

## Assessment of Pain Management in Pediatric Emergency Department in Mashhad–Iran

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### Abstract

#### Introduction:

Pain may be described as a sensation of hurt or strong discomfort and is the body's way of sending message to the brain that an injury has occurred. Pain medicines block these messages or reduce their effect on the brain. Accurate administration of analgesia have a long –lasting effect on children whole experience of medical care and affects parents' and children's future reaction to pediatrics emergency departments. The purpose of this study was to evaluate pain management on children in our emergency department.

#### Materials and Methods:

In this study we evaluated the relief of pain and anxiety on 100 children who referred to our pediatric Emergency Department (ED) in Imam Reza Hospital- Mashhad .The patients were assessed based on the American Academy of Pediatrics (AAP) recommendations about pain.

#### Results:

Patients were gone under IV Line 97%, Intubation 5% and Lumbar Puncture 28%. Training had been provided to 70% participants in the Emergency Department. Nonpharmacologic stress reduction was used in 35% of cases. Family presence was allowed only in 5%. Prehospital pain controlling was began on 20% of patients and continued in ED on 40%. At the time of discharge 40% prescribed analgesics. Sedation and pain prophylaxis was provided for 10% of patients undergoing painful procedures in ED.

#### Conclusion:

According to results, pain management in our Pediatric Emergency Department was inadequate. Physicians and prehospital EMS providers should be justified about the importance of pain relieving and trained how to use all available analgesic and sedative options.

#### Key words:

Analgesic, Anxiety, Emergency Department, Pain, Pediatric.

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## Introduction

Pain may be described as a sensation of hurt or strong discomfort and is the body's way of sending message to the brain that an injury has occurred. Pain medicines block these messages or reduce their effect on the brain (1). Management of pain and stress in children is of significant importance in pediatric emergency departments. The treatment of acute pain and anxiety in children has a permanent effect on the entire emergency medical experience on a child's and family's reaction to future medical procedures. Using the pain assessment scales for children particularly in infants are with some limitations, but these scales can help us to choose the appropriate potency of analgesics. Availability of analgesia, sedatives and opioids and their antagonists has provided clinicians safe pain management for procedures outside the operating room. Using analgesics and treatment of anxiety in children undergoing therapeutic or diagnostic procedures in emergency departments has developed in the past few years yet; the management of pain in the Emergency Departments has not improved very well (2). The staff education and protocol development are needed to provide comfort to children in emergency setting and satisfy their family. There are various agents and techniques to relieve pain, including: narcotic and non-narcotic analgesics, techniques such as hypnosis and transcutaneous nerve stimulation (3-7). We designed this study to assess pain management in our pediatric emergency department in Mashhad Imam Reza Hospital, so that by knowing the incompetencies and promoting staffs' education in pain management, minimizing much more the pain and stress in our patients.

## Materials and Methods

In this study we evaluated pain and anxiety relieving in 100 children who referred to our Pediatric Emergency Department in Imam Reza Hospital of

Mashhad from 21<sup>th</sup> December 2012 to 20<sup>th</sup> March 2013. It was a descriptive and one arm blinded study, Thus the AAP recommendations come in check lists and filling by pediatric resident students asking ED nurses and EMS providers, while they were unaware of performing such a study. The AAP recommendations include:

1. Training and education in pediatric pain assessment and management should be provided to all participants in the EMS for children; EMS medical directors should formally include pediatric pain management measures within the protocols provided to EMS providers.
2. Incorporation of child life specialists and others trained in non-pharmacologic stress reduction can alleviate the anxiety and perceived pain related to pediatric procedures.
3. Family presence during painful procedures can be a viable and useful practice in the acute care setting.
4. Pain assessment for children should begin at admission to EMS, including pre-hospital management, and continue until discharge from the ED. When discharged, patients should receive detailed instructions regarding analgesic administration.
5. Administration of analgesics and anesthetics should be painless or as pain free as possible.
6. Neonates and young infants should receive adequate pain prophylaxis for procedures and pain relief as appropriate.
7. Administration of pain medication has been demonstrated to preserve the ability to assess patients with abdominal pain and should not be withheld.
8. Sedation or dissociative anesthesia should be provided appropriately for patients undergoing painful or stressful procedures in the ED.
9. Pain management and sedation, including deep sedation and dissociative anesthesia, are fully within the monitoring and management capabilities of

appropriately trained emergency medicine and pediatric emergency medicine physicians. Each emergency department that provides sedation and analgesia to children should include sedation competencies in recertifying procedures and develop protocols, policies, and quality improvement programs as part of the systematic approach to pain management in the EMS.

**Results**

The main procedures done to admit patients in ED were included IV line 97%, Intubation 5%, Lumbar Puncture 28%. Our emergency department's performance was assessed based on AAP criteria. Training and education had been provided to 70% health providers of Emergency Department (ED). Non-pharmacologic stress reduction was used in 35%. Family presence during painful procedures was allowed only in 5% of cases. Pre-hospital pain controlling was begun for 20%, continued in ED in 40% and at the time of discharge 40% were prescribed analgesics. Explaining instructions in details regarding analgesic administrations were done in 83% of them. Administration of analgesics and anesthetics was painless or pain free in 3%. Just 7% of neonates and young infants received adequate pain prophylaxis for procedures. Administration of pain medications was done for 45% of patients with abdominal pain. Appropriate sedation and pain prophylaxis were provided for 10% of patients undergoing painful or stressful procedures in our ED.

**Table 1:** Demographic characteristics of patients

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Characteristics		N (%)
Sex, N (%)	Male	49(49)
	Female	51(51)
	<1month	19(19)
Age, N (%)	1-24months	38(38)
	>24months	43(43)
	Analphabetic	9(9)
Level of parent s Education, N (%)	Non academic	85(85)
	Academic	6(6)

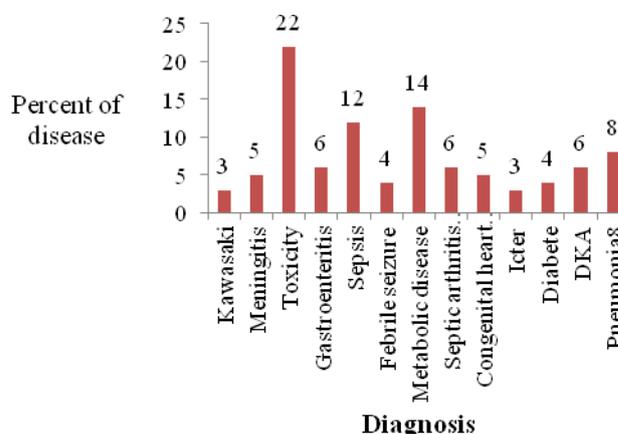
**Table 2:** Frequency of patients according to painful procedures

Procedure, N (%)	IV- Line	97(97)
	Lumbar puncture	28(28)
	Intubation	5(5)

**Table 3:** Frequency of patients according to received AAP pain management criteria

Management	%
Training and education	70
Non-pharmacologic stress reduction	35
Family presence during painful procedures	5
Pre-hospital pain controlling	20
pain controlling in ED	40
Analgesic prescription at the time of discharge	40
detailed about analgesic administrations	83
painless administration of analgesics	3
In neonates and young infants	7
In patients with abdominal pain	45
Appropriate sedation and pain prophylaxis	10

**Fig 1:** Frequency of patients according to Diagnosis



**Discussion**

As the pain management in children has a long-lasting effect on their whole experience of hospital and medical care and affects parents' and children's future reaction, pain controlling gets of significant importance in pediatrics emergency departments. Availability of analgesia, sedatives, opioids and their antagonists has

provided clinicians safe pain management for procedures outside the operating room. The staff education and protocol development are needed to provide comfort to children in emergency setting and satisfy their family. There are various agents and techniques to relieve pain, including: narcotic and non-narcotic analgesics, techniques such as hypnosis (3-5).

La Vonne A Downey et al demonstrate that adequate and appropriate pain management during the course of admission significantly increases the level of doctor- patient relationship, patients' contentment, convenience and their consent to treatment (2).

Aneringer S et al emphasize the need for education and training in pediatrics pain management in medical school. They designed a module for students and demonstrated that knowledge scores increased remarkably by 21.8 points comparing to pre-module scores (7).

As we did in our study, various studies evaluated pharmacologic and non-pharmacologic pediatric pain management in emergency departments. Wentz SJ in a systematic review suggests that using distraction, positioning, sucrose and cold application in pediatrics pain management may decrease pain, disturbance and anxiety of patient (8).

Po C et al in Italy reported that in their pediatric pain center, for procedural pain management in children, they organized a training program. In their study the most common performed procedures were lumbar puncture and bone marrow aspiration. They use pharmacologic agents such as intravenous midazolam alone or with propofol or ketamine and non-pharmacologic methods as distraction (using cartoons and bubbles) for pain management (9).

In a study, Corwin DJ et al in Philadelphia evaluated the effect of an organized intervention on pain management in childhood emergencies, and demonstrated that such an organized intervention can

improves the treatment and prevention of pain in children (10).

Frank LS et al in California performed a randomized controlled trial about parents' involvement in pain management for NICU infants with an intervention group and a group of control. Their results suggest no stress decreasing for parents in intervention group but, they had a better preparation to take an effective action in pain controlling of their child (11).

C rocker PJ et al analyzed the pain scores before and after the performance of a protocol for pain management. They demonstrated that implementation of the protocol may decrease the pain impression in PED visits (12).

The study of Kleiber et al shows that the majority of nurses rarely used any type of topical analgesic before Intra venous insertion in children or oral sucrose for other painful procedures in infants in rural hospitals. They suggested that health professionals in rural settings are especially in need of improving the use of protocols that recommended for pediatric pain management (13).

As our finding in this study, only 7% of neonates and young infants have received adequate pain prophylaxis for procedures and pain relief, in Julie Gorchynski et al study, they demonstrated that Emergency and Pediatric physicians did not administrate any procedural analgesia for neonates. They also demonstrated that Emergency and Pediatrics physicians differ in their option in the use of local anesthetics prior to LP and the type of local anesthetics varies by children age (14).

### **Limitations**

The study performed single center, and cannot determine the reason why a large number of patients did not receive significant pain relief. However, this study helps providers to design a comprehensive pain management protocol for children in ED.

## Conclusions

According to results, pain management in our Pediatric Emergency Department was inadequate. Physicians and pre-hospital EMS providers and nurses should be Justified and trained about the importance of pain relieving and how to use all available analgesics and sedative options.

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## References

1. The US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1992.
2. Vonne La, Downey A, Leslie S Zun. Pain management in the emergency department and its relationship to patient satisfaction. *J Emerg Trauma Shock*, 2010 Oct-Dec; 3 (4): 326-330.
3. Joel A, William T, Joseph P. Cravo. Relief of Pain and Anxiety in Pediatric Patients in Emergency Medical System. *Pediatrics* 2012; 130(5): e1391-405.
4. Probst, Beatrice D, Evelyn RN, Daniel BA, et al. Factors Affecting Emergency Department Assessment and Management of Pain in Children. *Pediatric Emergency Care* May 2005 ; 21(5):298-305.
5. Selbst SM. Managing pain in the pediatric emergency department. Emergency Department, Children's Hospital of Philadelphia, PA 19104. *Pediatric Emergency Care* 1989; 5(1):56-63.
6. Charles B, Berde, Navil F, Sethna. Analgesics for the Treatment of Pain in Children. *J Engl J Med* 2002; 47(3): 1094-1103.
7. Ameringer S, Fisher D, Sreedhar S, Ketchum JM, Yanni L. Pediatric pain management education in medical students: impact of a web-based module. *J Palliat Med* 2012; 15(9): 978-83.
8. Wentz SJ. Nonpharmacologic Pediatric Pain Management in Emergency Departments: A Systematic Review of the Literature. *J Emerg Nurs* 2013;39(2):140-50.
9. Po' C, Agosto C, Farina MI, Catalano I, Coccato F, Lazzarin P, et al. Procedural pain in children: education and management. The approach of an Italian pediatric pain center. *Eur J Pediatr* 2012; 171(8):1175-83.
10. Corwin DJ, Kessler DO, Auerbach M, Liang A, Kristinsson G. An intervention to improve pain management in the pediatric emergency department. *Pediatr Emerg Care* 2012; 28(6):524-8.
11. Franck LS, Oulton K, Nderitu S, Lim M, Fang S, Kaiser A. Parent involvement in pain management for NICU infants: a randomized controlled trial. *Pediatrics* 2011;128(3):510-8.
12. Crocker PJ, Higginbotham E, King BT, Taylor D, Milling TJ Jr. Comprehensive pain management protocol reduces children's memory of pain at discharge from the pediatric ED. *Am J Emerg Med* 2012; 30(6):861-71.
13. Kleiber C, Jennissen C, McCarthy AM, Ansley T. Evidence-based pediatric pain management in emergency departments of a rural state. *J Pain* 2011 Aug; 12(8):900-10.
14. Ghorchynsky J, McLaughlin T. The Routine Utilization of Procedural Pain Management for Pediatric Lumbar Punctures: Are We There Yet? *J Clin Med Res* 2011 August; 3(4): 164-7.