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Pain management of trauma patients in the emergency department: a study in a public hospital in Iran

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ABSTRACT

Background: Pain is a common problem which the patients in emergency departments (ED) face, especially trauma patients under treatment may suffer from physical, psychological and ethical issues. The purpose of this study was to evaluate traumatic pain management in the emergency department at a public hospital in Iran in 2014.

Methods: This observational prospective study was conducted on 450 trauma patients admitted to a trauma emergency department. The tool used in this study has three parts: demographic data, data of trauma, and VRS (Verbal Rating Scales) score at a 7-point scale-at the arrival time to 4 h later. The statistical analysis was conducted by using Mann-Whitney and Kruskal-Wallis tests, repeated measures, survival analysis, and multiple regression analysis.

Results: The majority of the samples were male (83.3%) with the mean age of 35.2 years. The patients mostly suffered from contusions and strains (42.4%). The majority of the patients [274 patients (60.8%)] received no intervention for pain relief and only 60 patients (13.3%) received analgesics. The mean time period of the first analgesic utilization was 41 (± 20.4) minutes. Pain in admission, pain assessment, and receiving intervention could explain the 32% of pain reduction. No other variables such as age, sex, education, kind of trauma, and the shift of admission were involved in pain reduction.

Conclusions: This research study demonstrated that comprehensive, adequate pain management remains an obscure goal within the emergency nursing setting. There is a need to undertake further research and develop educational programs on effective analgesic practice in pain management.

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1. Background

Acute pain is a general reason that brings patients to the emergency department (ED) for help. More than 78% of the patients waiting in emergency departments complain of pain [11]. Patients with acute trauma pain, especially musculoskeletal trauma, are usually triaged with a less urgent category which typically results in an extended waiting time for pain relief. A review showed that nurses underestimate the pain intensity of musculoskeletal pain in 95% of the patients, resulting in insufficient pain relief [19].

Uncontrolled pain has adverse physiological effects such as unstable hemodynamic status, mydriasis, paleness, sleep disorder, and alterations in immune system functioning. Moreover, it has a variety of psychosocial effects, including anxiety, posttraumatic

stress disorder, and disorientation [27]. In this context, the efficient and rapid control of pain seems to be essential in ED. Efficient pain control has moral, ethical, legal, and clinical dimensions [9]. Even the relief of pain has been described as a primary goal in emergency medical services [16,31]. The management of pain in trauma patients relied on non-pharmacologic techniques such as splinting fractures and administering a range of pharmacological agents such as opioids and non-steroidal anti-inflammatories [16].

Despite great improvements in pain management strategies, several studies showed that pain is repeatedly undertreated in ED. Underestimation of the pain levels, overestimation of pain relief and in general the oligoanalgesia, (the inadequate prescribing of analgesics for patients in pain) are common in ED [6,13]. A study conducted in the United States and Canada showed that only 60% of patients with pain received analgesics, whom were administered after lengthy delays (median, 90 min), and 74% of patients were discharged in moderate to severe pain [30].

Poor accuracy of pain assessment, ED crowding, personnel's knowledge and attitudes about pain, and organizational structures

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can lead to the under-assessment and under-treatment of pain [20,22,24]. There is a gap between clinicians and patients caused by the nurses who underestimate the patients' pain, which is in turn a barrier to appropriate pain management [22,25]. In Iran, Modanloo et al. [15] reported that overestimation of pain by patients results in underestimation of pain by nurses and vice versa [15].

There are many protocols and strategies for pain management in the ED but still their implementation depends highly on physicians' and nurses' points of views. Rampanjato et al. [23], in Central Africa, reported that many nurses believe that taking medication for pain is a sign of weakness; they supposed that pain is a predictable result of injury, and pain relief could interfere with treatment [23]. On the other hand, reducing unnecessary pain in acute settings is health care professionals' commitment to ensure the protection of patients' rights [12,14]. Importantly, pain management is a key performance indicator in ED [16].

The first step in improving the pain management in the ED is to assess the current situation. There is a need for evidence-based measures of pain management for the actual care being provided in the ED in both assessment and treatment [26]. In this regard, this study aims at assessing traumatic pain management in the emergency department at a public hospital in Iran in 2014.

2. Methods

2.1. Study design and setting

The present study is an observational prospective study conducted in the emergency department (ED) of a public hospital in Kashan/Iran in September 2014. This hospital is the only educational public hospital in Kashan city that provides medical services for about 400,000 people. This is a referral hospital in the region, which covers the crowded and vital highways connecting south to the north of Iran. This fact explains the rate of 80–100 admissions per day (30,000 per year) in the ED of this hospital, where is mostly overcrowded and the nurse to patient ratio is sometimes 1/9. At arrival, the patients are assessed by a triage nurse before being examined by a physician.

2.2. Subjects

Obtaining the approvals of institutional research board and hospital administrative, all the patients arriving to the trauma-ED center, who met the inclusion criteria, were recruited sequentially to the study. The inclusion criteria are: (1) injuries due to trauma, (2) older than 18 years of age, (3) stabilized condition regarding Airway, Breathing and Circulation, (5) Glasgow Coma Scale score >13 (on a 3–15-scale where 3 indicates no sign of neurological function and 15 is full neurological function), (6) having pain (at least score 1) according to verbal rating scale, and (7) the ability to answer the questions. The patients who required cardiopulmonary resuscitation, endotracheal intubation, or transferring to intensive care units during data collection and those who were addicted and had opiate abuse were excluded from the study. The sample size was determined by using the formula ($n = z^2pq/E^2$) and this assumption that the prevalence of the patients reporting pain in the ED is 75% [2], as well as 95% confidence interval, and 4% error. The sample size was 450. Patients were entered sequentially in the study.

2.3. Assessment tools

The assessment tool used in this study was developed by the authors in three parts. In the first part, the demographic variables

including age, sex, and education and also information about the trauma such as the site of pain, the kind of trauma and the cause of trauma were recorded. In the second part, the pain severity was measured with Verbal Rating Scale (VRS) from 0 to 10 where 0 shows no pain and 10 indicates the most severe pain one can have. Moderate pain was defined as 4–6, while severe pain was considered as 7–10. VRS documented to be a valid and reliable measure of pain severity when compared to the patients' self-reports using the Visual Analog Scale in the emergency department [4]. In the third part, the time of the pain assessment and the pharmacological and non-pharmacological interventions were recorded. The validity of the assessment tool was confirmed by the experts in the emergency department and its inter-rater reliability was estimated as 0.92.

2.4. Data collection

The first part of the instrument was completed in emergency department (ED) by interviewing the patients and they were entered into this study according to the inclusion criteria. The pain of the patients was assessed within a time period from admission to 4 hours after admission. If patients were discharged sooner, the data collected during their stay was entered into the analysis.

The pain intensity was evaluated at the time of arrival in the ED and then at 30, 60, 90, 120, 180, and 240 min later by the nurses in the morning shift. Identifying and organizing the nurses, the selected nurses were asked to complete the study tool and record the pain intensity in the evening and night shifts. At the beginning, the patients were trained how to use VRS. The patients were told to rate their pain severity from 0 (having no pain) to 10 (the most severe pain they could have). They were told that their pain would be recorded frequently. Then, they were asked about the severity of pain in certain time sections as mentioned above. The third part of the tool that is dealing with pain assessment and the interventions for pain relief was completed by the patients' charts.

2.5. Data analysis

Data were statistically analyzed using SPSS16 and were described by frequencies, means and standard deviations. The normality of data on pain intensity was measured by Kolmogorov-Smirnov tests. The pain intensity was analyzed in different sub-groups using Mann-Whitney and Kruskal-Wallis tests. In order to compare the length of stay in the ED for different pain intensity groups, the survival analysis, life table, and Wilcoxon (Gehan) statistics were used. The pain intensity in different time sections was analyzed by the repeated measure. The multiple regression analysis was used to identify the variables that make a significant correlation with pain reduction; the significance level for all the tests was at 0.05.

2.6. Ethical considerations

The ethical committee of the University of Medical Sciences in Kashan approved the study protocol under the ethical approval number P/29/5/1/2154. Furthermore, the study proposal was approved by the hospital administration. This study has been funded by the research deputy of the University of Medical Sciences in Kashan with the grant No. 9392. The written informed consent was signed by all the subjects and they could quit the research any time during the research. The patients were assured that their personal information is kept confidential. The study protocol was based on Helsinki declaration.

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