

## Assessment of Pain in Children Hospitalized in the Emergency Department, Vietnam National Children's Hospital

Vi Quang Do<sup>1</sup>, Toan Ngoc Pham<sup>1\*</sup>, Hong Thi Dinh<sup>1</sup>, Xuan Thi Do<sup>1</sup>, Hai Thanh Le<sup>1</sup>, Oanh Thi Nguyen<sup>1</sup>, Duy Ngoc Le<sup>1</sup>, Vera Komisarjevsky<sup>2</sup> and John Colin Partridge<sup>3</sup>

<sup>1</sup>Department of Emergency and Poison Control, Vietnam National Children's Hospital, Hanoi, Vietnam

<sup>2</sup>Department of Emergency and Poison Control, University of Maine, Orono, Maine, USA

<sup>3</sup>Department of Emergency and Poison Control, University of California, San Francisco, California, USA

\*Corresponding author: Toan Ngoc Pham, Department of Emergency and Poison Control, Vietnam National Children's Hospital, 18/879 La Thanh, Dong Da District, Hanoi, Vietnam, Tel: 84-93-340-0262; E-mail: [ngoctoancard@yahoo.com](mailto:ngoctoancard@yahoo.com)

Received date: Jul 05, 2017; Accepted date: Aug 09, 2017; Published date: Aug 11, 2017

Copyright: © 2017 Do VQ, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Background:** Assessment of pain in emergency settings can be difficult, particularly in young children. However, it is essential to the appropriate management and treatment in children.

**Objective:** To assess pain levels in pediatric patients admitted to an emergency department using standardized pain assessment tools.

**Methods:** Descriptive, cross-sectional study of 1840 children hospitalized in the Emergency and Poison Control Department of the Vietnam National Children's Hospital in Hanoi, Vietnam from 12/2014 to 3/2015. On admission and again at 6 hours, nurses or physicians assessed pain levels using the Wong-Baker Faces scale for children < 3 years and the FLACC score for children >3 years of age. Time of first analgesic administration (paracetamol or opioids) and basic demographic data were prospectively recorded on standard datasheets.

**Results:** We enrolled 1840 children (66% male, 34% female) during the 4 months study period. Of this total, 1221 (66.7%) were 1 months to 3 years in age. On admission, no pain was noted in 356 (19.3%), mild pain in 746 (40.5%), moderate pain in 681 (37%), and severe pain in 42 (2.3%). On admission, the mean pain score was  $(2.92 \pm 1.94)$  on admission. After 6 hours, 820 (44.6%) children were pain-free and 755 (41%) had mild pain, with mean pain scores of  $1.59 \pm 1.79$ . Analgesics were not administered to children with no pain; analgesics were administered to 3.8% and 26% of patients with moderate or severe pain, respectively. There was no difference in the pain level by age groups or gender. Only 2.3% patients received analgesics, all of these had moderate or severe pain scores.

**Conclusions:** Pain scales are useful in stratifying pain in children so that analgesics can be appropriately administered to those with the most acute pain. Pain scores can guide emergency physicians to treat nonverbal patients most in need of analgesics.

**Keywords:** Children; Pain recognition; Pain management; Pain assessment

### Introduction

According to the International Association for the Study of Pain – IASP - 1994, “pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” [1].

Pain is a critical symptom in many illnesses. “Pain- 5th Vital Sign” was a call to routinely assess pain in just as the other four vital signs such as temperature, heart rate, respiratory rate, and blood pressure are assessed [2]. In response, assessment of pain has become standard of care in developed countries by means of a variety of analog numeric or pictorial scales. Little is known about the use of pain assessment tools in the developing world.

The detection of pain is a pressing need in emergency care for children unable to quantify the level of pain that they experience. Pain

has often been underestimated and undertreated in children for many years [3], and therefore children may be undertreated. Delayed management of pain in children has short- and long-term deleterious effects, including heightened pain perception, and increased morbidity and mortality [4-6]. Alternately, children might receive analgesics unnecessarily.

In Vietnam, there are few studies on pain assessment and pain management in children. We conducted a study to characterize pain levels in children admitted to the emergency department of a national-level tertiary referral hospital in northern Vietnam.

### Methods

This was a prospective, cross-sectional study of a convenience sample of pediatric patients admitted to the Emergency Department of the Vietnam National Children's Hospital in Hanoi, Vietnam during a 7 month period from 12/1/2014 to 3/31/2015. The hospital is a national-level, tertiary referral center for pediatric patients from a 31 million

catchment population for most of northern Vietnam. Parents of children age 1 month to 12 years gave written informed consent; adolescents over the age 12 provided their own written informed consent. Children who were in a coma, mentally retarded, receiving chronic analgesic therapy or who had had a sedative or analgesic administered within 6 hours prior to admission were excluded. No approach was made if the patient was predicted to die the ED or within 6 hours of admission.

All participants were assessed according to one of two easily administered age-specific pain scales on admission to the emergency department: The FLACC score (Figure 1A) for children less than 3 years old [7,8] and the Wong-Baker scale (Figure 1B) for children over three years of age [9]. Pain level was again assessed 6 hours later using the same scale. Pain levels were considered mild (score=1-3), moderate (score 4-6), or severe (7-10). Pain scores, administration of analgesics (Paracetamol or opioids), and basic patient demographic data were recorded concurrently on a standardized data entry form.

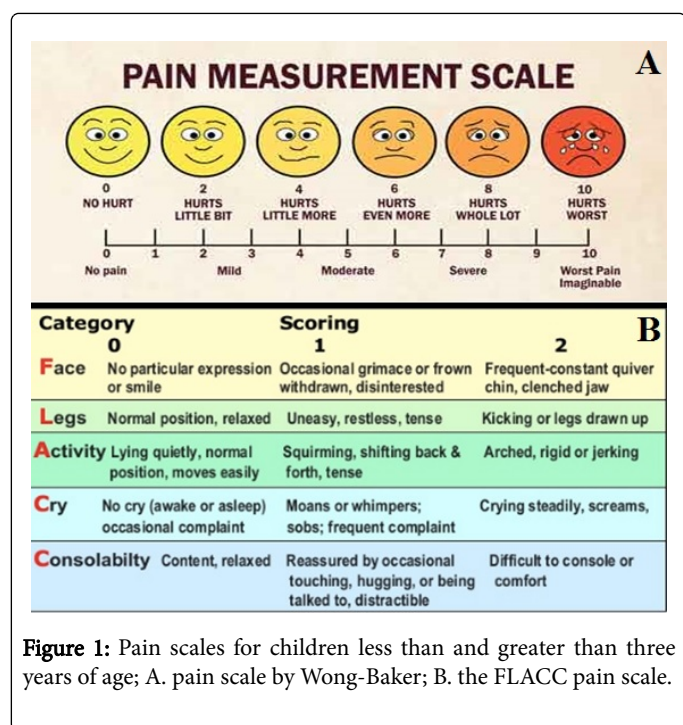


Figure 1: Pain scales for children less than and greater than three years of age; A. pain scale by Wong-Baker; B. the FLACC pain scale.

## Results

Pain scores	No analgesic given (N=1798)		Analgesic (N=42)		Total		p
	n	%	N	%	N	%	
0 (no pain)	356	19.8	0	0	356	0	<0.001
1-3 (mild pain)	745	41.4	1	2.4	746	40.5	
4-6 (moderate pain)	655	36.4	26	61.9	681	37.0	
7-10 (severe pain)	42	2.3	15	35.7	57	3.1	

Table 1: Pain scores on admission by treatment group.

There were 1225 (66.6%) male and 615 (33.4%) female children in the sample, a 2:1 sex ratio that we have described previously as typical for this emergency department [10]. The majority of patients were 1 month to 3 years (n=1221, 66.4%). The distribution of patients by pain level and treatment group is shown in Table 1. Overall, only 42 (2.3%) of 1840 patients received an analgesic.

On admission, 19.8% of the entire sample had pain scores of zero, while 40.5% received scores indicating mild pain. Moderate pain was recorded in 37%; only 3.1% were scored as having severe pain. Only 42 (2.3%) received an analgesic during the six-hour period in the emergency department. As expected, there were statistically significant differences in the frequency of analgesic administration as pain scores increased: One (0.1%) of 746 patients with mild pain, 26 (3.8%) of 681 patients with moderate pain and 15 (26.3%) of patients with severe pain (p<0.001).

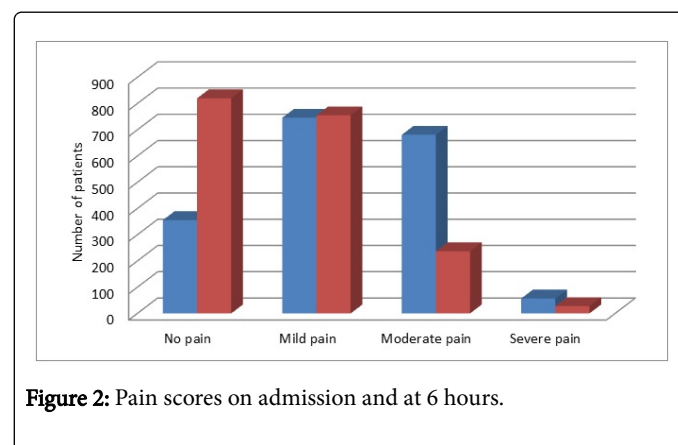


Figure 2: Pain scores on admission and at 6 hours.

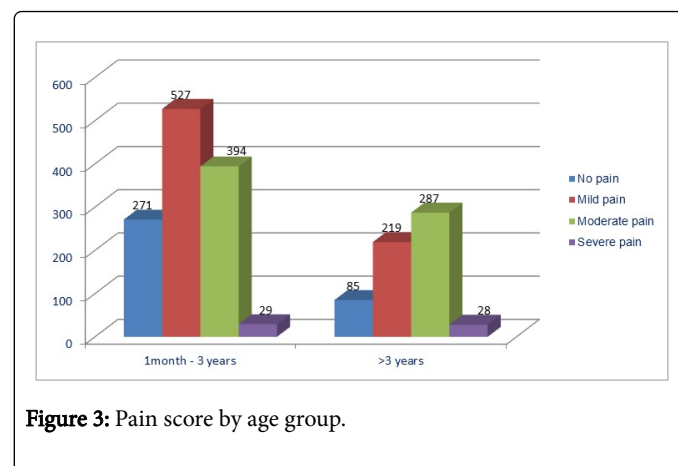


Figure 3: Pain score by age group.

Figure 2 shows the reduction in pain scores over the six-hour period in the emergency department. On admission, most of the participants had mild pain (40.5%) and moderate pain (37%), 57 suffered severe pain; the mean score was  $2.92 \pm 1.94$ . After 6 hours, 44.6% of the participants were free from pain, 41% suffered from mild pain and the mean score was  $1.59 \pm 1.79$ . Moderate and severe pain scores had decreased by 34.8% and 49.1%, respectively. Pain scores did not differ by age group or sex (Figures 3 and 4).

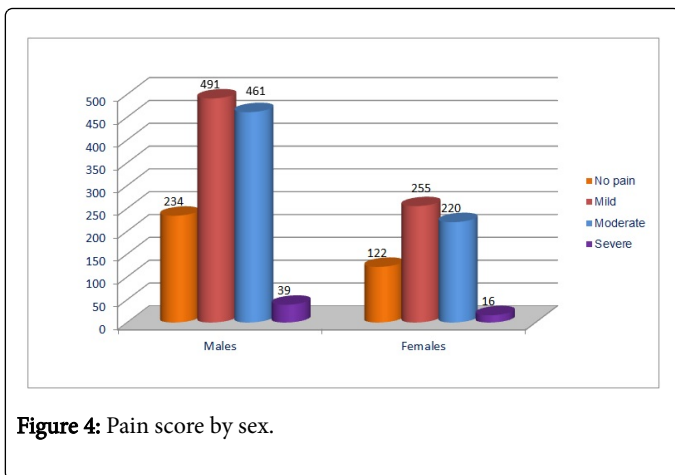


Figure 4: Pain score by sex.

Figure 5 shows the negative correlation between pain scores and time to the first analgesic dose ( $r=0.096$ ), patients with higher pain scores receiving medication more quickly those those with lower pain scores.

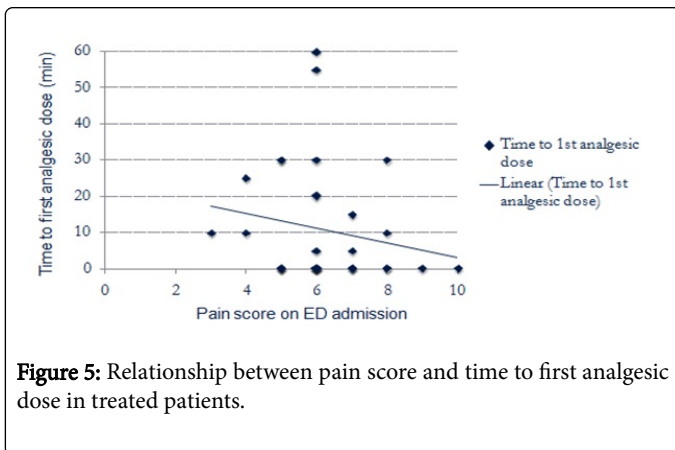


Figure 5: Relationship between pain score and time to first analgesic dose in treated patients.

## Discussion

The large number of young children unable to communicate their experience of pain is a problem for emergency physicians. Recognition of pain may be facilitated in young children by the use of age-appropriate standardized scales. Pain scores can be used to identify non-verbal children who need analgesia. They can also help minimize the risks of over-treatment with analgesics in patients with milder pain who could respond to other pain management methods.

The frequency of analgesic administration was significantly related to pain scores, suggesting that analgesics were administered to those with higher perceived pain. However, overall the number of patients receiving pain management was very low (42/1840 (2.3%)). However, only 26% of patients with severe pain received analgesia, suggesting that the recognition of pain does not necessarily prompt medicating patients likely to benefit from analgesia. Even when pain is recognized,

appropriate analgesia is often not provided. Thus, pain scores do not necessarily trigger providers to prescribe analgesics even when pain is assessed as severe. When an analgesic is administered, the time to first dose is shorter for high pain scores (moderate or severe pain), suggesting that emergency physicians who decide to prescribe an analgesic recognize the need to relieve pain promptly. There was an unequal, but not atypical, sex distribution in this sample, as in other reports [11,12], but there were no differences in pain scores by sex. This suggests that there is no preferential administration of analgesics according to the child's sex.

## Conclusion

Pain scales are an inexpensive method to improve pain management in pediatric emergency settings where healthcare resources are limited. Further training in pain management could increase physicians' willingness to provide analgesia when pain scores indicate a need for pain relief. Analgesics can be better directed to children with higher levels of pain, at the same time decreasing risks of overtreatment in those children who may not need analgesia.

## References

1. O'Neil CK (2008) Pain management, in pharmacotherapy principles and practice. The McGraw-Hill Companies, pp: 487-500.
2. Fernandes CL (2010) The fifth vital sign. *Fed Pract* 27: 26.
3. Astuto M, Rosano G, Rizzo G, Disma N, Cataldo AD (2007) Methodologies for the treatment of acute and chronic non-oncologic pain in children. *Minerva Anestesiologica* 73: 459-465.
4. Walker SM, Franck LS, Fitzgerald M, Myles J, Stocks J, et al. (2009) Long-term impact of neonatal intensive care and surgery on somatosensory perception in children born extremely preterm. *Pain* 141: 79-87.
5. Ranger M, Chau CM, Garg A, Woodward TS, Beg MF, et al. (2013) Neonatal pain-related stress predicts cortical thickness at age 7 years in children born very preterm. *PLoS One* 8: e76702.
6. Menon G, Anand KJ, McIntosh N (1998) Practical approach to analgesia and sedation in the neonatal intensive care unit. *Semin Perinatol* 22: 417-424.
7. Wells BG, Dipiro JT, Schwinghammer TL, Dipiro CV (2009) *Pharmacotherapy handbook* (7th edn.). The McGraw-Hill Companies Inc., US. pp: 614-628.
8. Woolf CJ (2004) Pain: Moving from symptom control toward mechanism-specific pharmacologic management. *Ann Intern Med* 140: 441-451.
9. Association of Paediatric Anaesthetists of Great Britain and Ireland (2012) *Good practice in postoperative and procedural pain management*, 2nd edition. *Pediatr Anesth* 22: 1-79.
10. Le HT, Truong HTM, Pham NT, Do VQ, Le DTT (2012) Patterns of disease distribution in the emergency department, Vietnam National Children's Hospital 2007-2011. *Med Pract J: Ministry of Health, Ha Noi, Vietnam*.
11. Acworth J, Babl F, Borland M, Ngo P, Krieser D, et al. (2009) Patterns of presentation to the Australian and Newzealand pediatric emergency research network. *Emerg Med Australas* 21: 59-66.
12. Kwak YH, Kim DK, Jang HY (2012) Utilization of emergency department by children in Korea. *J Korean Med Sci* 27: 1222-1228.