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Assessment of Perioperative Effect of oral Ketorolac and Acetaminophen in Children Undergoing Bilateral Myringotomy

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ABSTRACT

Background: To assess perioperative effect of oral ketorolac and acetaminophen in children undergoing bilateral myringotomy (BMT).

Methods: Seventy five paediatric patients of ASA physical status I or II scheduled to undergo elective bilateral myringotomy (BMT) of both genders were divided into three groups of 25 each. Group I received saline (placebo), Group II acetaminophen (10 mg/kg) and Group III ketorolac (1 mg/kg). No other preanaesthetic medications were administered.

Results: Group I had 15 males and 10 females, Group II had 12 males and 13 females and Group III had 11 males and 14 females. Duration of surgery was 8.4 minutes in Group I, 8.0 minutes in Group II and 7.4 minutes in group III. Duration of anaesthesia was 14.7 minutes in Group I, 14.3 minutes in Group II and 13.9 minutes in Group III. Oxygen saturation on arrival in PACU was 96.4% in Group I, 96.3% in Group II and 96.1% in Group III. The difference was significant (P< 0.05). The mean eye opening (mins) was 11, 13 and 14, response to commands (mins) was 14, 20 and 21, first oral intake (mins) was 31.5, 29.4 and 30.2, ambulation (mins) was 52.3, 75.4 and 54.0, discharge home (mins) was 72.6, 77.8 and 78.5, behaviour score in PACU before meeting parent(mins) was 2.3, 2.2 and 1.3, after meeting parent (mins) was 1.2, 1.1 and 1.0 and postoperative emesis was 13%, 15% and 22%. A non- significant difference was observed (P> 0.05).

Conclusion: Both oral ketorolac and acetaminophen are safe and effective analgesics for perioperative pain management in children undergoing bilateral myringotomy. They can be used alone or in combination with other analgesics to provide multimodal pain management.

Keywords: Acetaminophen, Bilateral myringotomy, Ketorolac, Saline

INTRODUCTION

Bilateral myringotomy is a common surgical procedure in children, which involves the insertion of ventilation tubes into the eardrums to treat recurrent otitis media. Postoperative pain management is crucial in this procedure to ensure optimal patient comfort and minimize complications.[1]

Perioperative pain management is essential for ensuring optimal outcomes in children undergoing surgery. Two commonly used analgesics for perioperative pain management in children are oral ketorolac and acetaminophen. Both medications have been studied extensively and are generally considered safe and effective for children.[2]

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Oral ketorolac is a nonsteroidal anti-inflammatory drug (NSAID) that has potent analgesic properties. It works by inhibiting the production of prostaglandins, which are responsible for producing pain and inflammation. Ketorolac is available in tablet form and is typically administered 30-60 minutes prior to surgery. It is often used in combination with other analgesics to provide multimodal pain management.[3]

Several studies have demonstrated the efficacy of oral ketorolac in reducing pain in children undergoing surgery. Acetaminophen, also known as paracetamol, is another commonly used analgesic for perioperative pain management in children. Unlike ketorolac, acetaminophen does not have anti-inflammatory properties, but it does have analgesic and antipyretic effects.[4] It works by inhibiting the production of prostaglandins in the brain, which are responsible for producing pain and fever. Several studies have demonstrated the efficacy of oral acetaminophen in reducing pain in children undergoing surgery.[5] We performed this study to assess perioperative effect of oral ketorolac and acetaminophen in children undergoing bilateral myringotomy (BMT).

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected seventy five paediatric patients of ASA physical status I or II scheduled to undergo elective BMT of both genders. Parent's consent was obtained before starting the study.Data such as name, age, gender etc. was recorded. Patients were divided into three groups of 25 each. Group I received saline (placebo), Group II acetaminophen (10 mg/kg) and Group III ketorolac (1 mg/kg). No other preanaesthetic medications were administered.

Anaesthesia was induced and maintained with nitrous oxide and halothane via a face mask technique. The child' s behaviour during induction was assessed using a four- point scale: 1 was assigned to a calm child, 2 to a crying child who could be easily consoled, 3 to a crying child who resisted the application of the face mask, and 4 to a severely agitated child. The time from the start of induction to loss of consciousness was recorded, along with the duration of the operation and anaesthesia (time from start of induction to arrival in the PACU). Parameters such as duration of anaesthesia and surgery, induction behaviour, oxygen saturation, incidence of postoperative emesis and recovery times was recorded. The results were compiled and subjected for statistical analysis using Mann-Whitney U test. P value less than 0.05 was set significant.

RESULT

Table I Patients distribution

Groups	Group I	Group II	Group III
Drug	Saline	acetaminophen	ketorolac
M:F	15:10	12:13	11:14

Group I had 15 males and 10 females, Group II had 12 males and 13 females and Group III had 11 males and 14 females (Table I).

Table II Comparison of parameters

Parameters	Group I	Group II	Group III	P value

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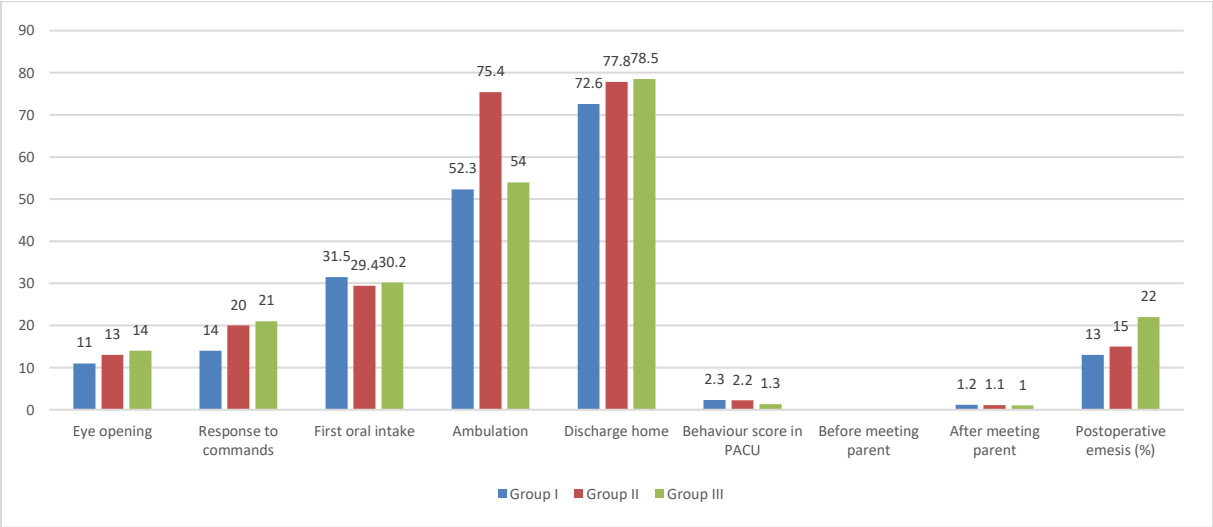
Duration of surgery (min)	8.4	8.0	7.4	0.72
Duration of anaesthesia (min)	14.7	14.3	13.9	0.85
Oxygen saturation on arrival in PACU (%)	96.4	96.3	96.1	0.86

Duration of surgery was 8.4 minutes in group I, 8.0 minutes in group II and 7.4 minutes in group III. Duration of anaesthesia was 14.7 minutes in group I, 14.3 minutes in group II and 13.9 minutes in group III. Oxygen saturation on arrival in PACU was 96.4% in group I, 96.3% in group II and 96.1% in group III. The difference was significant (P< 0.05) (Table II).

Table III Recovery data from end of surgery

Parameters (mins)	Group I	Group II	Group III	P value
Eye opening	11	13	14	0.57
Response to commands	14	20	21	0.41
First oral intake	31.5	29.4	30.2	0.92
Ambulation	52.3	75.4	54.0	0.64
Discharge home	72.6	77.8	78.5	0.52
Behaviour score in PACU Before meeting parent	2.3	2.2	1.3	0.05
After meeting parent	1.2	1.1	1.0	0.14
Postoperative emesis (%)	13	15	22	0.05

The mean eye opening (mins) was 11, 13 and 14, response to commands (mins) was 14, 20 and 21, first oral intake (mins) was 31.5, 29.4 and 30.2, ambulation (mins) was 52.3, 75.4 and 54.0, discharge home (mins) was 72.6, 77.8 and 78.5, behaviour score in PACU before meeting parent(mins) was 2.3, 2.2 and 1.3, after meeting parent (mins) was 1.2, 1.1 and 1.0 and postoperative emesis was 13%, 15% and 22%. A non- significant difference was observed (P> 0.05) (Table III, graph I).



Graph I Recovery data from end of surgery

DISCUSSION

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Bilateral myringotomy (BMT) is a surgical procedure in which small incisions are made in both eardrums to relieve pressure and fluid build up caused by middle ear infections. This procedure is commonly performed on children who have recurring ear infections, and it can often help to reduce the frequency and severity of these infections.[6] The surgery is typically performed under general anesthesia, and it is generally considered to be a safe and effective procedure. After the surgery, the child may experience some mild discomfort and hearing loss for a few days, but this usually resolves on its own.[7] It is important for parents and caregivers to closely follow the post-operative care instructions provided by the surgeon, which may include instructions for keeping the ears clean and dry, avoiding certain activities or environments that could increase the risk of infection, and administering any prescribed medications.[8,9] We performed this study to assess perioperative effect of oral ketorolac and acetaminophen in children undergoing bilateral myringotomy (BMT).

Our results showed that group I had 15 males and 10 females, group II had 12 males and 13 females and group III had 11 males and 14 females. Watcha et al[10] in their study 90 healthy children undergoing bilateral myringotomy were administered oral acetaminophen and ketorolac, when administered 30 min before induction of anaesthesia. Anaesthesia was induced and maintained with halothane and nitrous oxide via a face mask. Postoperative pain was assessed by a blinded observer using an objective pain scale. The three study groups were similar with respect to demographic data, duration of anaesthesia and surgery, induction behaviour, oxygen saturation, incidence of postoperative emesis and, recovery times. The ketorolac group had lower postoperative pain scores and required less frequent analgesic therapy in the early postoperative period compared with the acetaminophen and placebo groups. In contrast, there were no differences in pain scores or analgesic requirements between the acetaminophen and the placebo groups.

Our results showed that duration of surgery was 8.4 minutes in group I, 8.0 minutes in group II and 7.4 minutes in group III. Duration of anaesthesia was 14.7 minutes in group I, 14.3 minutes in group II and 13.9 minutes in group III. Oxygen saturation on arrival in PACU was 96.4% in group I, 96.3% in group II and 96.1% in group III. Bennie et al[11] compared the postoperative analgesic effects of preoperatively administered oral acetaminophen or ibuprofen. Forty three ASA I or II children age six months or older scheduled for elective BM&T were randomized to receive acetaminophen (paracetamol) 15 mg/kg, ibuprofen 10 mg/kg, or placebo. Postoperative pain was assessed using the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) upon arrival to the PACU and at 5, 10, 15, 30, 45, and 60 min. CHEOP scores did not differ between the groups at any time. There was no difference in the number of children receiving rescue analgesia. This study showed no benefit of preoperatively administered oral ibuprofen 10 mg/kg or acetaminophen 15 mg/kg over placebo for the relief of postoperative pain in children undergoing BM&T.

Our results showed that the mean eye opening (mins) was 11, 13 and 14, response to commands (mins) was 14, 20 and 21, first oral intake (mins) was 31.5, 29.4 and 30.2, ambulation (mins) was 52.3, 75.4 and 54.0, discharge home (mins) was 72.6, 77.8 and 78.5, behaviour score in PACU before meeting parent(mins) was 2.3, 2.2 and 1.3, after meeting parent (mins) was 1.2, 1.1 and 1.0 and postoperative emesis was 13%, 15% and 22%. Tobias et al[12] assessed efficacy of the preoperative administration of oral acetaminophen (15 mg/kg) versus acetaminophen (10 mg/kg) and codeine (1 mg/kg). Fifty ASA grade I or II patients were randomized to receive oral midazolam premedication (0.7 mg/kg) mixed in either acetaminophen or acetaminophen with codeine elixir. Anesthesia was induced and maintained with halothane in nitrous oxide and

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oxygen. Postoperative pain was assessed at four times during the postoperative course using an objective pain scale. The two groups were similar with respect to age, weight, gender, duration of anesthesia, and duration of the surgical procedure. The patients who received acetaminophen with codeine had lower pain scores at all four points when compared with patients who received acetaminophen. None of the 25 patients who received acetaminophen with codeine required supplemental analgesics compared with 12 of 25 who received acetaminophen. No adverse effects were noted in either group. We conclude that the preoperative administration of acetaminophen with codeine provides superior analgesia after bilateral myringotomy and placement of PE tubes.

CONCLUSION

Both oral ketorolac and acetaminophen are safe and effective analgesics for perioperative pain management in children. They can be used alone or in combination with other analgesics to provide multimodal pain management.

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