Impact of acute pain and analgesic adequacy in hospitalized patients

Impacto da dor aguda e adequação analgésica em pacientes hospitalizados

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ABSTRACT

BACKGROUND AND OBJECTIVES: Pain is a frequent symptom in the hospital environment. The study aimed to identify the impact of acute pain on activities of daily living and to analyze analgesic adequacy.

METHODS: Cross-sectional study carried out in six units of a University Hospital. Patients were assessed for the presence and intensity of pain and impact on activities of daily living. Analgesic adequacy was assessed by the Pain Management Index. The association between pain and sociodemographic and clinical characteristics was investigated using the Chi-square test. A logistic regression model was applied to assess the impact of pain intensity on activities.

RESULTS: 134 patients, mean age 53 years, were evaluated. At the moment of the interview 37 (27.6%) participants reported pain and 58 (45.7%) reported pain in the 24 hours before the interview. The average pain intensity was 6.6±2.4 and the pain was more frequent in patients in the Emergency Department, Intensive Care Unit and Internal Medicine. There was an association between pain and the female sex and there was no association with hospitalization unit, diagnosis, and specialty. Pain affected the ability to eat (p=0.036) and sleep (p=0.008). Most prescriptions (68%) were unsuitable for pain intensity.

CONCLUSION: Frequency of pain was high, was more prevalent in women, and significantly impaired the ability to eat and sleep. Inadequacy of the analgesic regimen regarding intensity of pain was found in more than half of the patients, indicating that it's necessary to improve pain control in the hospital environment.

Keywords: Acute pain, Analgesia, Pain, Nursing.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor é um sintoma frequente no ambiente hospitalar. O estudo objetivou identificar o impacto da dor aguda sobre as atividades de vida diária e analisar a adequação analgésica.

MÉTODOS: Estudo transversal desenvolvido em seis unidades de um Hospital Universitário. Os pacientes foram avaliados quanto à presença e intensidade da dor e prejuízos às atividades de vida diária. A adequação analgésica foi avaliada pelo Índice de Manejo da Dor. A associação entre a dor e as características sociodemográficas e clínicas foi investigada por meio do teste Qui-quadrado. Um modelo de regressão logística foi aplicado para avaliar o impacto da intensidade da dor nas atividades.

RESULTADOS: Foram avaliados 134 pacientes, com média de idade de 53 anos. No momento da entrevista 37 (27,6%) participantes referiram dor e 58 (45,7%) relataram dor nas 24h que antecederam a entrevista. A intensidade média da dor foi 6,6±2,4 e a dor foi mais frequente em pacientes do Pronto Atendimento, Unidade de Terapia Intensiva e Clínica Médica. Houve associação entre dor e sexo feminino e não foi encontrada associação com unidade de internação, diagnóstico e especialidade. A dor afetou a capacidade de comer (p=0,036) e dormir (p=0,008). A maior parte das prescrições (68%) estava inadequada à intensidade da dor.

CONCLUSÃO: A frequência de dor foi alta e a incidência maior no sexo feminino, afetando de modo significativo a capacidade de comer e dormir. A prescrição de fármacos era inadequada à intensidade da dor em mais da metade dos pacientes, indicando a necessidade de aprimorar os protocolos de controle da dor.

Descritores: Analgesia, Dor, Dor aguda, Enfermagem.

INTRODUCTION

Acute pain has an important alerting role and chronic pain is a global public health problem[1]. In the hospital environment pain can result from the disease itself, from diagnostic processes or therapeutic interventions and can be source of stress for patients, potentially prolonging hospitalization or inducing other morbidities, increasing the costs of treatment[2].

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Acute pain contributes to its chronification, provokes physical and psychological implications, resulting in suffering, discontent with attendance, a larger time of recovery and more risk of complications[3-6]. The adequate control of pain is an indicator of quality of assistance and is a fundamental human right. However, despite the efforts, handling pain is still a challenge in the hospital context[2,3,7,8].

Understanding the impact of acute pain and the analgesic adequacy in hospitalized patients can contribute to a better assistance, thus, this study's objective was to identify the impact of acute pain on daily life activities of hospitalized patients and analyze the analgesic adequacy.

METHODS

Cross-sectional study, performed at the Internal Medicine, Surgical Clinic, Post-Anesthesia Recovery (PAR), Adult Emergency Department, as well as the Intensive Care Unit (ICU) and Day Hospital of the University Hospital of the city of São Paulo with 110 beds. The study included all adult hospitalized patients which met the following inclusion criteria: 18 years old or more, preserved ability of verbalizing and comprehension, having been hospitalized in the two days established for the collection of data. The hospitalized patients in the ICUs and PARs should have also had a Richmond Sedation and Agitation Scale (RASS) score between +1 and -2 in order to be included.

The collection of data was done by a trained team using a sociodemographic, clinical and treatment data instrument. Intensity of pain was assessed by the visual numeric scale (VNS)[9]. The ai nonf ai non daily life activities like walking, sitting, eating, sleeping, brushing the teeth, defecating, moving in bed, combing hair and breathing deeply/coughing was assessed answering ''yes" or ''no" to the question: did the pain you feel in the last 24 hours made any of these activities more difficult?

The analgesic adequacy was assessed by the Pain Management Index (PMI)[10], which compares the potency of the prescribed analgesic to the pain intensity, using the formula PMI = analgesic potency (AP) – pain intensity (PI).

The PA was classified as: zero = no prescribed analgesic; 1 = non-hormonal anti-inflammatory analgesic (NSAID). 2 = weak opioid (e.g. tramadol, codeine); 3 = strong opioid (e.g. morphine, meperidine). Pain intensity was classified as: zero = no pain; 1 = mild pain (1-3); 2 = moderate pain (4-6); 3 = severe pain (7-10). In the PMI the resulting scores range from -3 to +3, with negative values indicating analgesic inadequacy and zero or positive scores representing its adequacy. The study was approved by the Ethics and Research Committee of the Nursing School and the University Hospital of USP (Opinion number: 1.596.360). The participants who agreed to participate signed the Free and Informed Consent Term (FICT) and were included in the study.

Statistical analysis

The data was inserted in an electronic spreadsheet and analyzed in a statistical software. After verifying normality, the Chi-square test was used in order to evaluate the association of pain with the sociodemographic and clinical variables. A linear model of regression was applied in order to evaluate the impact of the pain intensity in the activities of daily life. For all analysis the value of $p<0.05$ was considered significant.

RESULTS

Considering the maximum occupation of adult beds of the University Hospital in two days of data collection it would be possible to reach a population of 220 patients. Patients who refused to participate (9.8%), who did not meet the inclusion criteria (14.2%), who were outside the unit of origin at the time of data collection (7.0%) and those who participated in the study on the first day of data collection and remained hospitalized (8.1%) were excluded from the study. 134 patients who met the inclusion criteria were included, representing 60.9% of the maximum occupancy of the beds on the two days of collection.

Mean age was 53±19.4 years, the majority was males (56.7%), admitted to the Surgical Clinic (31.3%), Internal Medicine (30.6%), Emergency Department (15.7%), PAR (9.7%), ICU (8.2%) and Gynecology (4.5%). Regarding the specialty, 53.4% of the patients were in the care of the Internal Medicine, 25.9% in General Surgery, 15.3% in Orthopedics and 5.4% in Gynecology. Prevalence of pain at the time of the interview was 27.6% and in the last 24 hours it was 45.7%. The prevalence was higher among women (60.0%), in patients in the Emergency Department (68.8%), in the ICU (54.5%) and the Internal Medicine (46.3%).

Mean intensity of pain was 6.6±2.4. Light pain was observed in 10.1% of patients, moderate pain in 34.8% and intense pain in 55.1%. Most frequent pain was in the abdominal area (33.3%), inferior limbs (17.5%) and head (12.7%), and was intermittent in 57.4% and continuous in 42.6% of patients.

There was an association of pain with women (p=0.005), but there was no association with the hospitalization unit (p=0.177), diagnosis (p=0.220) and medical specialty (p=0.708). Activities most affected by pain were movement in bed (61.2%), sleep (56.7%), walking (52.2%), sitting (37.3%) and eating (32.8%). The linear regression analysis assessed the impact of pain intensity on each of the activities of daily living and showed significant impact of pain intensity on the ability to eat and sleep. Other analyzed activities were not significantly affected by the presence of pain (Table 1).

The analysis of analgesic adequacy indicated that most of prescriptions were inadequate to the intensity of pain, with analgesic

Table 1. Analysis of the impact of pain on activities

Impact of pain on activities	Odds Ratio	Confidence interval		p-value*
Walking	1.22	0.99	1.52	0.061
Eating	1.28	1.03	1.65	0.036
Sleeping	1.35	1.09	1.72	0.008
Brushing the teeth	0.97	0.74	1.27	0.805
Defecating	1.02	0.80	1.30	0.899
Moving in bed	1.16	0.95	1.45	0.156
Combing hair	1.31	0.96	1.90	0.112
Breathing deeply	1.12	0.90	1.41	0.336
Sitting	1.15	0.93	1.44	0.197

*Linear regression

potency inferior to expected. The analgesic schemes used in the hospital varied greatly and the most frequent were: associating dipyrone or paracetamol with a weak opioid (39.0%), analgesics in monotherapy (28.8%) and analgesic associated or not to NSAIDs and weak opioids (13.6%) (Table 2).

Table 2. Description of analgesic schemes and analgesic adequacy according to Pain Management Index

	n	%
Adequate analgesia	19	32,2%
Inadequate analgesia	40	67,8%
Undertreatment	29	72,5%
Overtreatment	11	27,5%
Analgesic schemes		
Analgesic + weak opioid	23	39,0%
Analgesic	17	28,8%
Analgesic + non-hormonal anti-inflammatory analgesic (NSAID) + weak opioid	04	6,8%
2 Analgesics + weak opioid	04	6,8%
Analgesic + non-hormonal anti-inflammatory analgesic (NSAID)	02	3,4%
Other schemes	09	15,2%

*Analgesic + NSAID + weak opioid + strong opioid; analgesic + NSAID + strong opioid; strong opioid (monotherapy); 2 analgesics + weak opioid + strong opioid; analgesic + weak opioid; analgesic + strong opioid; analgesic + 2 weak opioids; 3 analgesics; 2 analgesics + strong opioid.

DISCUSSION

The data shows that 45.7% of evaluated patients presented pain in the last 24 hours, similar to other studies that assessed the impact of acute pain in hospitalized patients[8,11-13]. A study that assessed acute pain in hospitalized patients and reviewed 14 studies totaling 23.523 patients showed that 37.7 to 84.0% presented pain in the last 24 hours and of these 9.0 to 36.0% reported intense pain[14]. However, in the present study the frequency of intense pain was even higher (55.1%).

Acute pain is reason of great discomfort, agitation and stress for the patient, family, and health team. The patient with pain has disadvantages in the physical functionality and quality of life, a slower recovery and more risks of complications[5,6,15].

The intensity and duration of acute pain increase the risk of pain chronification[15,16]. Currently, the control of acute pain is possible due to the great availability of analgesics of varying potency and classes, which can be associated with non-pharmacological methods in order to potentiate analgesia[17,18]. Therefore, there is no scientific or ethical justification for pain not to be adequately treated and professionals and institutions should be aware and concerned with adequate pain control, whether it be acute or chronic.

Data analysis showed an association between pain and women, which was also highlighted in other studies that investigated pain in hospitalized patients[8]. Understanding the diversity of pain and responses to treatment in subgroups of women, children, elderly individuals and ethnic minorities were factors pointed out as research priorities for pain prevention and its impact[19].

The high incidence of pain in women is known and seems to be related to the female biology, cognition, social factors as low income, lower access to the health system and less respect to the complaints of pain, resulting in insufficient prescriptions or dosage readjustments[20,21]. Studies indicate that there are specificities on the neural representation of pain in the cerebral cortex, differences in the functioning of the immunological system, besides hormonal factors that explain the more frequent pain and less tolerance to pain in the female sex[21-23]. Regarding cognitive aspects, women demonstrate more tendency to catastrophic thoughts and rumination. As for the pain modulation system, it's possible to observe less efficiency of the endogenous pain inhibition system in women[21,22].

No association between pain and the unit of hospitalization or type of diagnosis was found in the present study, a result which is similar to a multicentric study done in Italy, investigating pain in hospitalized adults[8].

This study's main objective was to analyze the impact of acute pain on the patients' daily life activities. The findings show that, although the patients reported more frequency of the pain impact on general activities like ability to move in bed, sleep and walk, only the eating and sleeping abilities presented association with the intensity of pain, indicating that those were the activities most affected by pain. Similar results were found in a research performed in Iceland, which showed that moderate and intense pain interfered on general activities and sleep[24].

Disease and pain can greatly undermine the organism and sleep is essential for the restoring of psychic and physical functions[25]. In the hospital environment, sleep is affected by noise, luminosity, interruptions, loss of privacy and unfamiliarity to the bed, among other factors[26]. Pain activates the ascending reticular system and awakens the patient or causes non restorative sleep[27].

The relation between pain and impaired sleep and their negative impact on mood, tolerance, attention and treatment cooperation, among other things, is widely described in the literature[27-29]. It's maybe not possible to interfere in the hospital environment factors that disrupt sleep, but it's possible to control pain in order to improve sleep and, therefore, help the reestablishment of the patient.

A research that evaluated the interference of pain in the activities of oncology patients in an outpatient clinic context concluded that the impact of pain in the activities increased in proportion to the intensity of pain, similar to the present study[30]. Sleep and general activities[30] were the most affected by intense pain. A multicentric research, which also assessed patients with cancer, explored the interference of intensity of pain in the daily life activities and observed a higher impact of pain in the general, work and walking activities[31].

The other evaluated aspect, analgesic adequacy, evidenced that most of the prescriptions were inadequate to the pain intensity (68%). Similar data was observed in a Brazilian study that found analgesic inadequacy in 72% of prescriptions[32]. A study conducted in Ethiopia, which evaluated analgesic adequacy in an oncology ward, also showed that 65% of prescriptions had analgesic power lower than expected[13].

Undertreatment of pain, related to the use of analgesics with insufficient potency in relation to pain intensity has been described by several authors[33,34]. The reasons for such disagreement may be several: inadequate assessment of pain, inadequate assessment of

the relief obtained from the treatment and poor communication between professionals, resulting in a non-readjustment of prescription; fear or lack of knowledge about the correct prescription of opioids and little appreciation by professionals of the suffering and damage resulting from pain, resulting in treatment negligence. It should be noted that the PMI is a conservative index, because it takes into account only the potency of the analgesic and not the dose or association of analgesics, which have a cumulative effect.

In this study, the more frequent schemes were analgesics associated with weak opioids and analgesics in monotherapy. Analgesia schemes including only analgesics were also observed in other studies done in university hospitals, in which 42.7 to 87.8% of prescriptions did not include opioids[32,35].

Despite the predominance of analgesics associated with weak opioids, this study observed a great variety of analgesic schemes, not always following the recommendations of the World Health Organization analgesic ladder[36].

Multimodal analgesia is recommended for the handling of pain because it acts on several mechanisms of pain modulation and can reduce adverse effects, contributing to the control of pain and the patients recovery[37]. The flaws identified in analgesic therapy suggest the necessity of training of the medical and nursing teams and the development of standardized analgesic protocols, which allow readjustments for quick and effective rescue.

One of this study's limitations if the fact that the collection of data was done solely in one hospital and only in two days, in different weeks, which may have influenced the type of procedure performed and the characteristics of the hospitalized patients. Another limitation is the cross-sectional design, which does not allow establishing causal relations between the variables.

CONCLUSION

The frequency and incidence of pain was higher in women, significantly affecting the ability to eat and sleep. The prescription of drugs was inadequate to the intensity of pain in more than half of the patients, indicating the necessity to improve pain control protocols.

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