ORIGINAL ARTICLE

PAIN MANAGEMENT: THE USE OF A PROTOCOL FOR NURSING TRIAGE IN THE EMERGENCY DEPARTMENT


Key words: analgesia, clinical assessment, effectiveness, emergency department, nursing, pain control

ABSTRACT

Aim: Pain management is an important element in an emergency department (ED). Based on existing guidelines for pain management a protocol was devised our emergency department allowing for the administration of an analgesic (World health organization levels 1 and 2) by the nurse without a medical prescription. The main objective of this study was to assess nurse compliance with the ED pain protocol. The secondary objective was to determine its effectiveness in reducing pain.

Methods: Design: Prospectively collected observational project following establishment of the protocol. Patients: All patients older than 15 with a Visual analog core (VAS) result > 0 were eligible for the study. Exclusion criteria were evidence of alcohol or drug intoxication, or inability to speak.

Results: Data collection sheets were completed for 226 patients. The protocol was followed exactly in 13% of patients. Nurses assessed pain and administered only a single analgesic without giving ketoprofen in 10% of cases. They evaluated pain and gave an incorrect analgesic to another 66% of patient. They gave an analgesic without documenting a pain assessment in 2% of patients. For all patients, the VAS did not significantly change between the nurse and the doctor assessment despite interval nurse analgesic administration (4.27 ± 1.49 versus 4.6 ± 2.83 respectively; p=0.27).

Discussion: The nurses in our ED do not follow the pain protocol as they should. A good training is required for an effective pain management. The issuances of analgesic limited to level 1 analgesic are insufficient.

Authors’ affiliation:
Correspondent author: Nicolas SEGAL, MD, PHD
Department of Emergency Medicine, Lariboisière University Hospital
2, rue Ambroise Paré, 75010, Paris, France
dr.nicolas.segal@gmail.com

Segal N, MD, PhD1, Durand-Stocco C, MD1, Truchot J, MD, MPh1, Ouled N, MD1,
Youngquist ST, MD, MS2, Plaisance P, MD, PhD1
1. University of Paris Diderot, Sorbonne Paris Cité, UMR5 942, AP-HP, Hôpital Lariboisière, Emergency department, F-75018 Paris, France
2. University of Utah, Emergency department, Salt Lake City Utah, USA

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INTRODUCTION

Pain is the most frequent symptom experienced by patients in the emergency department (ED), up to 78% of the patients in some studies [1]. However, studies have shown that as many as 70% of the patients do not receive analgesics [2-5], leading to Wilson’s concept of oligo-analgesia [2].

To increase pain management the American pain society (APS) suggests that clinicians routinely document a pain score as “the fifth vital sign” [6]. To insure a significant decrease of pain it is necessary to improve the frequency and [7], the speed of analgesic administration [8]. One way to achieve this goal is to allow the triage nurse to deliver analgesics [9]. The majority of ED patients are willing to receive pain medication from a nurse, before being evaluated by a physician [10]. It has been shown that the use of an education program and implementation of standing-order protocols for pain management lead to improved pain management, analgesia, and patient satisfaction in the ED [3,7]. By contrast, when there is no ED protocol, approximately 60% of patients suffer oligo-analgesia or lack analgesia completely [7].

The aim of this study was to measure triage nurse compliance with an ED pain management protocol allowing them to deliver analgesia prior to evaluation by a physician. Secondaries aim were to compare the mean pretreatment Visual analog score (VAS) pain scores recorded by the triage nurse and posttreatment scores recorded by the physician and to compare differences in pain reduction between analgesic regimens.

MATERIALS AND METHODS

This study was a review of existing medical records and prospectively collected observational project following establishment of the protocol from a Level 1 Trauma Center, 1324 bed teaching hospital in Paris, France. This urban ED sees 65,000 adult patients per year and serves a population of 800,000. The study took place over a 15 days period. All patients older than 15 with a VAS result > 0 were eligible for the study. Exclusion criteria were evidence of alcohol or drug intoxication, or inability to speak.

Intervention

A protocol allowing the triage nurse to administer analgesics was developed by in the department. Nurses and physicians were educated regarding the protocol by the head nurse of the ED prior to initiation of the protocol and retraining was done every three months.

The protocol directs the triage nurse to evaluate pain with the VAS for all patients presenting to the ED. If the VAS is greater than zero the nurse is directed to deliver an analgesic or a combination of analgesics (Table 1). Allowable analgesics can be separated in two categories by the World health organization (WHO): classical analgesics (acetaminophen and codeine-acetaminophen) and non-steroidal anti-inflammatory drugs (NSAIDs, ketoprofen). In addition to the analgesic the triage nurse is directed to provide general comfort measures such as warming a cold patient, putting a cold compress on a traumatic area or placing a cervical collar, and reassuring the patient and his family. For patients whose wait time exceeded one hour, a reassessment of pain was required one hour after the first evaluation.

Measurements

For each subject, the triage nurse and subsequently the treating physician asked the subject to rate the pain intensity using a VAS. The timing and the type of administered analgesics were recorded in the medical record and on a standardized form.

Instrument

A standard 10 cm horizontal VAS with end descriptors of “no pain” and “worst imaginable pain” were used (in French “pas de douleur” and “douleur maximale imaginable”).

Endpoints

The primary endpoint of this study was proportion of cases in which triage nurses complied with the ED pain protocol. Secondary endpoints included analgesic effectiveness as defined by a clinically significant reduction in the VAS pain score by at least 1.3 cm between triage nurse and physician recorded

### Table 1: Nurse pain management protocol

<table>
<thead>
<tr>
<th>Pain of traumatic origin</th>
<th>Pain of non-traumatic origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ≤ VAS ≤ 3</td>
<td>1 g of acetaminophen</td>
</tr>
<tr>
<td></td>
<td>And 150 mg of ketoprofen</td>
</tr>
<tr>
<td></td>
<td>1 g of acetaminophen</td>
</tr>
<tr>
<td>4 ≤ VAS ≤ 6</td>
<td>1 g of codeine-acetaminophen</td>
</tr>
<tr>
<td></td>
<td>And 150 mg of ketoprofen</td>
</tr>
<tr>
<td></td>
<td>1 g of codeine-acetaminophen</td>
</tr>
<tr>
<td>VAS ≥ 7</td>
<td>Warn a staff doctor</td>
</tr>
<tr>
<td></td>
<td>Warn a staff doctor</td>
</tr>
</tbody>
</table>

Additional Measures: Patients who are visibly cold should be given a warm blanket. A cold compress should be placed over injured areas if appropriate. Place a cervical collar in cases of traumatic neck pain. Reassurance should be expressed to the patient and the family.
pain scores and differences in VAS change between analgesic regimens. Per protocol the nurses can give analgesic treatment only to patients with a VAS between 1 and 6, while those with a VAS ≥ 7 requires a medical prescription and were excluded from analysis of secondary endpoints because these patients are moved immediately to a physician for evaluation and treatment.

**Data and Processing**

Using a standardized form, the main investigator abstracted data from medical records and from the structured questionnaires completed by the staff and entered data into an Excel spreadsheet (Microsoft Corp, Redmond, WA, USA) which was then imported into SPSS® Statistics 19 for statistical analysis. Normally distributed values are expressed as mean ± standard deviation (SD). The primary end point, determined a priori, was the percentage of cases compliant with the protocol. The Student’s paired t-test was used for comparing mean pretreatment VAS pain scores recorded by the triage nurse and posttreatment scores recorded by the physician. To compare differences in pain reduction between analgesic regimens, a one way analysis of variance (ANOVA) with a Tukey post hoc was used. A p < 0.05 was considered statistically significant.

**RESULTS**

During the two weeks of the study 226 patients were included in the protocol. Mean age was 42 ± 16 years, 117 men were included (52%). Non-traumatic pathology accounted for 126 patients (56%).

The compliance of the triage nurses to the protocol is detail in table 2. Overall, the nurses recorded a pretreatment VAS for 202 patients (89%). None of the seven patients with a VAS at 0 did receive a treatment. A VAS between 1 and 6 was found in 105 cases (47%). Among those 42 (40%) received an analgesic, 21 (20%) received analgesia according the protocol, five (5%) had a contraindication to the analgesics, five (5%) refused the analgesics and 53 (50%) who should have received a treatment did not. The one hour pain reassessment was performed in only two cases (1%).

<table>
<thead>
<tr>
<th>n (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The nurses followed the protocol faithfully</td>
<td>30 (13.3%)</td>
</tr>
<tr>
<td>The nurses followed the protocol faithfully including an NSAID delivery</td>
<td>1 (0.4%)</td>
</tr>
<tr>
<td>They recorded the VAS and gave a classical analgesic but forgot to administer an NSAID</td>
<td>22 (9.7%)</td>
</tr>
<tr>
<td>They recorded the VAS without giving the recommended classical analgesic</td>
<td>95 (42%)</td>
</tr>
<tr>
<td>They recorded the VAS without giving the recommended classical analgesic and forgot NSAID</td>
<td>54 (23.9%)</td>
</tr>
<tr>
<td>They gave an analgesic without recording the VAS to five patients (%)</td>
<td>5 (2.2%)</td>
</tr>
<tr>
<td>They neither recorded the VAS nor gave an analgesic</td>
<td>19 (8.4%)</td>
</tr>
</tbody>
</table>

Table 2: Triage nurse compliance to pain management protocol in the ED. n (%)

To assess the effectiveness of the protocol at reducing pain scores while awaiting physician assessment, we compared the pretreatment VAS recorded by the triage nurse and the VAS recorded by the doctor when he sees the patient for the first time. In an intention-to-treat analysis among the group of patients with a pretreatment VAS between 1 and 6, the VAS did not significantly change between the nurse and the doctor (4.27 ± 1.49 versus 4.6 ± 2.83 respectively; p = 0.27). In the subgroups of patient with VAS between 1 and 6 and, which received the analgesic regimen according protocol, the VAS did not significantly change between the nurse and the doctor (4.2 ± 1.7; 5.6 ± 2.7 respectively; p = 0.06).

Comparing the VAS change among different analgesic regimens, the one way ANOVA found a significant difference between people who received no analgesic, people who receive a level 1 analgesic, and people who receive a level 2 analgesics (p < 0.001) The post hoc analysis also found some difference (Figure 1, Table 3).

**DISCUSSION**

We found poor compliance to our triage nurse analgesic protocol. The main error consisted of not delivering the recommended NSAID (ketoprofen). We did not measure reasons for non-compliance; however, there may be institutional bias against the use of NSAIDs, particularly in that some of the ED staff doctors do not like to use NSAIDs in the ED. The nurses may also not...
believe the addition of NSAIDs to acetaminophen containing analgesics to be necessary for adequate pain control. And the inertia of personal habit may have been too great to overcome with the implementation process we employed. If we consider the patient for whom the protocol has perfectly been respected and those whom only lack NSAIDs, we have 23% (13.3% + 9.7%) of our patient who received a pain treatment in agreement with the guidelines [11]. This corresponds to a low figure when compared to the study of Decosterd et al. [7]. They have done a before after study with an educational program in between which resulted in an increase in appropriate analgesic administration from 40% to 63%.

Despite the training regularly received by the nurses in our department, many continue to believe, anecdotally, that they are able to adequately assess patient pain without using a validated scale despite the numerous studies already carried out in the literature which demonstrate differences in pain perception between the patient and the caregiver [12-15]. By assessing pain in 89.4% of the cases, the nurses in our study achieved a result superior to many studies which have results from 40% to 72% [7;13]. While high compliance with standardized pain assessment is commendable, this result must be tempered by the fact that only 39% of patients who should have received an analgesic got one. Most other such studies show better results: from 44% to 82% [2;3;7;9;12].

Reassessment of pain after administration of analgesics is essential in reaching the goal of adequate analgesia [16]. The reassessment in only 1% of the cases is a major weakness in our department, which may contribute to an oligoanalgesia and precludes a more rigorous analysis of analgesic efficacy.

None of our patient complaint of having a nurse delivering a medication at triage before any medical consultation even if five patients refuse medication. It confirm that most patients are willing to receive pain medication by a nurse [10].

It has been previously reported that a 13-15 mm decline in VAS score was clinically significant in detecting pain relief [5]. In our study, even with an aggressive analgesia with WHO level 2 analgesics by the triage nurse we did not find a significant decrease in pain. While mean VAS scores actually went up over the interval between triage nurse assessment/analgesic administration and evaluation by a physician, a failure to reassess pain after one hour, coupled with variable wait times to see the physician, make it impossible to assess true pain trajectories with current data.

Various prior studies have identified the principal barriers in nurse practice: deficiencies in education of the caregiving staff which relegated analgesia to a secondary importance [17,18] fear of side effects related to morphinics [19-21], the concept of inevitability of pain in emergency situations [4;19], the necessity to preserve the pain symptom in order to establish a diagnosis [21;22], in particular abdominal pain that many surgeons consider that it should not be treated before their evaluation [22]; the notion of priority given to vital sign distress; and most importantly the poor assessment skills of pain by nurses [15;18;20;22], and lack of or inaccurate knowledge of the nurses for pain management [14;21]. When the emergency nurses knowledge is analyzed [21], the principal deficits identified are: inadequate staff knowledge of pain management principles, lack of understanding of the difference between physical dependence, addiction, and tolerance, responsibility of caring for other acutely ill patients, lack of time to adequately assess and control pain, patients reluctance to report pain, use of alcohol or other recreational drugs by patients. Other factors such as sex, ethnicity, age, language, education, cultural and socioeconomic backgrounds are also associated with disparities in treatment [23-25].

**Limitation**

Our study has several limitations, primarily the relatively small size of our study. This may explain the absence of difference when people receive WHO level 1 and 2 analgesics. The large number of studies actually being conducted in the department is one of the explanations found for the low number of patients included, as well as the heavy workload in the ED.

**CONCLUSIONS**

Likely due to pre-existing institutional biases, the triage nurses in our institution were poorly compliant with a protocol directing analgesic administration at triage. Better training is required for an effective pain management protocol in this setting. It can improve the observance of the management of pain by nurse. The issuances of analgesic limited to level 1 analgesics are insufficient. A generalization of the issue of level 2 analgesics delivered by the triage nurse seems to be a good solution to further improve the management of pain.

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**AUTHOR CONTRIBUTIONS**

All authors conceived, designed, and supervised the conduct of the study.
REFERENCES