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Ketamine for Post-Operative Analgesia in Paediatrics

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Abstract

Statement of the problem: Study of ketamine postoperative for pediatrics as analgesics in kids group to achieve good analgesia, decrease opioid consumption postoperative. Target patients in case study are Pediatrics above 1-year age (6 months to 6 years of age).

Methodology and theoretical orientation: Give Ketamine 1-2 mg/kg IM postoperative in 42 pediatric cases then assess patient comfort and pain severity in recovery room for 30 min postoperative up to 12 hours in ward.

Achieve good smooth painless recovery and decreasing opioid consumption, arousable responding to commands child with maintained spontaneous breathing causing analgesia up to 12 hours postoperative in 30 of 42 cases. The remaining 12 needed postoperative analgesics after 6 hours.

Conclusion and significance: Give ketamine 1 mg/kg IM after finishing surgery before extubation; esp. if other analgesics failed to relieve pain with full close observation and vital signs monitoring of child in recovery room for 30 min postoperative then assess child pain, vitals and conscious level before shifting to ward.

Keywords: Paediatrics; Analgesia; Surgery

Postoperative pain is one of the most undesirable experiences for a patient undergoing surgery. Deliberate action should be taken to prophylactically treat the pain. If postoperative pain does develop, it should be managed early and aggressively, because severe pain not only induces a delay in discharge and poorer patient satisfaction, but also can create a hyperalgesic condition known as persistent postoperative pain (PPP) [2-4]. This strains not only the patient, but also the healthcare system as a whole. Recent studies show that PPP has an incidence as high as 40%. Furthermore, 18.3% of patients report that this pain is moderate to severe [1]. Therefore, it is in the anesthesiologist's best interest to be aware of the severity of this problem and of all the pharmacological agents used to prevent and treat postoperative pain. To date, the mainstay of treatment has been the administration of exogenous opioids such as morphine or fentanyl [5].

Many therapeutic modalities as non-steroidal anti-inflammatory agents (NSAIDs), systemic opioids and local anesthetics have been used in children as effective means for post tonsillectomy pain control. Recent results of several studies in children using ketamine preemptively as an analgesic adjuvant have shown the effects of sub-analgesic doses of ketamine on postoperative pain and opioid consumption [6-9].

Organic chemistry

Phencyclidine derivative, Ketamine is an intravenous anesthetic, which is a noncompetitive antagonist of N-methyl-D-aspartate (NMDA) receptors [10].

Ketamine is racemic, has two stereoisomers: R- and S+, have different anesthetic potencies (1:3-4) but similar kinetics. Its R- and S+ stereoisomer have different binding affinities. (S)-Ketamine has about four times greater affinity for the PCP site of the NMDA receptor than (R)-Ketamine (in guinea pig brain). The S form also seems to be better at inducing the drowsiness than the R form. Ketamine is highly lipid soluble and soluble in aqueous solutions, therefore it does not require a lipid solvent like propofol or etomidate [11-14].

Introduction

More than 40 years ago during the Vietnam War, ketamine, a non-barbiturate phencyclidine derivative, was considered an ideal "battlefield anesthetic" because it does not alter hemodynamics and has sedative, hypnotic, analgesic, and amnestic properties. Recent reports suggest that with lower doses, ketamine may not be associated with untoward effects and may reduce perioperative pain, prevent opioid-induced hyperalgesia, decrease inflammation, reduce bronchoconstriction and improve the quality of life in a palliative care setting [1].

Methods

A prospective, randomized clinical trial** case study

- Target patients in case study are pediatrics above 1-year age (6 months to 6 years of age).
- Give Ketamine 1-2 mg/kg IM postoperative in 42 pediatric cases then assess patient comfort.
- And pain severity in recovery room for 30 min postoperative up to 24 hours in ward.
- Target/ Goals.
- Achieve good smooth painless recovery and decreasing opioid consumption.
- Child arousable responding to commands with maintained spontaneous breathing.
- Causing analgesia up to 12-24 hours post-operative.

Discussion

Research study is a prospective, randomized clinical trial** case study. Target patients in the case study are Pediatrics above 1-year age (6 months to 6 years of age). To give Ketamine 1-2 mg/kg IM postoperative in 42 pediatric cases then assess patient comfort and pain severity in recovery room for 30 min postoperative up to 24 hours in ward [15].

The pain score reported by the physician during first 4 hours and need for analgesics during 24 hours postoperatively was significantly decreased in the ketamine group versus control. In addition, there was no significant difference between ketamine and control groups for adverse effects during 24 hours postoperatively. Sensitivity analyses were performed to evaluate whether the pooled estimates of postoperative pain, postoperative analgesic requirements, time to first analgesic administration, time to first oral uptake, and adverse effect were different by omitting a different study each time and repeating the meta-analyses. Finally, the results were all consistent with the above outcomes [16].

Outcomes analyzed were postoperative pain (pain scores after leaving the operation room), postoperative (24 hours) analgesic requirements (either doses or percentage of patient receiving postoperative opioids or non-opioids analgesics), time to first analgesic administration (opioid or non-opioid analgesics administered with a defined pain intensity target). The influence of the administered ketamine on pain and sedation was separately analyzed through a grading scale after leaving the operation room. The evaluation was usually reported by the physician, with the smallest number being reported as no complaint or alert state, and the greatest number being reported as the severe complaint imaginable or asleep with no response to physical stimuli [17].

Conclusion

- Give ketamine 1 mg/kg IM after finishing surgery before extubation; esp. if other analgesics failed to relieve pain.
- Full close observation, vital signs monitoring of child in RR for 30 min post.

- Assess child pain, vital signs and conscious level before shifting to ward.
- Continuous monitoring, follow up of pain level in ward up to 24 hours postoperative.

Conflict of Interests

The authors declare no competing financial interests.

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