen ^a	
Fixed schedule	39 (21)
As needed (prn)	126 (67)
Both	24 (13)
Type of analgesic ^a	
NSAIDs	155 (82)
Opioids	15 (8)
Both	7 (4)
Unknown	12 (6)

NSAIDs, non-steroidal anti-inflammatory drugs

^a Percent of 189 patients taking analgesics**Table 6** Dosing regimen for the 170 patients taking NSAIDs or opioids (including 7 patients taking both)

	Patients, n (%)
NSAID (n=162)	
Fixed schedule	26 (16.0)
As needed (prn)	117 (72.2)
Both	19 (11.8)
Opioids (n=22)	
Fixed schedule	19 (86.4)
As needed (prn)	2 (9.1)
Both	1 (4.5)

NSAIDs, non-steroidal anti-inflammatory drugs

Table 7 Agreement between patients' perceived pain and nurses' opinion. Values are numbers (%) of patients

Pain perceived by patients	Patients n (%)	Pain perceived by nurse			
		No pain	Slight	Mild	Intense
No pain	30 (9.5)	6	9	12	3
Slight	82 (25.9)	4	49	25	4
Mild	128 (40.5)	1	55	65	7
Intense	76 (24.1)	1	15	43	17
Total	316 (99.0) ^a	12 (3.8)	128 (40.5)	145 (45.9)	31 (9.8)

^a Data missing for two patients

perceived pain and the nurses' perception of the same. These statistics could, in fact, reach a maximum of 1 if the two assessments overlapped exactly, while values between 0 and 0.20 indicate little agreement. Our data reflect how nurses tend to underestimate patients' pain: only 25.9% of patients complained of slight pain as opposed to 40.5% indicated by nurses; 24.1% of patients spoke of intense pain compared to 9.8% indicated by nurses.

The average pain intensity, recorded by the patients on a scale of 0 to 10, was 4.9 (95% CI, 4.6–5.2). Pain intensity was higher among women than men (5.2 vs. 4.5, $p < 0.05$, Table 8). There was no significant difference, however, between age groups. Chronic pain was of the greatest intensity, but, here also, there was no significant difference between the groups considered. Cancer pain provided the highest intensity. There was no significant difference between general medicine wards and surgical wards and neither between people taking analgesics or not.

Discussion

Before outlining the main conclusions to be drawn from this survey into "the perception of pain", we must point out that

Table 8 Average pain intensity for 317 of the 318 patients with pain

Gender*	
Male	4.5
Female	5.2
Age class, years	
<39	5.3
39–61	4.4
62–72	4.8
>72	5.0
Duration	
<1 day	5.5
1–7 days	4.6
8–90 days	5.0
Chronic	6.0
Unknown	3.2
Cause ^a	
Surgery	4.5
Trauma	4.8
Diagnostic procedures	5.2
Cancer	5.8
Other	5.3
Use of analgesics	
Yes	4.8
No	4.9
Hospital area	
Medicine	4.6
Surgery	4.7

* $p < 0.05$ ^a n=315

the data show the limits which characterize transversal studies: it is impossible to know whether the information gathered is the cause or effect of what is observed. For example, pain intensity was similar between those taking analgesics and those who were not, but we cannot know if this apparent equality is due to the fact that patients receiving treatment have relieved their pain to the point of reaching those subjects not receiving treatment, or whether a noticeable number of patients in pain do not normally receive treatment. These data must therefore be interpreted with care.

Prevalence of pain in this study was 44%, a value which falls within the average of what little information is available in literature [2, 5, 7, 8, 23, 22, 24, 25]. Various studies have described the negative effects of pain on the patient. In particular, pain affects different aspects of quality of life, including functional status, psychological well being and relationships.

The fact that almost half of hospitalized patients were in pain may be considered "normal" from a viewpoint which sees the hospital as a place of unavoidable suffering. It appears unjustifiable, however, if one considers that with today's therapeutic techniques, over 90% of pain can be eliminated [26].

As pain is a subjective experience with physical, emotional, cultural and spiritual components, the use of multidimensional scales is indicated for a proper assessment. The use of a unidimensional scale (like the numerical rating scale) gives limited information on the nature of pain in a particular patient. Nevertheless, for the routine assessment of pain intensity and to study its prevalence in a population, a unidimensional instrument is preferable.

The survey shows a higher prevalence and a greater intensity of perceived pain (the latter is statistically significant) among women than men. This difference may reflect differences in the seriousness of the illnesses between men and women, or it may be due to cultural differences whereby it is not considered right in our society for men to express their pain.

The most frequent type of pain is post-surgical and in most cases it does not last longer than one week.

As regards analgesics, 59% of patients in pain were using them; most were taking NSAIDs as needed. These data are rather disappointing as they indicate a certain negligence towards patients (40% were not treated) and an inappropriate

use of analgesics (their use "as needed" is not advised by experts unless it is to deal with sporadic pain) [26].

It is not possible to interpret the data regarding pain intensity connected with the use of analgesics as the base level of pain intensity is not known.

There was little agreement between the patients' perceived pain and nurses' interpretation of their pain (Cohen's $k = 0.17$; 95% CI, 0.09–0.25). These findings show a tendency for caregivers to underestimate the patient's pain. This is a well-known aspect of the problem of "putting yourself in the other's shoes" and lends support to the belief that only the patient is able to judge his or her own pain. This difference between caregivers' and patients' assessment of pain intensity is in line with the findings of Grossman et al. [9]. In their study, the values of pain on visual analog scales (VAS) reported by cancer patients and caregivers differed substantially (higher among the former), especially among those patients with higher levels of pain. In a study of 50 patients with acute pain, Drayer et al. [27] reported a low correlation ($r=0.21$) between caregivers and patients regarding the presence of pain, due to the fact, as doctors and nurses themselves maintained, that patients exaggerated about their pain. We believe that the discrepancy between patients' and caregivers' assessment of pain is mainly related to the poor consideration that pain is given. Nevertheless, this point needs further study.

In a random study of 358 patients in a general hospital, Donovan et al. [2] reported a pain prevalence of 58% and the continued absence of adequate pain relief, justified by the fear that opioid use will lead to addiction. Findings such as this underline how little attention is given to suffering, placing it among the most common causes of undertreatment [28]. We therefore believe that a fundamental step should be to measure patients pain daily at the bedside, as is done with other physiological factors (e.g. blood pressure, pulse rate, body temperature) using an appropriate graph. We believe the present data accurately reflect the actual situation in our hospital. They, in fact, concern 93% of interviewable patients on an ordinary day. Besides providing information on "the problem of pain" in a general hospital, these findings may constitute the basis for special initiatives in the various wards, aimed at improving the quality of healthcare provided.

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