

**ORIGINAL ARTICLE**

**Analgesic use in the intensive care unit of a tertiary teaching hospital**

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**ABSTRACT** **Background:** Moderate to severe pain is common in the intensive care unit (ICU). There are various sources of pain in the ICU ranging from trauma-related pain, acute post-operative pain, ICU procedure-related pains and pain from disease processes. We aim to determine the pattern of analgesic use and the extent of use of potent opioids in our ICU. **Methodology:** This was a retrospective audit of all ICU admissions during 12 months in a tertiary hospital in Northern Nigeria after an ethical waiver. Data on age, sex, indication for admission (medical/surgical) and types of analgesics were retrieved and analyzed using SPSS version 21. Continuous data were summarized as mean±standard deviations while qualitative data were summarized as proportions. Fisher’s Exact Test (FET) was computed. The level of significance was set at p≤0.05. **Results:** There were 98 admissions out of whom 94(95.9%) received analgesics. Females that were administered analgesics constituted 42(44.7%) of admitted patients. The mean age was 35.4±18.4years. Most of the admissions were surgical 86(91.5%). Paracetamol, diclofenac, pentazocine and tramadol were used in 20(21.3%), 15(16%), 54(57.4%), and 2(2.1%) patients while pethidine and morphine were administered in 1(1.1%) and 2(2.1%) patients respectively. There was no statistically significant relationship between the types of analgesics used and indication for admission (medical/surgical) p=0.422 (FET). **Conclusion:** Most of those treated during the period under review were postoperative surgical patients. Pentazocine was the most commonly used analgesic at that time and there was low utilization of potent opioids such as fentanyl and morphine.

**Keywords:** Analgesic, multimodal, opioid, pentazocine, postoperative pain

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**INTRODUCTION**

Moderate to severe pain is common in the ICU.<sup>[1]</sup> There are various sources of pain in the ICU ranging from trauma-related pain, acute post-operative pain, ICU procedure-related pains and pain from disease processes.<sup>[1],[2]</sup> Inadequate pain treatment has been linked to prolonged stay in the ICU, distress, depression, anxiety and insomnia.<sup>[3]</sup> Challenges to

adequate pain treatment in the ICU include the health practitioner’s attitude to pain, use of pain treatment protocols without evidence, inadequate method of assessment of pain and insufficient training of the practitioner concerning pain assessment and treatment.<sup>[4]</sup> It has been documented that less than 50% of practitioners assess pain before treating it.<sup>[5]</sup> Studies have also shown that pain is infrequently assessed and poorly managed in the ICU despite evidence of its

its negative impact.<sup>[6]</sup>

Self-reporting of pain is considered the gold standard.<sup>[7]</sup> Pain scales used in the ICU are useful in the assessment of pain and measurement of response to treatment. The Visual Analogue Scale (VAS), Numerical Rating Scale (NRS) or Verbal Rating Scale (VRS) are used for the patients that can talk.<sup>[8]</sup> In patients that cannot communicate the Behavioural Pain Scale (BPS) or Critical Care Pain Observation Tool (CPOT) can be used.<sup>[7], [9]</sup>

Systemic opioids and other components of multimodal analgesic techniques are being used to improve pain management in the ICU.<sup>[3]</sup> Techniques of pain management in the ICU developed by the American Society of Anesthesiologists include: Intermittent or continuous systemic opioids, multimodal techniques (the administration of 2 or more drugs that act by different mechanisms to provide analgesia), central neuraxial opioid analgesia and peripheral regional analgesic techniques including intercostal blocks, plexus blocks, and local anaesthetic infiltration.<sup>[3]</sup> Opioids are considered to be the standard for the treatment of acute pain in the ICU. Non-opioid analgesics such as Paracetamol (PCM) and non-steroidal anti-inflammatory drugs (NSAIDs) are used for mild to moderate pain.<sup>[8]</sup> The guidelines published by the Society of Critical Care Medicine in 2013 stated that proper pain management through routine assessment and monitoring of pain scale improves the prognosis of patients treated in the ICU with intravenous opioids recommended as first-line analgesics.<sup>[7]</sup>

We aim to determine the pattern of analgesic use and the extent of use of potent opioids in our ICU.

**Methodology**

This was a retrospective audit of all ICU admissions that occurred over 12 months in a tertiary hospital in Northern Nigeria following an ethical waiver. Data on age, sex, indication for admission (medical/surgical) and types of analgesics were retrieved and analyzed using SPSS version 21. Continuous data were summarized as mean standard deviations while qualitative data were summarized as proportions. Fisher’s Exact Test (FET) was computed. The level of significance was set at  $p \leq 0.05$ .

**Results**

There were 98 admissions out of whom 94(95.9%) received analgesics. Females who were administered analgesics constituted 42(44.7%) of admitted patients (Figure 1). The mean age was  $35.4 \pm 18.4$  years. Most of the admissions were surgical 86(91.5%) as shown in Table I. Paracetamol, diclofenac, pentazocine and tramadol were used in 20(21.3%), 15(16%), 54(57.4%), and 2(2.1%) patients while pethidine and

morphine were administered in 1(1.1%) and 2(2.1%) patients respectively (Figure 2). There was no statistically significant relationship between the types of analgesics used and indication for admission (medical/surgical)  $p=0.422$  (FET).

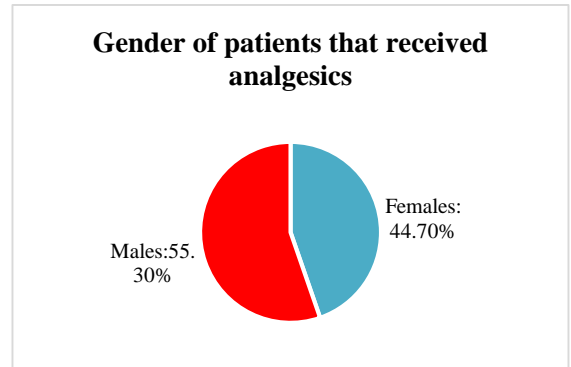


Figure 1

Table I: Distribution of ICU patients by specialty of admission

Specialty	Female	Male	Total
Cardio-thoracic Surgery	8(8.3)	17(17.4)	<b>25(25.7)</b>
Ear, Nose and Throat	2(2.0)	2(2.0)	<b>4(4.0)</b>
Paediatrics	-	1(1.0)	<b>1(1.0)</b>
Medicine	2(2.0)	4(4.1)	<b>6(6.1)</b>
Maxillofacial Surgery	2(2.0)	1(1.0)	<b>3(3.0)</b>
Nephrology	-	1(1.0)	<b>1(1.0)</b>
Neurology	1(1.0)	-	<b>1(1.0)</b>
Neurosurgery	2(2.0)	11(11.3)	<b>13(13.3)</b>
Obstetrics and Gynaecology	14(14.3)	-	<b>14(14.3)</b>
Orthopaedics	2(2.0)	2(2.0)	<b>4(4.0)</b>
Paediatric Surgery	2(2.0)	-	<b>2(2.0)</b>
Plastic Surgery	1(1.0)	1(1.0)	<b>2(2.0)</b>
General Surgery	8(8.3)	13(13.3)	<b>21(21.6)</b>
Urology	-	1(1.0)	<b>1(1.0)</b>
<b>Total</b>	<b>44(44.9)</b>	<b>54(55.1)</b>	<b>98(100.0)</b>

**Discussion**

This study found that most of those treated during the period under review were postoperative surgical patients. Pentazocine was the most used analgesic at that time and there was low utilization of potent opioids. Acute pain is common in the ICU and moderate to severe pain has been observed in nearly half of ICU patients.<sup>[1]</sup> The American Society of Anesthesiologists Task Force on Acute Pain Management has published a practice guideline for

acute pain management in the peri-operative setting. It reduce the risk of adverse outcomes, maintain functional abilities as well as physical and psychological well-being and improve the quality of life.<sup>[3]</sup>

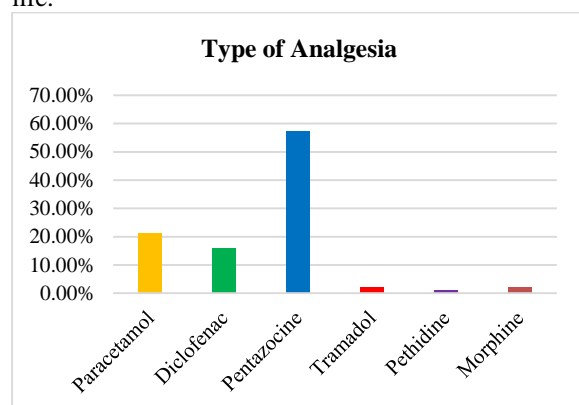


Figure 2

The choice of analgesics in our facility is based on the preference of the physician and the availability of medications which were used in combination in some instances. Most of the time—potent opioids such as morphine and fentanyl are not available and when in stock the health practitioners are not aware that it is available in the hospital pharmacy due to inadequate communication. In addition, the erratic supply of morphine and other potent opioid analgesics has made the use of Pentazocine to be popular. Pentazocine was the most commonly used analgesic and was used in 54(57.4%) of patients during the period of study. In Nigeria, there is a high level of prescription of Pentazocine because it is readily available and is used for the treatment of both medical and surgical pain. Pentazocine is a synthetic mixed agonist–antagonist narcotic (opioid analgesic) drug used to treat moderate to severe pain. The tolerance and dependence caused by Pentazocine is not as much as that of other strong opioids.<sup>[10]</sup> Tade *et al.*<sup>[11]</sup> in their prospective study using Pentazocine for pain relief in adult patients with acute abdominal pain reported that the administration of the drug provides adequate analgesia and significantly reduces discomfort.

Sadly, there have been reports of Pentazocine abuse in this environment.<sup>[12]</sup> Pentazocine and pethidine were not included in the current World Health Organisation (WHO) analgesic ladder because they tended to cause dependence and other side effects.<sup>[13],[14]</sup> In some parts of Nigeria Pentazocine can be purchased over the counter which makes it readily available to patients with the attendant risk of addiction and dependence in susceptible patients.<sup>[15]</sup> Madu *et al.*<sup>[16]</sup> reported a prevalence rate of 2.9% of addiction to Pentazocine in Nigeria. There is a need for strict regulation by the government so that the abuse of the drug can be checked.

Paracetamol was the second most commonly used analgesic in this study. It was used in 21.3% of patients. PCM is a selective COX-3 inhibitor and has a greater antipyretic than analgesic effect. The use of PCM avoids the side effects of opioids hence its popularity.<sup>[17]</sup> Ehikhamenor *et al.*<sup>[17]</sup> in their study on the evaluation of analgesics prescribing patterns in a tertiary hospital in Nigeria documented that paracetamol was the analgesic of choice at that time. The preference for PCM is because of factors such as a wide range of indications, good safety profile and can be administered orally or as an injection.<sup>[18],[19]</sup> Diclofenac was the third most commonly used analgesic during the period of audit. It was used for 15(16%) of patients in this study. It is a non-steroidal anti-inflammatory drug used for the treatment of mild to moderate acute postoperative or post-traumatic pain.<sup>[17]</sup> It is a non-selective COX inhibitor and it reduces moderate to severe pain caused by inflammation.<sup>[20]</sup> Kumarasingam *et al.*<sup>[21]</sup> in their study on drug utilization pattern of analgesics among postoperative patients in a tertiary care hospital found that diclofenac was the most frequently used non-opioid analgesic by intramuscular route. They went further to state that “the advantage of diclofenac usage for post-operative pain is that it can be administered parenterally in the initial post-operative period and be converted to enteral route later on the 2nd and 3rd post-operative day”. A similar study by Imranuddin *et al.*<sup>[22]</sup> also reported that diclofenac was the most prescribed analgesic in their study due to its lesser side effects and effectiveness compared to other analgesics. Tramadol was used in 2(2.1%) of patients during the period of study in our center. It is a centrally acting opioid analgesic used in treating moderate to severe pain and has lower risk of respiratory depression compared to morphine.<sup>[23]</sup> The study by Kumarasingam *et al.*<sup>[21]</sup> documented that the administration of tramadol reduced from the first postoperative day due to fear of addiction and other side effects.

The low utilization of potent opioids in our study was similar to the findings of Ehikhamenor *et al.*<sup>[17]</sup> as a result of concerns with side effects. Health practitioners are always concerned about the possibility of addiction to opioids and the associated side effects such as nausea, vomiting and respiratory depression.<sup>[24],[25]</sup>

This study was limited by the fact that it was a retrospective audit and we were not able to retrieve data on which analgesics were administered as a combination and whether intermittently or continuously. Again, there was no information on pain assessment, sedation and complications. There is a need for future prospective studies on multimodal analgesia.

## Conclusion

Most of those treated during the period under review were postoperative surgical patients. Pentazocine was the most commonly used analgesic at that time and there was low utilization of potent opioids such as fentanyl and morphine.

## Disclosure

Abstract was presented during the World Congress of Intensive Care in Melbourne, Australia and published in the book of abstracts in the journal, Australian Critical Care.

## References

1. Stanik-Hutt JA, Soeken KL, Belcher AE, Fontaine DK, Gift AG. Pain experiences of traumatically injured patients in a critical care setting. *Am J Crit Care*. 2001; 10(4):252-9.
2. Desbiens NA, Wu AW. Pain and suffering in seriously ill hospitalized patients. *J Am Geriatr Soc* 2000; 48(Suppl 5):S183-6.
3. Practice guidelines for acute pain management in the perioperative setting: an updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. *Anesthesiology*. 2012; 116(2):248-73.
4. Sakata RK. Analgesia and Sedation in Intensive Care Unit. *Rev Bras Anestesiol* 2010; 60(6): 648-658.
5. Riker RR, Fraser GL – Altering intensive care sedation paradigms to improve patient outcomes. *Crit Care Clin*, 2009; 25:527-538.
6. Payen JF, Chanques G, Mantz J, Hercule C, Auriant I, Leguillou JL, et al. Current practices in sedation and analgesia for mechanically ventilated critically ill patients: a prospective multicenter patient-based study. *Anesthesiology* 2007; 106: 687-95.
7. Barr J, Fraser GL, Puntillo K, Ely EW, Gelinas C, Dasta JF, et al. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. *Crit Care Med* 2013; 41: 263-306.
8. Narayanan M, Venkataraju A. Analgesia in intensive care: part 1. *BJA Education* 2016; 16(2): 72-78.
9. Payen J, Bru O, Bosson JL, Lagrasta A, Novel E, Deschaux I, et al. Assessing pain in critically ill sedated patients by using a behavioural pain scale. *Crit Care Med* 2001; 29: 2258-63.
10. King CD, Goodin B, Glover TL, Riley JL, Hou W, Staud R, Fillingim RB: Is the pain-reducing effect of opioid medication reliable? A psychophysical study of morphine and Pentazocine analgesia. *Pain* 2013; 154(3):476-83.
11. Tade AO, Salami BA, Ayoade AB. Pentazocine Pain Relief in Adult Patients with Acute Abdominal Pain. A Prospective Randomized Clinical Trial. *East Cent. Afr. J Surg*. 2009; 14(2): 44-49.
12. Makanjuola AB, Olatunji PO. Pentazocine abuse in sickle cell anemia patients. A report of two cases vignettes. *Afr J Drug Alcohol Stud* 2009; 8(2):59-64.
13. Reid MC, Henderson CR, Papaleontiou M, Amanfo L, Olkhovskaya Y, Moore AA, et al. Characteristics of older adults receiving opioids in primary care: treatment duration and outcomes. *Pain Med* 2010; 11(7): 1063-1071.
14. Trescot AM, Helm S, Hansen H, Benyamin R, Glaser SE, Adlaka R, et al. Opioids in the management of chronic non-cancer pain: an update of American Society of the Interventional Pain Physicians' (ASIPP) Guidelines. *Pain Physician* 2008; 11(2):5-62.
15. Iheanacho OE, Ezenwenyi IP, Enosolease ME. Pentazocine abuse in Sickle Cell Disease Patients seen at a tertiary hospital in Nigeria: a chronic menace. *Int J Trop Dis Health* 2015; 9(10): 1-8.
16. Madu AJ, Korubo K, Okoye H, Ugwu N, Efobi C, Nwogoh B, *et al*. Survey of pentazocine addiction and opioid use in adult sickle cell anaemia patients: The perspective of healthcare providers. *Haematol Int J* 2018; 2:000133.
17. Ehikhamenor EE, Aghahowa SE, Azodo CC. Retrospective evaluation of analgesics prescribing pattern in a tertiary hospital in Nigeria. *JMBR* 2012; 11(1):71-77.
18. Bannwarth B, Pehourcq F: Pharmacological rationale for the clinical use of paracetamol: pharmacokinetic and pharmacodynamic issues. *Drugs* 2003; 63: 2-5.
19. Day RO, Graham GG, Whelton A: The position of paracetamol in the world of analgesics. *Am J Ther* 2000; 7:51-54.
20. Dashputra AV, Badwaik RT. Utilization of analgesics in perioperative cases of teaching hospital. *Int J Med Pharm Sci* 2013; 3(6):14-19.
21. Kumarasingham T, Revathy S, Mukherjee. Drug utilization pattern of analgesics among postoperative patients in a tertiary care hospital. *Der Pharmacia Lettre* 2014; 6(3)40-46.
22. Imranuddin M, Lakshmi BV, Kameswari G. Prescribing patterns of analgesics in a tertiary care teaching hospital in Rangareddy Dist Telangana. *IAJPS* 2016; 3(8): 804-808.
23. Macintyre PE, Schug SA, Scott DA. Acute pain management: the evidence grows. *MJA* 2006; 184 (3):101-102.
24. Sinatra RS, Jahr JS, Reynolds LW, Viscusi ER, Groudine SB, Payen-Champenois C. Efficacy and safety of single and repeated administration of 1 gram intravenous acetaminophen injection (paracetamol) for pain management after major orthopedic surgery. *Anesthesiology*. 2005; 102(4):822-31.
25. Ali A. Chohan U, Atiq F. Intravenous tramadol vs ketorolac in laparoscopic dye test. *J Coll Physicians Surg Pak*. 2006; 16(1):3-6.