

Pain in children and adolescents hospitalized in a center of reference

Dolor en niños y adolescentes hospitalizados en un centro de referencia

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Abstract

Introduction: The evaluation and treatment of pain in hospitalized is still an important health problem. **Objective:** To know the prevalence, characteristics and approaches to pain management in children and adolescents hospitalized in the Pediatric Hospital of the Pereira Rossell Center (HP-CHPR), a pediatric reference center in Uruguay. **Patients and Method:** Cross-sectional study, through survey and review of clinical records on 09/13/16. All hospitalized children under the age of 19 were included. Variables: age, gender, reason for admission, presence of cognitive disorder, the prevalence of pain at some time during hospitalization, in the last 24 hours and during the interview, cause of maximum pain, intensity, pharmacological and non-pharmacological treatment. **Results:** 97.4% (152/156) hospitalized children were included. Pain prevalence at some point during hospitalization: 51.3% (78/152, 95% CI: 43.2-59.3); in the previous 24 hours: 39.5% (60/152, 95% CI: 31.7-47.2); during the interview: 15.8% (24/152, 95% CI: 10-21.5). Intensity: mild 13/24, moderate-severe 11/24. Maximum pain referred during hospitalization: needle punctures 48.5% (38/78). They had some analgesic prescription 47.3% of them had some analgesic prescription. Inadequate interdose interval: 45.8%; adequate dose 98.9%; intravenous administration: 43.7%; contraindication to oral route: 40.5%. **Conclusions:** Regarding children and adolescents hospitalized, 39.5% reported pain 24 hours before being the interviewed and 15.8% reported pain during the interview. The maximum pain reported during hospitalization was due to needle punctures. Children in pain with inappropriate analgesic prescriptions are still detected.

Keywords:

Pain management,
analgesia,
hospitalized child

Introduction

According to the International Association for the Study of Pain, this is an *“unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”*¹. It is challenging to identify and evaluate it in children due to the characteristics of their neuropsychological development and their inability to express it verbally in the first years of life. However, this does not deny the possibility that they may be in pain and need an appropriate approach². It is necessary for the healthcare team to recognize that different diseases, health conditions, treatments or diagnostic procedures can trigger pain, in order to detect it and treat it promptly. In addition, these situations cause anxiety, fear and even apprehension towards healthcare workers and, for their correct management, all their components must be considered, including emotional, social and spiritual aspects³.

The importance of a correct assessment and treatment of pain is because this is one of the most frequent symptoms of consultation in pediatrics⁴. Additionally, all children and adolescents have the right to receive adequate treatment and the healthcare team has the duty to be trained and to ensure quality care, avoiding unnecessary pain. *“Pain management is a clinical act that requires the establishment of good clinical practices, and the lack of training can no longer be an excuse”*⁵.

International publications note that despite efforts to improve care quality, the assessment and treatment of pain in hospitalized children is still a health problem⁶⁻⁹. There are studies in Uruguay that have identified the same problem^{10,11}. In the Pediatric Hospital of Pereira Rossell Hospital Center (HP-CHPR), a national reference center of the public health subsector, a 34% of pain prevalence in hospitalized children was reported in 2011¹⁰. In 2014, another national study, which included the same health center and other public and private institutions, found a similar prevalence¹¹.

The objective is to know the prevalence, characteristics, and practices of pain management in children and adolescents hospitalized in HP-CHPR intermediate care units for one day.

Patients and Methods

A cross-sectional mixed method study was conducted through a survey and review of clinical records on September 13, 2016. A single day was randomly selected to have a snapshot of the pain prevalence in hospitalized children and to avoid the bias of advanced audit knowledge that could change usual practices of the clinicians.

All children under the age of 19 hospitalized in intermediate care units were included: medical, surgical, orthopedics, burn child unit and reconstructive surgery (UNIQUE) sectors, and the hemato-oncology sector of HP-CHPR. Patients who were unable to conduct the interview after three visits were excluded, as well as those who did not obtain informed consent from the caregivers or the child consent.

Information source

A survey and review of clinical records were conducted.

It was considered a patient in pain when the child, adolescent or his or her caregiver reports feel or felt pain at the time of the interview, in the 24 hours before the interview or at some point during hospitalization. It was assessed the cause of maximum pain experienced during hospitalization (needle punctures, procedures, postoperative period, treatments, others). In those patients who reported pain during the interview, the pain intensity was assessed using scales recommended by the World Health Organization (WHO), according to age and clinical condition of the child, applied by previously trained team members. In newborns, the scale NIPS (Neonatal Infants Pain Scale) was used¹². For children between one month and three years of age, the FLACC scale (Face, Legs, Activity, Cry, Consolability) was used¹³. For children between three and eight years old, faces pain scale revised was used¹⁴. For those children over eight years of age, it was used the self-assessment visual analog scale for pain¹⁵. For children over three years of age, whose clinical record registered cognitive disorder and were unable to respond to the faces pain scale, the r-FLACC scale (revised-FLACC) was used¹⁶. From the clinical record analysis, it was recorded: age (years, months), gender, weight (kg), presence of cognitive disorder, hospitalization sector (medicine, surgery, orthopedics, burn unit, hemato-oncology) and the reason for admission. The reason for admission was classified into: acute infectious disease, non-infectious disease, surgery or postoperative, social reasons, procedures or studies, trauma, burns. Pain management strategies (pharmacological and non-pharmacological) were recorded according to medical indications made in the last 24 hours. The pharmacological treatment was analyzed as dose, route of administration, contraindications to oral route, interdose interval, and adjuvant drugs. Drugs, doses, and interdose intervals used were compared with WHO recommended guidelines, as well as with those suggested by standard guidelines for the treatment of acute and persistent pain in pediatrics^{2,17-19}. A data collection sheet designed for the study was used which was tested in a pilot test.

Data analysis

The qualitative variables were expressed in absolute and relative percent frequencies, and the quantitative ones, in measures of central tendency and their range. To compare proportions, the Chi-square test was used, considering significant $p < 0.05$. The statistical analysis was performed using IBM SPSS 20.0 statistical software for Windows.

Ethical considerations

This study was authorized by HP-CHPR management and approved by the Medical School Research Ethics Committee of the University of the Republic. Informed consent was requested from caregivers (mother, father or guardian) and the consent of children and adolescents. In order to ensure the care continuity, if the child or his or her caregiver referred pain during the interview, it was reported to the on-call healthcare team immediately.

Results

On the day of the study, 156 children and adolescents were hospitalized, 152/156 (97.4%) of them were surveyed, two of them declined to participate and two were not in their rooms after three visits. The interview could be answered by the children and adolescents themselves in 24/152 (16%), in the rest of the interviews, the respondent was: the mother 100/152 (66%), the father 14/152 (9%), and another caregiver 14/152 (9%). Table 1 shows the characteristics of the children and adolescents included.

Pain prevalence reported at some point during hospitalization was 51.3% (78/152; CI 95%: 43.4%-59.3%) and in the 24 hours before the interview, it was 39.5% (60/152; CI 95%: 31.7%-47.2%). The pain prevalence at the time of the interview was 15.8% (24/152; CI 95%: 10%-21.6%), 11/24 of them reported moderate-severe pain.

Table 2 shows the pain prevalence in the included children according to their reason for hospitalization. There was no statistically significant difference between the presence of pain in patients admitted for surgical or potentially surgical reasons (surgery or postoperative period, trauma, burns, procedures or studies) and those admitted for other reasons (acute infectious and non-infectious disease and social reasons) ($p=0.25$).

Out of the patients who reported pain at some point during hospitalization, 38/78 (48.5%) of them reported needle punctures such as intravenous accesses and blood draw puncture as the cause of maximum pain, followed by other medical procedures (table 3).

Out of the children who reported pain at the time of the interview, 14/24 had some analgesics prescrip-

tion. The most indicated analgesic was dipyrone or metamizole. Table 4 shows the analgesics prescribed in these children and adolescents according to the intensity of pain reported.

With regard to analgesic prescriptions, suitable dosage indications were found in all of them, and inadequate interdose interval in four out of 16 children, where the interval was "on demand" or "without schedules". The route of administration was intravenous in eight out of 16 patients. Four out of eight patients presented some contraindication to oral route (three due to vomiting and one due to immediate postoperative period).

Prescription of adjuvant drugs was found in one case (gabapentin). No record of indication of non-pharmacological measures was found in any case.

Discussion

This study, which used similar operational definitions and methodology to previous studies, found that in children hospitalized in the HP-CHPR the pain prevalence in the last 24 hours and at the time of the interview did not vary from those reported previously. This represents a problem and a major challenge for both professionals who work directly with patients and the management team⁹⁻¹¹. Despite the methodological heterogeneity of international research in this area, it is repeatedly pointed out that pain in hospitalized children and adolescents is a complex health problem and that its approach is still a worldwide challenge^{6-9,10,11}.

The literature reports that the most frequent causes of pain during hospitalization are surgical or potentially surgical causes (surgery, postoperative period, trauma, burns, procedures or studies)^{6,8,9}. However, no statistically significant differences between surgical and non-surgical causes of hospitalization were observed in this series. This may be related to multiple factors that could have acted as biases such as the period of the year in which the survey was conducted where hospitalizations due to acute infectious disease (acute lower respiratory infections) predominated and the low number of children hospitalized for other reasons. It would be interesting to replicate this study at another time of the year and include more children hospitalized for surgical or other reasons.

When the children and their caregivers were asked about the cause of maximum pain during hospitalization, both referred to medical punctures or procedures as the most frequent cause. Friedrichsdorf et al had already documented this in a study conducted in the United States, where 40% of the hospitalized children referred needle punctures and blood draws as the maximum or worst pain experienced during hospi-

Table 1. Characteristics of children and adolescents included, hospitalized in a referral center in Uruguay. (n = 152)

Variable	Absolute frequency	Relative frequency (%)
Age (years, months)	Medium 2 years Range 15 days- 17 years	
Sex		
Male	85	56
Female	67	44
Cognitive disorder	8	5.3
Hospitalization place		
Medicine room	109	71.7
Surgery room	19	12.5
Hemato-oncology.	11	7.2
Orthopedics	8	5.3
Burning center (UNIKUER)	5	3.3
Reason for hospitalization		
Infectious acute pathology	61	40.1
Acute non-infectious pathology	32	21.1
Surgery or postoperative	23	15.1
Social reasons	14	9.2
Procedures or studies	9	5.9
Trauma	8	5.3
Burns	5	3.3

talization^{7,20}. It is necessary to establish action protocols in order to avoid this cause of unnecessary pain, including the systematic use of local anesthetics and other non-pharmacological measures such as positioning the child seated, maternal breast or oral sucralose in children under one year and distraction strategies according to age in all cases. Sometimes it is recommended sedation and analgesia before punctures or procedures²⁰.

Regarding the treatment of pain in the included children, it was detected the non-use of non-pharmacological strategies. However, the literature highlights the importance of a multimodal approach to pain. This involves the individualized combination of pharmacological strategies (non-opioid analgesics, opioids and adjuvant drugs) and non-pharmacological (psychotherapy, guided breathing, aromatherapy, biofeedback, mindfulness, yoga, self-hypnosis, among others), and emphasizes its usefulness mainly by decreasing anxiety and fear, as well as being widely accepted by children and their families^{2,7,20,21}.

Like previous national studies, children in pain during the interview were observed in this series, without

Table 2. Prevalence of pain regarding hospitalization reasons in children and adolescents admitted to a referral center in Uruguay. (n = 78)

Reason for hospitalization	Absolute frequency	Relative frequency (%)
Infectious acute pathology	29	37.2
Acute non-infectious pathology	18	23.1
Surgery or postoperative	12	15.1
Social reasons	6	7.7
Procedures or studies	6	7.7
Trauma	4	5.1
Burns	3	3.8

Table 3. Causes of maximum pain reported during the stay in children and adolescents hospitalized in a national reference center in Uruguay. (n = 78)

Cause of maximum referred pain	Absolute frequency	Relative frequency (%)
Needle punches	38	48,5
Medical procedures	14	18
Surgery / post operative	6	7,7
Trauma	3	3,8
Acute disease or infection	2	2,6
No answer	15	19,2

Table 4. Analgesics prescribed to children and adolescents hospitalized in a referral center in Uruguay with pain during the interview, according to the intensity of pain reported. (n = 24)

Pain intensity	Frequency of analgesics prescription Absolute frequency	Medication prescribed Absolute frequency
Mild	6	Dipyrone/metamizole 3 Ibuprofen 1 Ketoprofen 1 Tramadol + dipyrone 1
Moderate / severe	8	Dipyrone/metamizole 3 Ibuprofen 2 Morphine 1 Ketoprofen + dipyrone 1 Ketoprofen + tramadol 1

any prescription for analgesics or with inadequate prescriptions. In addition, the route of administration of analgesics chosen still represents an aspect to be considered. In this series, half of the children who received intravenous analgesics have not contraindication to oral route. The WHO proposes, as one of its principles for an adequate analgesic prescription in children, the use of the oral route whenever possible. There are many reasons for this recommendation; in particular, the fact that children prefer it, the “fear” component of the oral route decreases, prevents venous access and potential complications, etc. To this date, the myth that the intravenous route is more effective than the oral one is still common among health professionals^{22,23}. The intravenous route is safer in cases of digestive intolerance or diarrhea and achieves its therapeutic effect before the oral route, making it useful for the first dose in case of acute pain. However, in light of the results of this study, there is a need for wider dissemination and education about the WHO principles in order to prioritize, wherever possible, the use of the oral route for pharmacological treatment of pain in children, following these recommendations².

Although the dose of the prescribed analgesics did not represent a problem in this series, indications of “on demand” analgesia were observed. In this regard, the WHO has also established as one of its principles the prescription of analgesic drugs “by the clock” and not “on demand”, “if suffer” or “if required”². This phenomenon, which has already been reported in previous international and national publications, may have an adverse impact on the pain management of the child since it is necessary that the child or his or her caregivers recognize and express pain in order to trigger the mechanisms aimed at its control⁶⁻¹⁰. This, along with other reasons such as difficulty in determining the pain intensity, the lack of experience in the use of certain analgesics, not using non-pharmacological strategies, etc. could be at the base of what was found: patients who, despite having a prescription for analgesic, persisted with pain. This could also be related to the lack of a re-evaluation of the analgesic plan after the initial indication, with no possibility of necessary adjustment in the prescribed plan²⁴. The objective of this study was not to assess these causes, although they would be of interest for further research.

With regard to prescribed analgesic drugs, it is worth noting that dipyrone or metamizole was the most indicated, as reported in other national studies^{9,10}. This fact is particularly different from that reported in other parts of the world, where the prescription of acetaminophen and ibuprofen predominate among non-opioid analgesics following the WHO recommendations⁶⁻¹⁰. Low morphine use was also observed in children with moderate-severe pain. National studies that

explored the knowledge of resident physicians^{22,23} and nurses¹ about opioids revealed significant deficiencies, and the existence of myths about morphine similar to those of the non-professional population that may be the basis of these findings which included: fear of respiratory depression, reserve it for terminally ill patients, fear of addiction, etc.^{22,23}. Morphine is still the drug of choice according to WHO for the treatment of acute or persistent severe pain in children with medical conditions in both oncological and non-oncological patients, with extensive scientific evidence supporting its prescription and monitoring^{2,25-27}.

In light of the repeated studies showing deficits in the detection and management of pain in the hospital center studied, it is essential to achieve consensus for a better care of children and adolescents in pain^{9,10}. This implies the awareness and basic and continuous training of all professionals involved in the subject. Addressing this important health problem is a management challenge and requires a long-term institutional policy with the participation of all those involved: physicians, nurses, health managers, patients and their families²¹. The application of ISO 9001 Standards can be an effective method for integrating the different components of a well-organized multidisciplinary program, including a quality manual, maps or flowcharts of care processes, procedures, quality indicators, and systematic records of all steps and processes²⁸. Appropriate approach and monitoring of pain in children should be part of the skills and abilities of physicians and nurses and should be a goal of care for all health-care institutions. This change in the care quality must necessarily include basic education and continuous updating of all health professionals involved. The control of pain is a human right that must be guaranteed²⁹.

Conclusions

- Out of the children and adolescents hospitalized in a national hospital of reference, 39.5% of them reported pain in the previous 24 hours and 15.8% during the survey.
- The maximum pain reported during hospitalization was due to needle punctures.
- In the care center studied, children hospitalized in pain and without analgesic prescriptions or with errors according to WHO recommendations are still detected.

1 Ruíz V, Klisich V, Notejane M, Bernadà M. Knowledge related to pain management in children. Survey to postgraduate students and residents of a center of reference in Uruguay, 2016. Unpublished paper.

Ethical Responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors have obtained the informed consent of the patients

and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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