

ICU and Analgesia: Basics and Importance of Analgesics in ICU

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Abstract

Most of the patients admitted in ICU complain of pain at one time or another. Though a few patients are able to communicate their pain, a considerable portion fails to communicate the pain. As a result considerable number of patients receive severely underwhelmed analgesia. Poor quality analgesia adds on to the already present comorbidities leading to adverse outcomes. Hence it is important to identify the pain and then adequately manage it, which has been discussed here, concisely.

Keywords: Intensive Care Unit; Pain; Analgesia; Opioids; Regional Anaesthesia

Abbreviations

ICU: Intensive Care Unit: ICU

"Inability to express the pain is more painful than the pain itself".

Anonymous

Intensive Care Unit(ICU) being the integral part of any hospital, receive patients of all kind, ranging from patients admitted due to medical ailments to post-surgical patients not excluding the patients in need of palliative care. Most of the patients admitted in ICU complain of pain at one time or another [1]. Hence, pain management in ICU patients is of utmost importance. Pain in ICU patients may be part of the disease process itself, e.g. neuropathic pain in Guillain Barre Syndrome, surgical incision in postoperative patients, injuries due to trauma or may be caused by routine ICU care(tracheal suctioning, positioning, physiotherapy), and various procedures in ICU e.g. central line insertion, endotracheal intubation [2]. Uncontrolled pain is associated with physiological stress response which leads to altered metabolic, immunological, haematological and behavioural activities [3].

Pain in hospitalised patient remains severely undertreated and that too specifically in the patients admitted to ICU, mostly due to inability of the patients to express their discomfort. So, recognition of pain in an ICU is of paramount importance. Though self-reporting of pain is considered as gold standard, but it is not always feasible in a patient admitted in ICU, so physicians have to rely on various pain scales. Visual analogue scale, Numerical rating scale and Verbal rating scale are few such scales which are useful in patients who can communicate. For others, who fail to communicate their pain, critical care pain observation tool and behaviour pain scale can be used [4,5].

Adequate pain management in ICU patients is associated with overall better outcomes. There is lower requirement of sedation leading to decreased number of average ventilator days, early mobilization decreased morbidity and mortality.

Pain management in ICU should be individualised depending on the patient’s needs. Ideally, a multimodal approach including systemic analgesia along with regional analgesia should be used if possible. Opioids are considered the mainstay of every analgesic therapy but they should be combined with various non-opioids and adjuvant drugs to decrease the systemic side effects while covering the different pathways of controlling pain.

Opioids act on various opioid receptor in central nervous system and peripheral tissues. Drugs such as fentanyl and remifentanyl are preferred over longer acting drugs like morphine, as they have shorter context sensitive half-lives, leading to better titration and also better assessment of patients on ventilator when sedation is hold(though remifentanyl is associated with opioid induced hyperalgesia after sudden cessation, when used for longer terms).

Non-opioid analgesics like paracetamol and Non-steroidal anti-inflammatory drugs (NSAIDs) are effective for mild to moderate pain. Though paracetamol can be safely used in usual doses in most of the patients except a few on the verge of liver failure, but use of NSAIDs is associated with severe side effects such as renal dysfunction and severe gastrointestinal bleeding, which preclude their routine use in ICU.

Nociceptive pain is managed well with these drugs, but neuropathic pain can be refractory to them and hence use of adjunctive drugs has increased recently. Neuropathic pain is best managed with gabapentinoids (gabapentin and pregabalin) and tricyclic antidepressants (Amitriptyline) [6]. But their use is restricted in ICU, as these are mainly available as enteral formulations.

Analgesic adjuvants are also of benefit in patient with opioid tolerance and withdrawal and help in opioid rotation in such patients. Drugs such as dexmedetomidine, clonidine (both are alpha 2 agonist) and ketamine (NMDA receptor antagonist) may be of help in such cases. But use of dexmedetomidine and clonidine is complicated by severe bradycardia and hypotension, more so with dexmedetomidine. Also, sudden cessation after prolonged infusion may be associated with rebound hypertension.

Regional analgesia may be of help in reducing the systemic side effects of analgesic drugs, when used judiciously. Regional anaesthesia should be administered based on patients requirements, it may include neuraxial blockade, truncal blocks, intercostal and interpleural blocks, and various upper and lower limb blocks. Though regional anaesthesia provide excellent analgesia but their use is controversial in patients with coagulopathy, sepsis, haemodynamic instability and severe organ (hepatic, renal and cardiac) dysfunction, which significantly alter the pharmacokinetics and pharmacodynamics of the local anaesthetics. Furthermore, use of regional anaesthesia has its own side effects and complications like, local anaesthesia systemic toxicity, epidural abscess (neuraxial block), diaphragmatic paresis (inter-scalene nerve block) and inability to early identify compartment syndrome(in case of limb blocks), which if occurs leads to considerable increase of both morbidity and mortality [7,8].

Alternative therapies like transcutaneous electrical nerve stimulation, acupuncture and music therapy may also be added to the management as they have low side effect profile.

In conclusion, pain, though being a common problem, is severely undermanaged in ICU, leading to increased physiological stress response and hence, increased ICU stay and mortality. This can be improved by providing individualized treatment while considering the patients physiology and drugs pharmacology.

Drug	Dosage(intravenous)
Fentanyl	Bolus: 1 - 2 µg/kg Infusion: 1 - 10 µg/kg/hr
Remifentanyl	Bolus: 1 µg/kg Infusion: 0.05 - 2 µg/kg/min
Paracetamol	10 - 15 mg/kg 6 - 8 hourly
Dexmedetomidine	Bolus: 1 µg/kg Infusion: 0.02 - 1 µg/kg/hr

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Conflict of Interest

Nil.

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