A Retrospective Study of Drugs Prescribed During Conservative Management of Isolated closed Fracture of Upper Limb in a Tertiary care Hospital

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ABSTRACT

Background: Fractures are common presentation in the emergency department. Patient related factors and site of fracture play an important role in planning the management of fracture pain. This study was done to assess drugs prescribed during conservative management of closed isolated upper limb fractures. **Methods:** A retrospective study was conducted. The case records of patients who visited the tertiary care hospital with closed isolated fracture of upper limb following trauma and were managed conservatively was analysed. The results were expressed as percentage. **Results:** Out of the 100 patients, 79 were adults and 21 children. Pain score was recorded in 83% of the patients. All patients received analgesics. The commonly prescribed oral analgesic in children and adults were ibuprofen (85.71%) and aceclofenac (60.75%), respectively. The commonly used opioid was tramadol, orally as well as parenterally, in both adults and children. Analgesic combinations accounted for 62.8% of the total analgesics prescribed. Propofol-fentanyl was commonly used during fracture reduction. **Conclusion:** Initial assessment of pain contributes to adequate management of acute pain. Use of analgesics and early reduction significantly reduce pain and improve outcome.

Key words: Fractures, Pain, Analgesics, Opioids, Sedation.

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INTRODUCTION

Fractures are among the most painful emergencies.[1] Fracture reduction procedures cause considerable patient discomfort.[2] Effective management of fracture pain and anxiety reduces patient distress and allows successful management of the fracture.[1] Patient related factors and site of fracture play an important role in planning the management of fracture pain.[2]

Adequate analgesia is required during acute management of fractures and dislocations. This will reduce patient's pain and anxiety and increases the chance of effective management of the fracture. Studies have reported that pain medications are frequently not part of the emergency treatment of fractures even with moderate pain in pediatric and adult patients. Pediatric patients were less likely to receive analgesics, especially opioids. Pain scores are often not recorded.[3-11] A single regimen may

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not provide adequate analgesia for all patients.[12] Various options available for pain management include opioids, nonsteroidal anti-inflammatory drugs, nerve block, epidural injections and muscle relaxants.[12] Alternatively, agents like propofol, ketamine, fentanyl may be used to manage distress associated with fracture reduction.[13] Physician's judgement along with the need of the patient influences selection of option to decrease pain and anxiety during conservative management of fractures. The aim of this study was to assess drugs prescribed during conservative management of closed isolated upper limb fractures in a tertiary care hospital

MATERIALS AND METHODS

A retrospective study was conducted in the medical records section of a tertiary care hospital. The case records of patients who visited orthopaedics outpatient department/ casualty of a tertiary care hospital over a period of six months with closed fracture of upper limb and met the selection criteria was analysed.

Subject selection

Inclusion criteria

Adults and children of either sex with closed isolated fracture in upper limb due to trauma and managed conservatively.

Exclusion criteria

Patients with closed fracture in upper extremity due to other causes or those who required operative management or clavicular fractures.

The data collected from the medical records included patient demographics, fracture site, pain score, drugs prescribed, number of drugs prescribed by generic name, adverse reactions, if any, to the drugs used.

Data was analysed and results were expressed in percentage.

RESULTS

A total of 100 patients met the inclusion criteria. Out of these, 79 were adults while 21 were children. Among adults, 55.69% were males and 44.31% were females. Males constituted 71.42% of children. The mean age of adults was 47.88 ± 19.86y. About 26.58% of adults were above 60 y of age. The mean age of children was 10.77 ± 3.98 y. Fracture of radius was common (55%) followed by humerus (43%). The common site of fracture was at lower end of radius (83.63%) followed by proximal humerus (30.23%).

Pain score was recorded in 83% cases. Visual analog scale was used in adults and pictorial chart for children. The mean pain score was 2.55 ± 1.21 in adults and 2.61 ± 1.29 in children. A majority of patients had pain score of 2(33.73%) or 3 (24.09%). About 18 patients (21.68%) had a pain score of 4 or 5.

The total number of oral analgesics used was 97. Non-steroidal anti-inflammatory drugs (NSAIDs) were more commonly used than opioids. Of the oral analgesics, overall the most commonly used drug was aceclofenac. Aceclofenac was used in 52% of patients, and in 53.61% of the prescriptions. Aceclofenac was followed by ibuprofen, either alone or as a combination (in 30% of cases, and in 30.93% of prescriptions, Figure 1). The next commonly used oral drug was tramadol, either alone or in combination (in 13.40% of prescriptions).

In adults, the most common oral analgesic prescribed was aceclofenac, alone or in combination (60.76% of cases, Table 1). Aceclofenac sustained release formulation was prescribed in 95.23% of adult patients. In children, ibuprofen, either alone or in combination, was prescribed

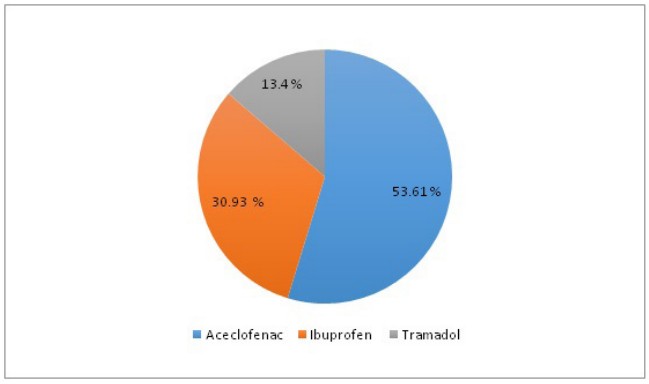

Figure 1: Percentage of Oral Analgesics (n=97)

Table 1: Analgesic prescribed to adults and children

Drug	Adults	Children
Aceclofenac	21	02
Aceclofenac+ paracetamol	24	02
Ibuprofen	-	12
Ibuprofen+paracetamol	15	05
*Tramadol(alone and in combination)	12	01
*Diclofenac (alone and in combination)	03	-

*combination with paracetamol.

the most (85.71% of cases). The opioids prescribed included tramadol and pentazocine. Tramadol was used alone or in combination with paracetamol.

Analgesic combinations formed 62.89% of the prescriptions analysed. Of the combinations, aceclofenac plus paracetamol was the most frequently prescribed combination (49.18% of the combination drugs). About 43% of the patients required additional injectable analgesic (single dose). Inj. diclofenac was used in 65.11% whereas tramadol was prescribed in 27.90% of these patients. Inj. pentazocine was the other opioid used.

Pantoprazole was prescribed along with NSAIDs in 93% of patients. All patients obtained pain relief following use of analgesics. No adverse effects were recorded in the case sheet. Generic names were not used when prescribing drugs.

Fracture reduction was done in 36 patients of which 55.55% were adults and remaining were children. About 13 (36.11%) of these patients received propofol as well as fentanyl; in addition, five of these patients were administered either vecuronium or atracurium. Pentazocine along with promethazine was prescribed in 7 (9.44%) patients who underwent reduction. Diazepam was used in three patients.

DISCUSSION

Pain is one of the most common symptoms of fracture and one of the most common reason for visit to emergency. Hence, assessment of pain severity and its effective management particularly on its acute presentation, is important. Adequate pain relief is alsonecessary for successful closed reduction of fractures.[14,15]

Males were predominant in our study. Fractures of radius was common in our study. This was similar to other studies where upper limb injuries were mainly fractures of the radius (79%) and ulna (29%) and there was male predominance.[16]

Pain score was recorded in a majority of patients in this study. An assessment and documentation of pain is the initial step to improve quality of treatment and outcome. [14] Simple pain scales can be used for pain assessment. Assessment of pain in all patients should be the standard practice in all health care settings.[17] Failure to pay attention and assess initial pain by the treating doctor is an important reason for poor management of acute pain.[14]

All patients, adults and children, received analgesics in our study despite pain score not being recorded in few of them. This is different from other studies wherein only 30% patients with acute bone fractures received analgesia. Previous studies have reported that children receive less analgesia than adults.[3-11] Another study showed that less than half of the children with acute pain due to limb fractures, were administered analgesics.[18,19] These findings are contrary to our results where all children obtained analgesics with or without sedation and attained pain relief. Safety of analgesics, specially opioids could influence prescribing of these drugs. This can lead to a decrease in pain medication use specially at the extremes of age.[3]

Early pain control in acute pain is recommended to alleviate distress.[14] Opioids have potent analgesic effect but are associated with various side effects. Adverse effects like sedation and respiratory depression with opioids are not seen with NSAIDs. This could be the reason for increased use of NSAIDs over opioids in our study. Almost all patients in this study received NSAIDs. Aceclofenac, a NSAID, was the commonly used analgesic in adults in our study. Sustained release formulation of aceclofenac was commonly prescribed. The advantage is prolonged duration of action resulting in decreased frequency of administration, hence improved patient compliance. A combination of analgesics was also prescribed in our study. It included a combination of two NSAIDs or an opioid with a NSAID. This results in an additive analgesic effect. The opioid used commonly was tramadol followed by pentazocine. In addition to NSAIDs, injectable form of opioids were administered once along with promethazine. This could have prevented nausea and vomiting associated with these drugs. Pantoprazole, a proton pump inhibitor, was prescribed along with NSAIDs to a majority of the patients to prevent gastric irritation and ulceration.

Ibuprofen was the commonly prescribed analgesic in children. This could be due to its efficacy and safety. Pierce et al published a meta-analysis of pain management in children which showed no significant difference between paracetamol and ibuprofen, while the others showed ibuprofen to be superior to paracetamol in children and equally safe.[20,21] In another study, there was no significant difference in effectiveness between morphine and ibuprofen.[22] But, adverse effects were significantly more with morphine. Hence, children were less likely than adults to have opioids prescribed.

Studies have shown the use of various agents during fracture reduction. They include pethidine alone, combination of pethidine and diazepam, tramadol, ketamine, propofol and

fentanyl. In this study, procedural sedation was done with propofol-fentanyl in most of the patients who underwent fracture reduction. Propofol-fentanyl decrease distress associated with painful orthopedic procedures. In addition, residual impairment is short lasting. Lower incidence of vomiting and smooth recovery are other advantages of propofol.[13] Benzodiazepines like diazepam was used in few patients–it causes sedation, has anxiolytic effect and is a centrally acting skeletal muscle relaxant. Pentazocine along with promethazine was also used. Pentazocine, an opioid, causes sedation and relieves pain. Promethazine has antiemetic and sedative effect.

The limitations of the study are the small sample size and short duration of the study. A comparison of use of drugs based on age and severity of pain could not be done. Coexisting morbidities were not recorded. Moreover, there was no record of whether patients received any analgesic prior to coming to hospital. Prior administration of analgesic could have affected the pain score.[3] Time required for relief of pain was not known. Adverse effects of drugs were not recorded.

CONCLUSION

Initial assessment of pain contributes to adequate management of acute pain. Use of analgesics and early reduction significantly reduce pain and improve outcome. A comparative assessment of drugs used along with the treatment outcome in children, young adults and elderly during conservative management of fractures of extremity will provide valuable information for effective use of drugs in various age groups.

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