ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ - ORIGINAL PAPER

ΝΟΣΗΛΕΥΤΙΚΗ 2018, 57(2): 196–206 • **HELLENIC JOURNAL OF NURSING** 2018, 57(2): 196–206

Management of the Acute Pain in the Emergency Department

Antonia Kalogianni,[1] Niki Paulatou,[2]
Flora Efstathiou,[3] Eleni Touloupa,[4] Eleni Vasileiou,[5]
Georgia Toulia,[1] Eleni Athanasiou[6]

Διαχείριση του Οξέως Πόνου στο Τμήμα Επειγόντων Περιστατικών

Abstract at the end of the article

[1]Assistant Professor, Nursing Department of Faculty of Health and Caring Sciences, University of West Attica,
[2]Lecturer, Nursing Department of Faculty of Health and Caring Sciences, University of West Attica, Attica,
[3]RN, MSc, PhD(c) of Operating Room Department, "G. Gennimatas" General Hospital, Athens,
[4]MD, Director, Department of Pathology, "G. Papanikolaou" General Hospital of Kimi, Kimi,
[5]RN, MSc, Anesthesia department "Elpis" General Hospital, of Athens, Athens,
[6]MD, PhD Coordinator Director, Radiotherapy Department of "Agii Anargiri", General Oncological Hospital, of Kifissia, Attica, Greece

Υποβλήθηκε: 15/03/2018
Επανυποβλήθηκε: 23/04/2018
Εγκρίθηκε: 10/05/2018

Corresponding author:
Antonia Kalogianni, Ag. Spiridona street, GR-122 10 Aigaleo, Athens, Greece
Tel: (30) 210-53 85 612, 6974 707 446
Fax: (30) 210-53 85 699
e-mail: antonia_cal@yahoo.gr

Introduction: Acute pain is the number one complaint in emergency medical care. Despite the published recommendations the management of acute pain (AP) remains an unsolved problem in emergency care. **Aim:** The aim of this study was to evaluate the management of acute pain as well as the ordinary practice of administering analgesia in EDs. **Material and Method:** A six-month prospective correlation study was conducted, involving adult patients visiting EDs of Athens with AP. Pain intensity was measured by an 11-point Numerical Rate Scale (NRS) upon admission and before discharge from ED. **Results:** Mean level of pain upon admission was 7.0 (SD=1.9) and before discharge 4.2 (SD=2.4), ($p<0.001$). The 53.3% and 43.5% of patients complained of moderate and severe pain respectively. Before discharge, 7.3% of patients reported no pain, 29.7% mild, 51.5% moderate, while the percentage of those with severe pain decreased to 11.5% ($p<0.001$). Analgesia was administered to 64.2% of patients, while the main administered analgesics were non-opiods (35,8%). The 76.8% of patients with severe pain received analgesics while the percentage of those with mild or moderate pain was 54.5% ($p<0.001$). Mean time of administering analgesia was 48 minutes. **Conclusions:** AP was found to be inadequately treated. Opioids were underutilized for the relief of patients with severe pain. Time of administration of analgesia was not satisfactory and analgesics were not appropriate for the observed intensity of pain.

Key-words: *Acute pain management, emergency department, emergencies, analgesics, analgesia, opioids analgesics.*

Introduction

Acute pain is the number one complaint in emergency medical care. The under-treatment of acute pain in Emergency departments (EDs) is reflected by the high prevalence of severe pain at discharge and the insufficient administration of analgesics.[1–3] Prolonged pain affects psychologically and physiologically, complicates primary conditions, increases length of recovery time and adds to health care costs.

Pain management was identified as fundamental component of quality care for ED patients and is associated with patients' satisfaction.[4,5] According the College of Emergency Medicine and Irish Association of Emergency Medicine Clinical guidelines for pain management,[6,7] all ED patients should be asked to rate their pain with a numerical rating scale (NRS) and patients with moderate to severe pain should be offered pain medications within 20–30 minutes. The pain should be reassessed within 60 minutes after the first dose of medication.[8] However, the timely administration of analgesics seems to be difficult to achieve in EDs.[9] Despite the availability of effective analgesics, the analgesia received by patients is not always appropriate.[10–12]

Unfortunately there is a paucity of evidence around the definition and implementation of best practice standards in acute pain management.[9] The purpose of this study was to evaluate the management of acute pain as well as the ordinary practice of administering analgesia in EDs.

Material and Method

Study design and Setting

A six- month correlation prospective study was conducted at EDs of three urban hospitals from the area of Athens in Greece. The hospitals were selected on the basis of their interest in pain management. Investigators were not personnel of the ED of the hospitals studied.

Patients

Patients aged 18 years old and above visiting the ED with acute pain were eligible for study enrollment. Acute pain was defined as pain with a typical onset of a few hours to several days but not more than 3 months.[13] The main selection criterion for patients was the ability to speak and understand Greek. Exclusion criteria were history of mental disorders, communications difficulties (blindness and hearing loss) and life threatening condition.

Measurements and tools

The assessment packet included a survey to collect demographics, clinical data and information relating to pain management. Other information included the site of pain, the length of stay in ED, the time of medication delivery and the prescription of pain relieving medications. Data were collected after written authorization. All participants in the study were informed about the purpose of the study, data confidentiality and the voluntary nature of participation. The conduct of this study met all the basic principles of ethics according to Helsinki Declaration.

For the purposes of this study, the term "non opioids analgesics" means any medication except opioids and Non Steroidal Anti-Inflammatory Drugs (NSAIDs) that can reduce the pain such as paracetamol or the combination with boutylscopolamine. Non analgesics drugs but with effect on pain relief as gastric protectors, vasodilators and non pharmacological interventions as leg elevation or immobilization, ices etc also measured. The pain is evaluated using a numerical rating scale (NRS) which measures the degree of pain on an 11-point scale from 0 to 10, where 0 indicates no pain and 10 indicates the worst imaginable pain. The NRS has good descriminant power for indicating acute pain intensity in ED.[14] Patients were asked to rate pain intensity upon admission and before discharge from ED. A NRS score of 1–3 is defined as "mild pain", NRS score 4–6 "moderate pain" and NRS score 7–10 "severe pain".

Statistical analysis

Quantitative variables are expressed as mean values (SD) or as median values (interquartile range). Qualitative variables are expressed as absolute and relative frequencies. For the comparisons of proportions chi-square and Fisher's exact tests were used. Student's t-tests were computed for the comparison of mean values when the distribution was normal and Mann-Whitney test for the comparison of median values when the distribution was not normal. Kruskal-Wallis test was used for the comparison of time since admission for administration of analgesics according to site of pain. Spearman correlations coefficients were used to explore the association of two continuous variables. Repeated measurements analysis of variance (ANOVA) was conducted to compare the changes observed in pain levels from admission to discharge between different groups of patients. All reported p values are two-tailed. Statistical significance was set at $p<0.05$ and analyses were conducted using SPSS statistical software (version 19.0).

Results

Data from 751 patients (310 men and 441 women) with mean age 52.6 year (SD=19.6) were recorded. Sample characteristics are shown in table 1. Mean length of stay in the emergency department was 2.5 hours (SD=2.1). 30% of the patients visited the emergency surgical department, 7.5% the pathological department, 20.7% the cardiological department, 20.3% the orthopedic department, 17.8% the other surgical specialties such as neurosurgical etc and 3.6% the other pathological specialties such as neurological etc.

The mean level of pain recorded at admission was 7.0 (SD=1.9) and before discharge 4.2 (SD=2.4), indicating a significant reduction (figure 1). The proportion of patients with "mild pain" at admission was 3.2%, while the proportion of those with moderate and severe pain was 53.3% and 43.5%, respectively. Before discharge, 7.3% of patients reported no pain, 29.7% mild, 51.5% moderate, while the percentage of those with severe pain decreased to 11.5% (p<0.001) (figure 2).

Use of analgesics in general and according to pain levels at admission is shown at table 2. In total analgesics were administrated in 64.2% of the patients (11.6% received opioids, 18.4% NSAIDs, 0.7% vasodilators and 35.8% non-opioid analgesics). The 76.8% of patients with severe pain received analgesics while the percentage of those with mild or moderate pain was 54.5% (p<0.001). The percentage of patients that were administered opioids was 21.4% in those with severe pain and 4% in those with mild or moderate pain (p<0.001). Use of NSAIDs and vasodilators were not significantly different according to the pain levels while non-opioid analgesics were used frequently in those with greater levels of pain.

Table 1. *Sample characteristics.*

	N (%)
Sex	
Women	310 (41.3)
Men	441 (58.7)
Age, mean (SD)	52.6 (19.6)
BMI	
Normal	329 (43.8)
Overweight	294 (39.1)
Obese	128 (17.0)
Clinic	
Pathological	56 (7.5)
Surgical	224 (30.0)
Cardiological	155 (20.7)
Orthopedic	152 (20.3)
Other pathological specificity	27 (3.6)
Other surgical specificity	133 (17.8)
Length of stay in ED (hours), mean (SD)	2.5 (2.1)
Hypertension	
No	491 (65.4)
Yes	260 (34.6)
Diabetes	
No	618 (82.3)
Yes	133 (17.7)
SAP, mean (SD)	131.2 (19.0)
DPA, mean (SD)	77.8 (14.2)

BMI: Body Mass Index, SAP: Systolic arterial pressure, DPA: Diastolic arterial pressure

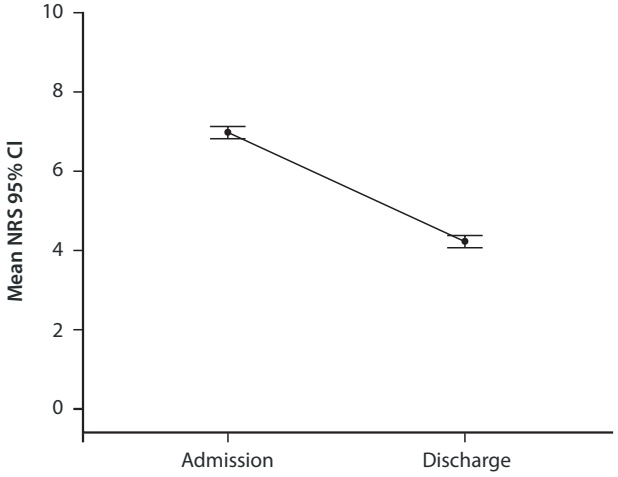

Figure 1. *Mean levels of pain upon admission and before discharge from Emergency Department.*

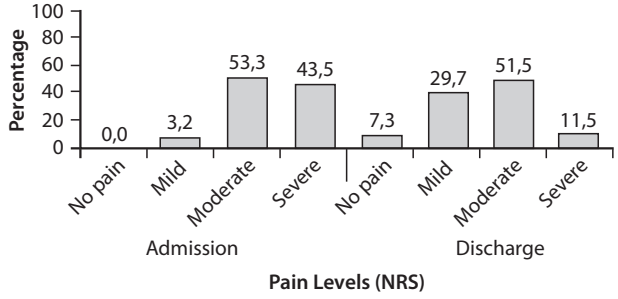

Figure 2. *Proportion of patients with mild, moderate and severe levels of pain upon admission and before discharge from Emergency Department.*

Table 2. *Pain levels at admission and use of analgesics*

	Total sample	Pain level (admission)		Pain levels (admission)		
				mild/Moderate	Severe	
	N (%)	Mean (SD)	P[a]	N (%)	N (%)	P[b]
Use of analgesics						
No	269 (35.8)	6.2 (2.0)	**<0.001**	193 (45.5)	76 (23.2)	**<0.001**
Yes	482 (64.2)	7.4 (1.8)		231 (54.5)	251 (76.8)	
Opioids						
No	664 (88.4)	6.8 (1.9)	**<0.001**	407 (96.0)	257 (78.6)	**<0.001**
Yes	87 (11.6)	8.4 (1.6)		17 (4.0)	70 (21.4)	
NSAIDs						
No	613 (81.6)	6.9 (2.0)	0.095	355 (83.7)	258 (78.9)	0.090
Yes	138 (18.4)	7.2 (1.8)		69 (16.3)	69 (21.1)	
Vasodilators						
No	746 (99.3)	7.0 (1.9)	0.115	419 (98.8)	327 (100.0)	0.072[c]
Yes	5 (0.7)	5.6 (0.9)		5 (1.2)	0 (0.0)	
Non-opioid analgesics						
No	482 (64.2)	6.7 (20)	**<0.001**	304 (71.7)	178 (54.4)	**<0.001**
Yes	269 (35.8)	7.4 (1.7)		120 (28.3)	149 (45.6)	

(a) Student's t-test, (b) Pearson's chi-square test, (c) Fisher's exact test. NSAIDs Non Steroidal Anti-Inflammatory Drugs.

Use of analgesics according to site and the character of pain are presented in table 3. Use of analgesics was more frequent in cases of upper back, lower back, abdomen and chest pain. Use of opioids was more frequent in cases of pain of lower back and vasodilators were administrated only to patients with chest pain. Non-opioid analgesics were more frequently used in patients with pain of lower back, multiple sites and abdomen. Furthermore, analgesics and specially NSAIDs were administrated more frequently in cases with constant rather than intermittent pain. The pain was described as constant by the 67.5% of the patients and as intermittent by the 32.5%.

Gastroprotection was administered in 47.5% of the patients that received analgesics and was more frequently used in cases that NSAIDs and non-opioid analgesics were administered (table 4).

The time from admission to ED until the administration of analgesics had a mean equal to 48 minutes and median equal to 25 minutes and was greater in patients with pain at head and neck, abdomen and low back (table 5). The time from admission until the administration of analgesics was not significantly correlated with levels of pain at admission (r=0.04, p=0.397).

In cases where analgesics were administered, pain levels at admission were greater but lower at discharge, while the mean reduction in pain levels was greater in patients that received analgesics (table 6). The pain levels at admission were similar between those with constant pain and those with intermittent pain but at discharge pain levels were lower in those with constant pain. The overall pain reduction was greater in those with constant pain. Additionally, there was a greater reduction of pain in patients with pain at lower back and multiple sites. A low but significant correlation was found between the time of admission and the time of administration of analgesics and change in pain levels from admission to discharge (r=0.19, p<0.001), indicating that earlier administration of analgesics is associated with greater reduction in pain levels.

Discussion

This study evaluated the management of acute pain in EDs. According to our results the acute pain in ED patients despite the published guidelines[6,7,15] continues to be untreated. Timely administration of analgesia was not satisfactory and the delivered analgesics were not appropriate for the observed intensity of pain. However,

Table 3. *Use of analgesics according to site and character of pain*

	Site of pain								Character of pain		
	Upper and lower limb	**Genitalia and perineum**	**Chest**	**Head and neck**	**Abdomen**	**Low back**	**Multiple site**		**Constant**	**Intermittent**	
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**P[a]**	**N (%)**	**N (%)**	**P[a]**
Total sample	130 (17.3)	10 (1.3)	191 (25.4)	19 (2.5)	298 (39.7)	95 (12.6)	8 (1.1)		507 (67.5)	244 (32.5)	
Use of analgesics											
No	81 (62.3)	7 (70.0)	60 (31.4)	11 (57.9)	104 (34.9)	4 (4.2)	2 (25.0)	**<0.001**	162 (32.0)	107 (43.9)	**0.001**
Yes	49 (37.7)	3 (30.0)	131 (68.6)	8 (42.1)	194 (65.1)	91 (95.8)	6 (75.0)		345 (68.0)	137 (56.1)	
Opioids											
No	115 (88.5)	10 (100.0)	169 (88.5)	17 (89.5)	263 (88.3)	83 (87.4)	7 (87.5)	0.978[b]	453 (89.3)	211 (86.5)	0.249
Yes	15 (11.5)	0 (0.0)	22 (11.5)	2 (10.5)	35 (11.7)	12 (12.6)	1 (12.5)		54 (10.7)	33 (13.5)	
NSAIDs											
No	117 (90.0)	9 (90.0)	169 (88.5)	18 (94.7)	255 (85.6)	38 (40.0)	7 (87.5)	**<0.001**	391 (77.1)	222 (91.0)	**<0.001**
Yes	13 (10.0)	1 (10.0)	22 (11.5)	1 (5.3)	43 (14.4)	57 (60.0)	1 (12.5)		116 (22.9)	22 (9.0)	
Vasodilators											
No	130 (100.0)	10 (100.0)	186 (97.4)	19 (100.0)	298 (100.0)	95 (100.0)	8 (100.0)	**0.045[b]**	502 (99.0)	244 (100.0)	0.180[a]
Yes	0 (0.0)	0 (0.0)	5 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		5 (1.0)	0 (0.0)	
Non-opioid analgesics											
No	109 (83.8)	8 (80.0)	158 (82.7)	16 (84.2)	157 (52.7)	31 (32.6)	3 (37.5)	**<0.001**	314 (61.9)	168 (68.9)	0.064
Yes	21 (16.2)	2 (20.0)	33 (17.3)	3 (15.8)	141 (47.3)	64 (67.4)	5 (62.5)		193 (38.1)	76 (31.1)	

(a) Pearson's chi-square test, (b) Fisher's exact test. NSAIDs: Non Steroidal Anti- Inflammatory Drugs.

Table 4. *Use of gastroprotection in patients who received analgesics.*

	Gastroprotection		
	No	Yes	
	(N=253; 52.5%)	(N=229; 47.5%)	
	N (%)	N (%)	P
Opioids			
No	198 (50.1)	197 (49.9)	**0.027[a]**
Yes	55 (63.2)	32 (36.8)	
NSAIDs			
No	203 (59.0)	141 (41.0)	**<0.001[a]**
Yes	50 (36.2)	88 (63.8)	
Vasodilators			
No	250 (52.3)	228 (47.7)	0.625[b]
Yes	3 (75.0)	1 (25.0)	
Non-opioid analgesics			
No	107 (50.0)	107 (50.0)	0.328[a]
Yes	146 (54.5)	122 (45.5)	

(a) Pearson's chi-square test, (b) Fisher's exact test, NSAIDs: Non Steroidal Anti- Inflammatory Drugs.

Table 5. *Time since admission for administration of analgesics according to pain levels and site of pain.*

	Time since admission for administration of analgesics		
	Mean (SD)	Median (IQR)	P
Total sample	48.0 (84.4)	25 (15–60)	-
Pain levels (admission)			
Mild/Moderate	41.9 (49.4)	30 (15–50)	0.086[a]
Severe	53.3 (106.0)	20 (10–60)	
Site of pain			
Upper and lower limb	30.8 (25.9)	20 (15–45)	<0.001[b]
Genitalia and perineum	20.0 (18.0)	15 (5–40)	
Chest	32.0 (41.5)	15 (10–30)	
Head and neck	31.0 (20.2)	30 (17.5–40)	
Abdomen	71.4 (121)	30 (15–90)	
Low back	30.3 (25.2)	30 (10–45)	
Multiple site	40.0 (55.2)	17.5 (10–40)	

(a) Mann-Whitney test, (b) Kruskal-Wallis test.

there was a significant reduction in pain intensity at discharge of ED.

To our knowledge this study is the first prospective survey that documented and assessed the acute pain management of ED patients in Greece. The study of Pappas et al evaluated the presence of age based differences regarding the management of acute abdominal pain in the ED.[16] The investigators focused on clinical presentation and diagnosis but they did not measure the pain intensity or the analgesics admin-

Table 6. *Change in pain levels according to use of analgesics, site and character of pain.*

	Pain				
	Admission	**Discharge**	**Change**		
	Μέση τιμή (SD)	**Μέση τιμή (SD)**	**Μέση τιμή (SD)**	**P[a]**	**P[b]**
Total sample	7.0 (1.9)	4.2 (2.4)	–2.8 (2.4)	<0.001	–
Use of analgesics					
No	6.2 (2.0)	4.5 (2.4)	–1.7 (2.2)	<0.001	**<0.001**
Yes	7.4 (1.8)	4.1 (2.4)	–3.3 (2.3)	<0.001	
P[c]	**<0.001**	**0.050**			
Site of pain					
Upper and lower limb	6.3 (2.2)	3.9 (2.3)	–2.4 (2.2)	**<0.001**	**<0.001**
Genitalia and perineum	5.7 (1.4)	4.0 (1.8)	–1.7 (2.7)	**0.022**	
Chest	6.8 (1.8)	4.4 (2.5)	–2.4 (2.2)	**<0.001**	
Head and neck	7.1 (2.3)	4.5 (2.0)	–2.6 (2.3)	**<0.001**	
Abdomen	7.3 (1.8)	4.7 (2.4)	–2.6 (2.5)	**<0.001**	
Low back	7.1 (1.8)	3.3 (2.1)	–3.8 (2.2)	**<0.001**	
Multiple	6.5 (1.9)	3.5 (2.0)	–3.0 (1.5)	**<0.001**	
P[c]	**<0.001**	**<0.001**			
Character of pain					
Constant pain	7.0 (1.9)	4.0 (2.4)	–3.0 (2.4)	**<0.001**	**<0.001**
Intermittent pain	6.9 (2.0)	4.8 (2.2)	–2.1 (2.2)	**<0.001**	
P[c]	0.360	**<0.001**			

(a) p-value for time effect, (b) Effects reported include differences between the groups in the degree of change (repeated measurements ANOVA), (c) p-value for group effect.

istration. Recently Velissaris et al assessed the acute abdominal pain in ED of a university hospital in Greece but they did not investigate the delivery of analgesia.[17] No prospective study so far has investigated the management of patients arriving to Greek EDs with main complaint the acute pain.

Our study revealed a gap between patients needs for analgesia and actual delivery of analgesics. Pain management is a fundamental aspect and a quality indicator of emergency care. The inadequacy in treatment of pain in the EDs is a well recognized problem worldwide.[10–12] Although we did not investigate the barriers of insufficient management of pain, the subjectivity of pain, misapprehension, preconceptions of health care providers, crowded ED and increased workload are some of the reported causes of ineffective management of acute pain in ED.[18]

In our study only the two thirds of patients with severe pain received analgesic medication indicating the insufficient pain management. Similar findings have been announced by other researchers.[19] Dale and Bjornsen showed that only 14.3% of the patients who reported moderate to severe pain received treatment for the pain.[20] In the multicenter study of Todd and al it is reported that 46% of patients with moderate pain and 70% of patients with severe pain received analgesics in the ED.[10] Pierik et al, reported that only the 46.8% of patients with moderate to severe musculoskeletal pain were offered analgesics.[21]

In our study the 39% of the patients visited ED because of abdominal pain. There is a prevailing view particularly among surgeons that prediagnostic analgesia in patients with acute abdominal pain obscures the clinical symptoms and signs of a potential threatening situation for patients live.[22] There is also evidence that the intravenous administration of paracetamol is currently the analgesic of choice in the emergency room treating patients with abdominal pain.[23] That fact may explain the

reason that ED staff did not deliver pain medication to all the patients with moderate and severe pain. On the other hand the authors of the Cohrane review conclude that the use of opioid analgesics does not increase the risk of diagnosis error or the risk of error in making decisions regarding treatment for the patients with acute abdominal pain.[24]

We found that the most common prescribed pain medication was "non opioids" with main drug paracetamol and was used frequently in those with greater levels of pain. NSAIDs were the second choice while less than the one quarter of patients with severe pain received opioids. This finding indicates that opioids are underutilized for relief of patients with severe pain and the delivered analgesics were not the appropriate. Although the published guidelines suggest that practitioners treat severe pain with opioids or NSAIDs, the inappropriate analgesic medication in emergency care remains a problem. Opiods are considered the treatment of choice for moderate to severe pain and they are recommended for patients who are unresponsive to other types of analgesics agents. In the study of Todds and al , the median pain score of patients was 8 and the 59% of analgesics administered were opiods while only the 7,2% of the patients received paracetamol.[10] In the Fathil et al study it was found that less than half of patients who visited ED with median pain score 7 received analgesics but the prescribed medication was appropriate.[25] The study of Wilder-Smith, et al based on the subjected self assessment of surgeons and anesthesiologists in Swiss hospitals, found that morphine was the most frequently used opioid (41%) while the propacetamol and ketorolac (26%) were the most frequently used "non opioid" analgesics in the emergency room.[26] The investigators concluded that there was no compliance with published practice guidelines for acute pain management.

On the other hand, national projects for improving pain management have shown adherence to recommended medication for pain treatment.[27] Numerous factors can contribute to inadequate pain management including lack of sufficient physician training, misconceptions of patients about opioid use.[18] In our study, the time since admission for administration of analgesics had a mean equal to 48 minutes and median equal to 25 minutes. Additionally, the time since admission for administration of analgesics was not significantly correlated with severity of pain at admission. Guidelines recommend that efforts must be made to improve the timeliness of pain management and specifically to reduce it to 20–30 minutes from the arrival at ED. The clinical effectiveness committee of the College of Emergency Medicine (CEM) set the standards for the treatment of pain within 20 minutes of arrival in the ED.[6]

Some researchers have concluded that the standard of 30 minutes between arrival at ED and administration of first analgesia is difficult to achieve in the ED where access to care is commonly delayed for many reasons.[28] Although timely provision of analgesia is an important part of emergency care and an indicator of the quality of care there are reports of delayed analgesia.[29] Studies that investigated the effectiveness of specific interventions to shorten the time of administration of analgesia although they recorded a significant reduction failed to achieve the goal of 30 minutes.[27,30] There is evidence that implementing nurse-initiated analgesic administration protocols for patients with moderate and severe pain can safely decrease the required to administer ED analgesics.[31,32,21] Such interventions need an additional attention and it is very important for hospitals to develop best practice standards for acute pain management.

In our study the delay to analgesia delivery may be due to the crowded EDs of Greek hospitals and the increased workload that in the present study were not measured. Another explanation is that because providers focus more on diagnosis than pain control and because of their believing that treatment of pain may cover the clinical presentation of the illness.

We found that pain intensity dropped more than 2 points in NRS from the arrival to discharge the ED and despite the recorded oligoanalgesia and inappropriate analgesia there was a significant reduction of the proportion of patients with pain at discharge. Similar results are reported in the study of Todds and al who found a 2-point or greater reduction in NRS while the three quarters of patients were discharged with moderate (45%) or severe (29%) pain.[10]

Limitation of study

This study was the first one to be conducted in Greece which investigated the acute pain management of EDs and recorded the intensity of pain and the administration of analgesics. However, there were some limitations that may affect the generalization of results. Due to the limited number of investigators we were unable to recruit

all the patients who fulfilled the inclusion criteria of the study. Although the EDs of study hospitals were urban, one of them was less crowded and may have affected the results with regards to the time of administration of analgesia. We recognize the omission of the study to record the initial assessment of pain of patients at admission to EDs from emergency staff. This information would be important for better understanding of pain management in Greek hospitals. Furthermore, the presence of investigators during the study period may lead to treatment bias by the ED personnel.

Conclusion

In conclusion, acute pain management in Greek EDs does not meet the international recommendations and guidelines for acute pain management in ED. The treatment of acute pain found to be inadequate. Timely administration of analgesia was not satisfactory and analgesics were not appropriate for the observed intensity of pain. Opioids are underutilized for relief of patients with severe pain while non "opioids drugs" were the most prescribed pain medication of patients with moderate or severe pain. Efforts to educate all health care practitioners on assessing and managing acute pain may improve the quality of emergency care of patients with acute pain. Pain protocol based on international guidelines must be implemented in order to improve pain management in EDs setting.

Acknowledgment: The authors would like to thank all the patients who participated in the study as well as the personnel of EDs for their help in collecting data. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ΠΕΡΙΛΗΨΗ

Διαχείριση του Οξέως Πόνου στο Τμήμα Επειγόντων Περιστατικών

Αντωνία Καλογιάννη,[1] Νίκη Παυλάτου,[2]
Φλώρα Ευσταθίου,[3] Ελένη Τουλούπα,[4] Ελένη Βασιλείου,[5]
Γεωργία Τουλιά,[1] Ελένη Αθανασίου[6]

[1]Επίκουρη Καθηγήτρια, Τμήμα Νοσηλευτικής της Σχολής Επαγγελμάτων Υγείας και Πρόνοιας του Πανεπιστημίου Δυτικής Αττικής,
[2]Λέκτορας, Τμήμα Νοσηλευτικής της Σχολής Επαγγελμάτων Υγείας και Πρόνοιας του Πανεπιστημίου Δυτικής Αττικής, Αττική,
[3]Νοσηλεύτρια, MSc, PhD(c) Χειρουργείο, Γενικό Νοσοκομείο Αθήνας «Γ. Γεννηματάς», Αθήνα,
[4]Ιατρός, Διευθύντρια, Παθολογικού Τμήματος, Γενικό Νοσοκομείο Κύμης «Γ. Παπανικολάου», Κύμη,
[5]Νοσηλεύτρια, MSc, Αναισθησιολογικό Τμήμα, Γενικό Νοσοκομείο Αθήνας «Ελπίς», Αθήνα,
[6]Ιατρός, PhD Συντονίστρια Διευθύντρια του Τμήματος Ακτινοθεραπείας του Γενικού Ογκολογικού Νοσοκομείου Κηφισιάς «Άγιοι Ανάργυροι», Αττική

Εισαγωγή: Ο οξύς πόνος αποτελεί τη συχνότερη αιτία επίσκεψης στο Τμήμα Επειγόντων Περιστατικών (ΤΕΠ). Παρά τις δημοσιευμένες διεθνείς συστάσεις, η αντιμετώπιση του οξέος πόνου (ΟΠ) παραμένει ένα άλυτο πρόβλημα στην επείγουσα περίθαλψη. **Σκοπός:** Σκοπός αυτής της μελέτης ήταν η αξιολόγηση της αντιμετώπισης του οξέος πόνου καθώς και της συνήθους πρακτικής χορήγησης αναλγησίας στο ΤΕΠ. **Υλικό και Μέθοδος:** Διεξήχθη προοπτική μελέτη συσχέτισης, διάρκειας έξι μηνών, στην οποία συμμετείχαν ενήλικοι ασθενείς που επισκέφτηκαν το ΤΕΠ τριών γενικών νοσοκομείων με κύριο ενόχλημα τον ΟΠ. Η ένταση του πόνου μετρήθηκε με μια αριθμητική κλίμακα 11 σημείων (NRS) κατά την εισαγωγή στο ΤΕΠ και πριν από την έξοδο. **Αποτελέσματα:** Η μέση τιμή πόνου κατά την εισαγωγή ήταν 7,0 (SD=1,9) και πριν από την έξοδο 4,2 (SD=2,4), (p<0,001). Το 53,3% και το 43,5% των ασθενών παραπονέθηκαν για μέτριο και σοβαρό πόνο αντίστοιχα. Πριν την έξοδο από το ΤΕΠ, το 7,3% των ασθενών ανέφερε καθόλου πόνο, το 29,7% ανέφερε ήπιο πόνο, 51,5% ανέφερε μέτριο πόνο, ενώ το ποσοστό των ατόμων με σοβαρό πόνο μειώθηκε σε 11,5% (p <0,001). Αναλγησία χορηγήθηκε στο 64,2% των ασθενών, ενώ τα συχνότερα χορηγούμενα αναλγητικά ήταν μη οπιοειδή (35,8%). Αναλγησία έλαβε το 76,8% των ασθενών με σοβαρό πόνο

και το 54,5% των ασθενών με ήπιο ή μέτριο πόνο (p <0,001). Ο μέσος χρόνος χορήγησης αναλγησίας ήταν 48 λεπτά. **Συμπεράσματα:** Ο ΟΠ στο ΤΕΠ δεν αντιμετωπίστηκε επαρκώς. Τα οπιοειδή δεν ήταν τα φάρμακα εκλογής για την ανακούφιση ασθενών με έντονο πόνο. Ο χρόνος χορήγησης της αναλγησίας δεν ήταν ικανοποιητικός και τα αναλγητικά δεν ήταν κατάλληλα για την παρατηρούμενη ένταση του πόνου.

Λέξεις-ευρετηρίου: *Διαχείριση οξέος πόνου, τμήμα επειγόντων περιστατικών, επείγοντα περιστατικά, αναλγητικά, αναλγησία, οπιοειδή αναλγητικά.*
✉ **Υπεύθυνος αλληλογραφίας:** Αντωνία Καλογιάννη, Άγ. Σπυρίδωνα, 122 10 Αιγάλεω, Αθήνα, Τηλ: (+30) 210-53 85 612, 6974 707 446, Fax: (30) 210-53 85 699, e-mail: antonia_cal@yahoo.gr

Βιβλιογραφία

1. Berben SA, Meijs TH, van Dongen RT, van Vugt AB, Vloet LC, Mintjes-de Groot JJ, et al. Pain prevalence and pain relief in trauma patients in the Accident & Emergency department. *Injury* 2008, 39:578–585
2. Tcherny-Lessenot S, Karwowski-Soulié F, Lamarche-Vadel A, Ginsburg C, Brunet F, Vidal-Trecan G. Management and relief of pain in an emergency department from the adult patients' perspective. *J Pain Symptom Man* 2003, 25:539–546
3. Mura P, Serra E, Marinangeli F, Patti S, Musu M, Piras I et al. Prospective study on prevalence, intensity, type, and therapy of acute pain in a second-level urban emergency department. *J Pain Res* 2017, 12:2781–2788
4. Lecky F, Benger J, Mason S, Cameron P, Walsh C. IFEM Quality Symposium Working Group. The International Federation for Emergency Medicine framework for quality and safety in the emergency department. *Emerg Med J* 2014, 31:926–929, doi: 10.1136/emermed-2013-203000
5. Bhakta HC, Marco CA. Pain management: association with patient satisfaction among emergency department patients. *J Emerg Med* 2014, 46:456–464, doi:10.1016/j.jemermed.2013.04.018
6. The College of Emergency Medicine. Best practice guidelines Management of Pain in Adults –December 2014 Retrieved from: https://www.rcem.ac.uk/docs/College%20Guidelines/5w.%20Management%20of%20Pain%20in%20Adults%20(Revised%20December%202014).pdf [assessed 15-1-2018])
7. Irish Association of Emergency Medicine Clinical Guideline 1 Emergency Department Analgesia in Adults. Retrieved from: http://www.hse.ie/eng/services/publications/Clinical-Strategy-and-Programmes/pain-mgmt-adults-iaem-clinical-guidelines.pdf[assessed 15-1-2018])
8. Cantrill SV, Brown MD, Carlisle RJ, Delaney KA, Hays DP, Nelson LS, et al. American College of Emergency Physicians Opioid Guideline Writing Panel. Clinical policy: critical issues in the prescribing of opioids for adult patients in the emergency department. *Ann Emerg Med* 2012, 60:499–525, doi: 10.1016/j.annemergmed.2012.06.013
9. Hatherley C, Jennings N, Cross R. Time to analgesia and pain score documentation best practice standards for the Emergency Department - A literature review. *Austr Emerg Nurs J* 2016, 19:26–36, doi:10.1016/j.aenj.2015.11.001
10. Todd KH, Ducharme J, Choiniere M, Crandall CS, Fosnocht DE, Homel P et al. PEMI Study Group. Pain in the emergency department: results of the pain and emergency medicine initiative (PEMI) multicenter study. *J Pain* 2007, 8:460–466
11. Ducharme J, Tanabe P, Homel P, Miner JR, Chang AK, Lee J, et al. Pain and Emergency Medicine Initiative Study Group. The influence of triage systems and triage scores on timeliness of ED analgesic administration. *Am J Emerg Med* 2008, 26:867–873, doi: 10.1016/j.ajem.2007.11.020
12. Rupp T, Delaney KA. Inadequate analgesia in emergency medicine. *Ann Emerg Med* 2004, 43:494–503
13. Merskey H, Bogduk N. *Classification of chronic pain. Descriptions of chronic pain syndromes and definitions of pain terms*. Report by the International Association for the Study of Pain, Task Force on Taxonomy. 2nd ed. IASP Press, Seattle, 1994
14. Berthier F, Potel G, Leconte P, Touze MD, Baron D. Comparative study ofmethods of measuring acute pain intensity in an ED. *Am J Emerg Med* 1998, 16:132–136
15. Savoia G, Coluzzi F, Di Maria C, Ambrosio F, Della Corte F, Oggioni R et al. Italian Intersociety Recommendations on pain management in the emergency setting. *Minerva Anestesiol* 2015, 81:205–225
16. Pappas A, Toutouni H, Gourgiotis S, Seretis C, Koukoutsis I, Chrysikos I et al. Comparative approach to non-traumatic acute abdominal pain between elderly and non-elderly in the emergency department: a study in rural Greece. *J Clin Med Res* 2013, 5:300–304
17. Velissaris D, Karanikolas M, Pantzaris N, Kipourgos G, Bampalis V, Karanikola K et al. Acute Abdominal Pain Assessment in the Emergency Department: The Experience of a Greek University Hospital. *J Clin Med Res* 2017, 9:987–993
18. Sinatra R. Causes and consequences of inadequate management of acute pain. *Pain Med* 2010, 11:1859–1871
19. Pines JM, Hollander JE. Emergency department crowding is associated with poor care for patients with severe pain. *Ann Emerg Med* 2008, 51:1–5

20. Dale J, Bjørnsen LP. Assessment of pain in a Norwegian Emergency Department. *Scand J Trauma Resusc Emerg Med* 2015, 29, 23:86
21. Pierik JG, Berben SA, IJzerman MJ, Gaakeer MI, van Eenennaam FL, van Vugt AB et al. A nurse-initiated pain protocol in the ED improves pain treatment in patients with acute musculoskeletal pain. *Int Emerg Nurs* 2016, 27:3–10
22. Nissman SA, Kaplan LJ, Mann BD. Critically reappraising the literature-driven practice of analgesia administration for acute abdominal pain in the emergency room prior to surgical evaluation. *Am J Surg* 2003, 185:291–296
23. Falch C, Vicente D, Häberle H, Kirschniak A, Müller S, Nissan A et al. Treatment of acute abdominal pain in the emergency room: a systematic review of the literature. *Eur J Pain* 2014, 18:902–913, doi:10.1002/j.1532-2149.2014.00456.x
24. Manterola C, Vial M, Moraga J, Astudillo P. *Analgesia in patients with acute abdominal pain*. Cochrane Database Syst Rev 2011, 19:CD005660, doi:10.1002/14651858.CD005660.pub3
25. Fathil SM, Soong NS, Mustafa NM, Arith A, Ng WN, Bahrum NA et al. Audit of pain management in the emergency department. *Med J Malaysia* 2011, 66:89–91
26. Wilder-Smith OH, Möhrle JJ, Martin NC. Acute pain management after surgery or in the emergency room in Switzerland: a comparative survey of Swiss anaesthesiologists and surgeons. *Eur J Pain* 2002, 6:189–201
27. Doherty S, Knott J, Bennetts S, Jazayeri M, Huckson S. National project seeking to improve pain management in the emergency department setting: findings from the NHMRC-NICS National Pain Management Initiative. *Emerg Med Australas* 2013, 25:120–126
28. Patrick PA, Rosenthal BM, Iezzi CA, Brand DA. Timely pain management in the emergency department. *J Emerg Med* 2015, 48:267–273, doi:10.1016/j.jemermed.2014.09.009
29. Arendts G, Fry M. Factors associated with delay to opiate analgesia in emergency departments. *J Pain* 2006, 7:682–686
30. Nelson BP, Cohen D, Lander O, Crawford N, Viccellio AW, Singer AJ. Mandated pain scales improve frequency of ED analgesic administration. *Am J Emerg Med* 2004, 22:582–585
31. Fry M, Holdgate A. Nurse-initiated intravenous morphine in the emergency department: efficacy, rate of adverse events and impact on time to analgesia. *Emerg Med* (Fremantle) 2002, 14:249–254
32. Fry M, Ryan J, Alexander N. A prospective study of nurse initiated panadeine forte: expanding pain management in the ED. *Accid Emerg Nurs* 2004, 12:136–140