

To Compare the Efficacy of Ketorolac and Pethidine for Postoperative Pain Relief in First 24 Hours after Tonsillectomy

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ABSTRACT

Objectives: To compare the efficacy of Ketorolac and Pethidine for postoperative pain relief in first 24 hours after tonsillectomy.

Patients & methods: This comparative study was conducted at Anaesthesia Department PGMI Hayatabad Medical Complex, Peshawar between December, 2004 to May 2005. One hundred patients age 5-12 years under going tonsillectomy were divided into group A and B randomly, who received either Inj. Ketorolac 0.5mg/kg or inj. Pethidine 1mg/kg I/M respectively postoperatively on 6 hourly bases. Patients were assessed in recovery room and ENT ward for pain according to Faces Pain Scale and for any side effects. Amount of rescue Analgesia required by both groups were also recorded.

Results: The faces pain scale score showed both the drugs to be equally effective in pain relief with no significant difference. However, significantly decreased incidence of nausea, vomiting and sedation was found in Ketorolac group.

Conclusion: Ketorolac provides similar analgesic effects as pethidine in the doses mentioned above with much less incidence of nausea vomiting and drowsiness in first 24 hours after tonsillectomy.

Key words: Postoperative analgesia, children, Ketorolac, Pethidine, Tonsillectomy

INTRODUCTION

Pain following tonsillectomy in children is a significant problem that tends to be underestimated¹. Pain as defined by International Association for the study of pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage".² Pain induces metabolic, hormonal and respiratory response which has a negative impact on morbidity and mortality³. Traditionally pain in children is a topic that has received only minimal attention. Postoperative pain management particularly for children has undergone radical change during the past decade. Effective relief reduces the period of recovery, lowers overall in hospital costs and improves patient outcome⁴⁻⁶. Opioids are widely used analgesics for postoperative pain but many clinicians are reluctant to administer appropriate doses to children because of fear of serious adverse effects such as respiratory depression, sedation, protracted vomiting and ileus. Ketorolac tromethamine is a NSAID with potent analgesic and low incidence of side effects. Ketorolac does not depress ventilation and is not associated with nausea, vomiting, urinary retention, sedation, itching and reduces post operative opiate requirements^{7,8}.

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MATERIALS AND METHODS

This comparative study was done in ENT and Anaesthesia Departments PGMI, Hyatabad Medical Centre Peshawar from December 2004 to May 2005. It comprised 100 patients, aged 5-12 years admitted for tonsillectomy alone with ASA physical status I and II while those undergoing simultaneous procedures that is myringotomy adenoidectomy etc. and having epigastric pain, asthma, and renal disease were excluded. The patients were divided in two groups group A and group B. Group A was given Inj. Ketorolac and group B was given Inj. Pethidine. Pre operative investigation included HB%, TLC, DLC, bleeding time, clotting time, HBS Ag and HCV. No preoperative sedation was given. Also no peri-operative analgesia was given. Anaesthesia was induced with thiopentone 4-5mg/kg and was maintained with halothane 0.5% and 60% N2O in Oxygen. Tonsillectomy was done by the same technique. Neuromuscular block was antagonized subsequently with neostigmine .04-.08 mg/kg and Atropine 0.02mg/kg. In recovery room, group A received Inj. Ketorolac 0.5mg/kg diluted in 2ml and given intraglutealy and group B received Inj. Pethidine 1mg/kg diluted to a volume of 2ml intraglutealy. The drugs were given on 6 hourly bases postoperatively for 24 hours. Postoperative requirement for analgesia was based on a faces pain sale, a diagrammatic representation of pain intensity. Faces pain rating scale was done on 6 hourly bases. It is a series of faces, with 0 representing no pain, 1-2 representing mild pain, 3-4 representing moderate

pain and 5 representing severe pain. Rescue doses of Inj Pethidine 0.5 mg/kg were given if needed, intramuscularly. Data were analyzed statistically by T test and Chi square test. P<0.05 was considered significant.

RESULTS

There was statistically significant difference in postoperative respiratory rate. There was 20% drop in respiratory rate in Group B. Two patients (4%) had an episode of fall in oxygen saturation to less than 90%. All these patients required supplementary oxygen therapy. Incidence of nausea, vomiting and need of antiemetics was significantly high in group B (Table 1). Need for rescue analgesia rather than the mean pain score used for statistical analysis of two treatment groups there was no differences in patients' assessment of his post-operative pain in the two groups. The number of patient requiring rescue analgesia was the same in both the groups of which show that both drugs are equally good analgesics (Table 2). Postoperative sedation was significantly more in groups B (Table 3).

Table 1: Postoperative values (mean±SD or range)

Parameters	Group-A	Group-B
Heart rate	102±8.6	120±7.94
Blood pressure (mean Arterial Pressure)	77±3.87	76±4.42
Respiratory rate	20±2.8	16±1.83
Nausea	3(6%)	16(32%)
Vomiting	3(6%)	10(20%)
Anti emetic required	3(6%)	10 (20%)
Oxygen saturation (SPO ₂)	95–98%	88–98%
Oxygen therapy	0	2(4%)
No of patients requiring Rescue analgesia	05	05

Table 2: Postop pain score (Faces Pain Scale) at 06 hourly interval (mean and range)

Postoperative period	Group A	Group B
1 Hours	2.26 (2 – 3)	2.16 (2-3)
06 Hours	1.48 (1-3)	1.52 (1-3)
12 Hours	1.24 (1-3)	1.28 (1-3)
18 Hours	1.36 (1-2)	1.4 (1-2)

Table 3: Postop sedation assessment at 06 hourly intervals (mean and range)

Postoperative period	Group A	Group B
1 Hours	1 (0-2)	2 (1-3)
06 Hours	0	2 (1-3)
12 Hours	0	2 (1-3)
18 Hours	0	2 (1-3)
24 Hours	0	2 (1-3)

DISCUSSION

Despite research efforts post-tonsillectomy pain control in children remains a clinical dilemma.

Currently analgesics of choice are opioid derivatives, such as morphine and pethidine etc but risks such as potential overdose with narcosis and respiratory depression make them less than ideal. Postoperative use of non-steroidal anti-inflammatory drugs such as ibuprofen, Ketorolac and Ketoprofen etc can improve analgesia. In this study we have compared two strong analgesics from different groups for postoperative analgesia and their side effects after tonsillectomy in children. It is very encouraging to note that faces pain scale score in both the groups was about equal and number of patients requiring rescue analgesia, was same in both the groups, which confirms that analgesic quality of Ketorolac comparable to that of Pethidine in the doses mentioned above.

According to the study done by Desperate in 1993 ketorolac 0.9 mg/kg was been shown to be equally effective as fentanyl 2mg/kg in relieving post –tonsillectomy pain but reduced the incidence of nausea and vomiting by more than 30%,⁹ Gallagher in 1995 also reported a retrospective study in 226 children who had undergone tonsillectomy and had received either ketorolac 0.5mg/kg or miscellaneous opioid medications¹⁰. Pain relief was superior after ketorolac and side effects were less common. Bean-Lijewski and Hunt reported that intramuscular ketorolac 0.5 mg/ kg was as effective as pethidine 1.0 mp/ Kg¹¹. In Modern practice, post operative sedation is not a desirable feature after general anaesthetic. In the developed countries, only those anaesthetic, analgesics or muscle relaxants are used which have shortest and predictable duration of action and are without any residual effect or active metabolites. We have found that post operatively, patients in group A were awake and Patients in group B had a significant level of sedation (Table 3)

Opioids are very strong and potent analgesic, but severe respiratory depression is a complication with opioids administered for post operative analgesia. The measurement of respiratory depression is often difficult. Respiratory rate measurement is easy to perform but it has been shown to be a relatively poor indicator by itself. In a study only half of the narcotic overdose patients had a respiratory rate below 8 breaths per minute, but all overdose patients had a decrease in mental status.¹³ Continuous pulse oximetry is a more sensitive method than respiratory rate alone but easily produce false alarm, annoying the patient.¹³ In our study we used both the methods to assess respiratory depression. There was 20% drop in respiratory rate in pethidine group. 4% of the patients receiving pethidine developed oxygen desaturation i.e., spo₂ <90% and needed supplementary oxygen. Due to potential danger of hypoxia there is general tendency to avoid or under

dose narcotic analgesic, which may be an injustice on our part. This concern may well be justified, since opioid readily cross the blood brain barrier in neonates and increase the risk of central nervous system depression at blood level that may be less than the minimum effective analgesic concentration (MEAC)¹⁴. Nausea and vomiting are very uncomfortable and distressing to the patients and these should be avoided particularly in pediatrics as there is danger of dehydration. Incidence of vomiting was 3 times more in group B receiving pethidine and incidence of nausea was 5 times more in group B.

To avoid the dose related side effects of narcotics, use of NSAIDS has become popular for mild to moderate post operative pain. Ketorolac is also a non steroidal anti inflammatory drug, which has been compared and found effective with pethidine 50-100 mg.¹⁵ The most important possible adverse effects induced by NSAIDS are renal insufficiency and postoperative bleeding during short term, postoperative use. A recent meta-analysis showed that NSAIDS cause a clinically unimportant reduction in renal function on the first day after surgery in patients with normal preoperative renal function.¹⁶ In a study with 11245 patients reported by Forrest et al in 2002 the incidence of acute renal failure was 0.1% after administration of ketorolac, diclofenac or ketoprofen for post operative pain relief.¹⁷ In our study no signs of renal insufficiency were noted. Post operative measured blood loss was also similar between the patients receiving ketorolac or pethidine.

CONCLUSION

Analgesic properties of Ketorolac are similar to pethidine but with much less incidence of nausea vomiting and drowsiness in first 24 hours after tonsillectomy. So it proved to be superior in postoperative pain control after tonsillectomy.

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