

Pain management among adult patients with fractures of long bones at Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania

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Abstract: Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage and is one of the leading complaints in emergency departments (EDs). Despite the importance and the advantages of pain control, still patients do not receive appropriate attention. The objective of this study was to assess pain management among adult patients with fractures of long bones at Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania. A descriptive Cross-sectional study design (Hospital based) was used. Total of 250 patients aged 18 – 60 years old with fractures of long bones were recruited from March to June 2008. Structured questionnaires and observation guide were used to collect data. Verbal rating scale was used, to determine the intensity of pain. The study shows that there is no documentation for pain assessment or reassessment at Emergency Department. Slightly above half (54%; 135/250) of patients were not given analgesics. The commonest analgesic given was diclofenac sodium (46%). There was no patient given opioids (pethedine/ morphine). The rate of analgesics administration or splinting before and after admission did not differ between sexes ($P=0.314$ vs $P= 0.230$) and ($P=0.314$ vs $P= 0.114$), respectively. Almost half (47.0%) of them spent >20 min to 1 hour before the administration of analgesics. After administration of analgesia 76% of the patients continued to have severe to moderate pain. A large proportion (62.4%; $N=156/250$) of the patients scored their pain as severe. Of these, 28 (17.9%) patients received analgesia within 20 min, 42 (26.9%) after 30-60 min and 73 (46.8%) were not given analgesics at all. In conclusion pain at Moi Orthopaedic Institute is under treated. It is important that this is addressed properly to minimize pains among patients attending hospitals for fracture management.

Key words: fracture, long bones, pain management, analgesics, Tanzania

Introduction

Despite agreement by investigators and clinicians that certain painful conditions, such as long bone fracture, invariably merit pain medication, studies have shown that as many as 70% of patients with acute painful conditions do not receive any pain medications at the Emergency Department (EDs) (Lewis *et al.*, 1994; Wendel, 2001). Several factors contribute to under-treatment of pain. These include improper reporting, poor communication, inadequate education of health providers, and misconceptions on the part of patients and health care providers as well as reluctance to prescribe opioids and to take medications (McGrath, 2006; Rampanjato *et al.*, 2007; Layzell, 2009).

The control of pain is a major concern for orthopaedic surgeons. Good pain control is not only more pleasant for the patient but can also lead to earlier mobilization, faster rehabilitation, improved patient satisfaction, and possibly earlier discharge from the hospital (Bourne, 2004; Maheshwari *et al.*, 2006; Peters *et al.*, 2006; Busch *et al.*, 2006; Ritsema *et al.*, 2006). Unrelieved pain is likely to cause adverse effects on more than one body system,

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particularly in high-risk surgical patients. It can also lead to chronic pain, may cause reductions in arterial inflow and venous emptying. Inadequately treated pain may also be the cause of long un-anticipated hospital stay.

Failure to prescribe analgesics for pain management has been reported in a number of studies. For instance, of 198 patients evaluated in a study in New York, more than half of the patients received no analgesics medications while waiting in the emergency room; and over two thirds waited for more than one hour before receiving analgesia. Yet, of those receiving analgesics, one third received less than optimal analgesic doses (Motov & Khan, 2009). In a study in Costa Rica, there was inadequate pain management with 41% all patients showing little or no pain relief at discharge (Jantos *et al.*, 1995). In Rwanda, patients with a Visual analogue scale score of ≥ 7 received their analgesic medication at 150 min, which was significantly longer than for those who had pain scores of < 7 (McGrath, 2006).

Currently, a variety of choices is available for pain management. These include narcotics (both oral and intravenous), nerve blocks, pain pumps, epidural injections, nonsteroidal anti-inflammatory drugs, opioids patches, and muscle relaxants. Similarly, there is a variety of orthopaedic procedures, each with different pain management possibilities such as splinting (Skinner, 2004). Optimal application of pain control methods depends on the cooperation among health care teams throughout the course of treatment. It is important to note that analgesic aims not only to eradicate pain but also to facilitate early ambulation. It has been noted that physicians exaggerate the danger of opioid addiction and are more likely to prescribe lower doses of the drug in the treatment of pain leading to the under-treatment of the patient's pain (Lewis *et al.*, 1994).

The Joint Commission on Accreditation of Healthcare Organizations in the USA has set up standards for pain management. Despite of pain control importance and national focus, there is little evidence that the quality of pain management has improved (Eder *et al.*, 2003). It could be that health care providers do not believe the patient's severity of pain because of a significant discrepancy between the self-report and the patient's behaviour (Wendel, 2001). It is also likely that health care provider are often more concerned about making the correct diagnosis than providing symptomatic relief (Eder *et al.*, 2003) or it could also be due to shortage of supply of analgesic. This study was therefore carried out to determine pain management, analgesic prescribing pattern and adequacy of pain relief at the Muhimbili Orthopaedic Institute in Tanzania.

Materials and Methods

This study was carried out at the Emergency Department (ED) of the Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania. The Institute has a bed capacity of 150 and receives patients from within Dar es Salaam and neighbouring regions as well as referred patients from all regions and districts of Tanzania. The Emergency Department attends about 500 trauma patients per month. A descriptive hospital based cross-sectional study design was used. The study population included patients with fracture of long bone and aged between 18 and 60 years, who attend the ED. All patients with long bones fractures seen at department during March to June 2008 were recruited until the sample size was achieved. The sample size estimation was calculated using the formula by Kirkwood (2003).

Exclusion criteria were those patients who attended ED after a period of more than eight hours post injury, with multiple injuries, mentally ill, abnormal level of consciousness, with diabetes or leprosy, peripheral neuropathy or stroke. Patients with severe head injuries, patients with intra-articular fractures and open fractures were also excluded due to the injury to the skin, capsule and synovial membrane which add more pain than other shaft fractures.

A Kiswahili structured questionnaire was used for data collection. The questionnaire sought information on demographic characteristics, type, dose, and adequacy of analgesic given within three hours following admission. The information about diagnosis and drug type, dose, route of administration and timing was obtained through review of patient's file, treatment chart and admissions register.

Visual analogue scale (VAS) was used to assess the effect of analgesics in pain relief. For the purpose of this study verbal rating scale was used, which is among a type of visual analogue scale. With VAS, mild pain (1 to 2 score) describe a sense of discomfort that can be ignored and does not prevent the patient from sleeping; moderate pain (3 to 6 score) is pain that may disturb the patient's sleep; severe pain (7 to 9 score) is the pain that prevents the patient from sleeping; and worst pain (10 score) the pain that is completely unbearable. The study subject was interviewed by a research assistant (registered nurse) with knowledge, ability and experience in research to categorise their pain according to rating scale. **Patients were rating their pain and compared to the guidelines of pain management as developed by British Association of Accidents and Emergency (Shah & Lendrum, 2002).**

Data analysis

Data cleaning and analysis was done using SPSS version 11. Univariate analysis and frequency distribution were run for categorical variables while continuous variables were summarised using means and standard deviations (SD). Chi-square test was used to compare differences between proportions. Verbal rating scale was used to determine severity of the pain.

Ethical considerations

The study received ethical approval from Muhimbili University of Health and Allied Sciences Research Ethics Committee. Each patient gave an informed consent before enrolled into the study.

Results

A total of 250 patients with long bone fractures were interviewed. Males accounted for the majority of (76%; N=189) of the patients. The overall mean age was 34.6 ± 11.7 years (range=18-60 years). The mean age did not differ between males (34.5 ± 11.7 years) and females (35.0 ± 11.8), ($P=0.313$). Most of the patients interviewed had primary education (57%). One-third of the patients had no education while 8% and 2% had secondary and tertiary education, respectively. Education level did not differ between males and female ($P=0.895$).

The commonest bone fracture for both males and females was fracture of the tibia and fibula accounting for 44% (111/250) of all fractures. The least fractured bone was

humerus 12% (30/250). The distribution of bone fracture did not differ between sex ($p=0.118$) (Table 1). Communitated fracture was the commonest type of fracture, accounting for 44% ((111/250) of all fractures (Table 1). The type of fracture did not differ significantly between the sexes ($P=0.84$).

Table 1: Distribution of bone fracture by sex

Type of bone	Frequency n (%)			p- value
	Male	Female	Total	
Humerus	21 (11.1)	9 (14.)	30 (12)	0.118
Radius / Ulna	32 (16.9)	11 (18.1)	43 (17)	
Femur	57 (30.2)	9 (14.7)	66 (26)	
Tibia /Fibula	79 (41.8)	32 (52.5)	111 (45)	
Total	189 (100)	61 (100)	250 (100)	

The prevalence of analgesics administration before admission was 40.4% (101) and 46% (115) after admission to the ED. The most commonly used analgesic was diclofenac sodium, which was given intramuscularly at a dose of 75mg once. No combination of analgesic was used to control pain. There was no patient who was given opioids (pethedine/ morphine).

Table 2: Number of patients given or not given analgesics before and after admission

Analgesic	Before				After			
	Male	Female	Total	P-value	Male	Female	Total	P-value
Given	73 (38.6)	28 (45.9)	101 (40.4)	0.314	91 (48.1)	24(39.3)	115 (46.0)	0.230
Not given	116 (61.4)	33 (54.1)	149 (59.6)		96(51.9)	37 (60.7)	135 (54.0)	
Total	189 (100)	61 (100)	250 (100.0)		189 (100)	61(100)	250 (100)	

Other method used to control pain was splinting of the fractured limb. Ninety-three ((37.2%) patients were splinted before admission and 68.8% (N=172) after admission to the ED. The rate of analgesics administration or splinting before admission and after admission to the ED did not differ between sex ($P=0.314$ versus $P=0.230$) and ($P=0.314$ versus $P= 0.114$), respectively. Between 20 and 60 minutes was the most common waiting time before administration of analgesics (Figure 1).

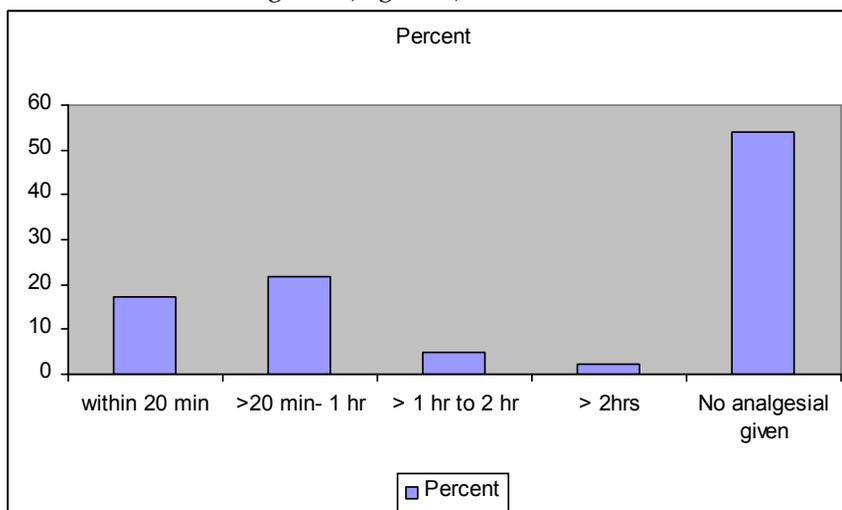


Figure 1: Proportion of patients and time spent before administration of analgesic

A total of 156 (62.4%) patients scored their pain as severe and among these, only 28 patients received analgesia within 20 min of admission. Forty-two patients received analgesia between 20 min and 1 hour after admission while 73 patients were not given analgesic despite scoring severe pain. It was observed that there were no recording of pain assessment before analgesic administration or pain re-evaluation after the administration of analgesic. Pain score before analgesic and the time waited from admission to the administration of analgesia is summarised in Table 3.

Table 3: Pain score before analgesia and time waited to receive analgesia

Waiting time	Worse, N (%)	Severe, N (%)	Moderate, N (%)	Mild, N (%)	Total, N (%)
Within 20 min	2 (40.0)	28 (17.9)	13(15.1)	0 (0.0)	43(17.2)
>20 min- 1 hr	1(20.0)	42 (26.9)	10(11.6)	1(33.3)	54 (21.6)
> 1 hr to 2 hr	-	7 (4.50)	5 (5.80)	-	12 (4.80)
> 2hrs	-	6 (3.80)	-	-	6 (2.40)
No analgesia given	2 (40)	73 (46.8)	58(67.4)	2 (66.7)	135 (54)
Total	5	156	86	3	250

After analgesics, 19% (22/115) of those who received analgesics continued to rate their pain as severe, 57% (66/115) as moderate, 23% (27/115) as mild and only one reported no pain. Furthermore, 79% (198/250) of patients were given analgesic prescription after being discharged from the ED while 20% (52/250) were not given prescription for analgesia. A large proportion, 72% (80/111) of patients with comminuted fractures scored severe pain. This was followed by spiral fracture 65.0% (13/20). The type of fracture was not found to significantly influence the pain score before analgesics in this study ($P=0.230$) (Table 4).

Table 4: Distribution of type of fracture by pain score

Type of fracture	Pain rate after analgesia				Total
	Worse	Severe	Moderate	Mild	
Transverse	1 (2.4)	24 (57.1)	17 (40.5)	0	42
Oblique	2 (2.6)	39 (50.6)	35 (45.5)	1 (1.3)	77
Spiral	0	13 (65.0)	7 (35.0)	0	20
Comminuted	2 (1.8)	80 (72.1)	27 (24.3)	2 (1.8)	111
Total	5 (2.0)	156 (62.4)	86 (34.4)	3 (1.2)	250

Discussion

The commonest long bone fracture for both male and female observed in this study was tibia and fibula. These results are different from those reported by Jones *et al.* (1996) that radius and ulna are the commonest long bone fractures (Jones *et al.*, 1996). The study shows that, there is no difference between male and female in the experience of pain following fracture. Similar findings have been reported elsewhere (Vaisto *et al.*, 2005; Salfar *et al.*, 2006). However, in a previous study by Raftery *et al.* (1995) it was observed that female patients reported more pain and were perceived by providers to have more pain than male patients. Like in our study, other authors have reported that there is no correlation between the type of fracture and severity of pain (Vaisto *et al.*, 2005). In other studies across the USA and

Canada, more women than men were reported to receive analgesia at EDs. In our current study there was an equal administration of analgesics between males and females.

Although patient satisfaction was not measured in this study, it was found that patients were experiencing pain before and after their treatment. Presumably the opportunity to provide analgesia existed and was missed in most cases. When analgesics were used, there were no prescriptions for opioids, although these were available in the hospital. Similarly in a study in Paraguay no patient in the adult group received an opioid analgesic to relieve pains (Ducharme, 2000) while a third of the fracture patients did not receive any pain medications in a study in the USA (Brown *et al.*, 2003). It has been reported that many doctors are reluctant to prescribe opioid analgesics while nursing staff are often hesitant to administer them for fear of side-effects (Pasero & McCaffery, 1997). While in our study, diclofenac was the most commonly prescribed analgesic, meperidine morphine, hydrocodone and codeine have been reported to be the most commonly used analgesics among adult patients in the USA (Jones *et al.*, 1996). In this study it was observed that, the type of analgesia, dosage given and frequency of administration was not sufficient to relieve pain. Similar findings have been reported elsewhere (Tamayo-Sarver *et al.*, 2005; Motov & Khan, 2009). The time of administration of analgesics in this study was shorter compared to other studies conducted in Israel (Todd *et al.*, 1994) and in Rwanda (Rampanjato *et al.*, 2007).

This study observed that there was no documentation of pain assessment before administration of analgesia and re-evaluation thereafter. In a study conducted in the USA pain scores were recorded in 59% of the patients (Jones *et al.*, 1996). However when pain scores were recorded as moderate or severe, analgesic was not routinely used. In another study in Canada it was observed that, for patients with documented moderate to severe pain received analgesia (Brown *et al.*, 2003). In another study patients with different pain levels were likely to receive any type of analgesic in the early and late periods. However, patients who rated their pain as mild or moderate were much more unlikely to receive any analgesic (Shah & Lendrum, 2002). There was no uniform method of documenting the intensity of pain and re-assessment of pain relief (Shah & Lendrum, 2002) as observed in our current study.

In conclusion, the great responsibility of health provider at ED is to relieve pain by all possible appropriate means in a timely, efficient and effective manner. Pain should therefore, be assessed, reassessed and recorded as a fifth vital sign and appropriate management should be instituted as indicated by standard guidelines.

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