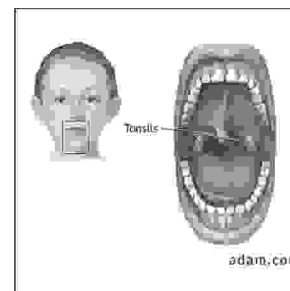


ORIGINAL

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ANALGESIA; FOR CHILDREN UNDERGOING TONSILLECTOMY (A CLINICAL TRIAL OF THREE ANALGESIC REGIMENS IN A PERIPHERAL HOSPITAL)

**DR. FAYYAZ HUSSAIN, MBBS, FCPS**Combined Military Hospital
Dera Nawab Sahib**DR. MOHAMMAD SIDDIQUE**Pak LVL 11 Fd Hospital
Burundi**DR. AMRAN HAFIZ, MBBS, FCPS**

DHQ Hospital, Skardu

ABSTRACT... fayyazansari@hotmail.com **Background and Objectives:** Pain following tonsillectomy in children is a significant problem that tends to be underestimated. Nonsteroidal anti-inflammatory drugs are effective in the management of mild to moderate post-operative pain in children. They can decrease or even eliminate the need for opioid analgesia, thus reducing the opioid-induced side effects. In this study, I used paracetamol alone and a combination of paracetamol with either mefenamic acid or ibuprofen and examined the analgesia produced by all these three regimens by using Wong and Baker facial pain scale. **Patients and method:** The study comprised of three groups A, B, and C (50 patients in each group selected by non probability convenient method and randomly divided). Analgesia was achieved in group A with paracetamol 20mg/kg, with paracetamol 20mg/kg plus mefenamic acid 10mg/kg in group B and paracetamol 20mg/kg plus ibuprofen 5mg/kg in group C orally in syrup form. Post-operative pain was assessed by Wong & Baker faces pain scale at recovery, 4, 8, 12 and 24 hours. Supplementary analgesia was given with oral mefenamic acid (10 mg/kg) in-group B and ibuprofen (5mg/kg) in-group C; otherwise regular oral paracetamol (20 mg/kg-6 hourly) was given routinely in all three-study groups post-operatively. **Results:** Pain score was significantly higher in paracetamol group as compared to mefenamic acid or ibuprofen groups ($P<0.05$), however there was no significant difference in pain scores between mefenamic acid and ibuprofen groups. **Conclusion:** Although there is still need for improving analgesia for tonsillectomy pain in children but I can acclaim that a combination of mefenamic acid or ibuprofen with paracetamol is still the most useful, cheap and safe strategy in children, which avoids all opioids side effects.

Key words: analgesia, children; pain, tonsillectomy; analgesics, mefenamic acid; surgery, otolaryngological

INTRODUCTION

Tonsillectomy is one of the commonest surgical procedures performed in the field of otolaryngology. The most common and distressing symptoms, which follow anaesthesia and surgery, are pain and emesis¹. The

provision of adequate analgesia after tonsillectomy presents the anaesthesiologist with difficulties as this is a painful procedure and may be associated with significant bleeding into the airway². Analgesics such as opioids used to provide effective analgesia for

tonsillectomy³ may be associated with side effects like sedation, respiratory depression and vomiting⁴, which may make recovery hazardous after pharyngeal surgery particularly in children. Non-steroidal anti-inflammatory drugs not only produce good analgesia but also avoid opioid side effects. Peri-operative use of NSAIDS has been limited because of concerns over increased post-operative bleeding, which has been demonstrated with ketorolac^{5,6} although apparently not for other NSAIDS⁷.

Paracetamol has been shown to be a safe and relatively effective analgesic in children^{8,9} but insufficiently potent if used alone for tonsillectomy pain¹⁰. Its adequate use is associated with less postoperative nausea, vomiting, and has a morphine sparing effects⁴.

Ibuprofen is a time tested, effective and cheap non-steroidal anti-inflammatory drug, which has been shown to be fairly effective for relief of tonsillectomy pain in children when combined with paracetamol². Mefenamic acid is a good analgesic and anti-inflammatory drug when used in adults but there is dearth of literature supporting its use for tonsillectomy pain in children. The absence of sedation, respiratory depression, emesis and urinary retention make NSAIDS ideal analgesics for postoperative pain relief in children⁷.

MATERIALS AND METHODS

The study was carried out at District headquarters hospital Skardu after prior approval of hospital ethics committee. A total of 150 patients were selected by non-probability convenient sampling and were randomly divided in three groups i.e. A, B, and C (50 patients in each group). Group A was a control one and patients in this group received only syrup paracetamol 20mg/kg orally 1 hour before surgery with 10ml of clear water. In group B patients were pre-medicated with syrup paracetamol 20mg/kg and syrup mefenamic acid 10mg/kg to a maximum of 250mg orally 1 hour before surgery with 10ml of clear water. Group C received syrup paracetamol 20mg/kg and syrup ibuprofen 5mg/kg to a maximum of 200mg orally 1 hour before surgery with 10 ml of clear water.

The anaesthetic technique was uniform for all groups undergoing tonsillectomy. Induction was achieved with

Inj. propofol 2mg/kg and intubation facilitated by atracurium 0.5mg/kg. Anaesthesia was maintained with isoflurane in 33% oxygen and 67% nitrous oxide with intermittent positive pressure ventilation. On conclusion of surgery, muscle relaxation was reversed with neostigmine and atropine.

Pain was assessed subjectively by using "Wong and Baker faces pain scale"¹¹ (0 no pain-5 intense pain). A day before surgery the patients included in the study were introduced to Wong and Baker faces pain scale. Routine postoperative analgesia was achieved by syp paracetamol (20mg/kg) in all groups starting from 2 hrs of recovery. At 4 hrs of recovery all the groups were again assessed, and in patients of group B and C who were having Wong and Baker faces pain scale ≥ 3 were given supplement analgesia. In group B the supplement analgesia was given by syp mefenamic acid (10mg/kg) and in group C the supplementation was done with syp ibuprofen (5mg/kg). No supplement analgesia was given to group A at any time. Two hrs after each routine dose of syp paracetamol, pain was assessed and supplemental analgesia was given in group B and C in those having Wong and Baker faces pain scale ≥ 3 .

Inclusion/ Exclusion Criteria

Patients of both sex having 5 to 12 years of age and physical status of ASA I & II were included in the study. Patients were excluded from the studies that were having the history of sensitivity to any NSAID, severe asthma, bleeding diathesis, any hepatic or renal impairment.

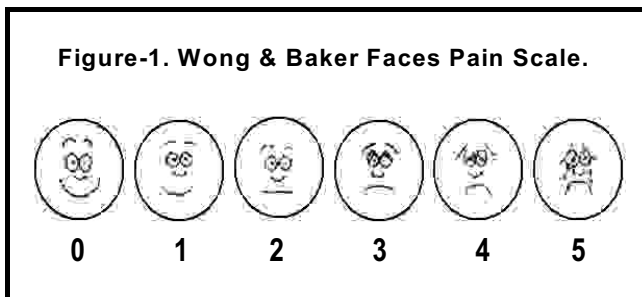
RESULTS

A total of 150 patients were inducted in the study (50 patients in each group A, B, and C). All patients completed the study. The groups were similar in age, sex, and duration of operation. There were no statistical differences between the groups in any of these variables (table I).

Wong and Baker faces pain scale (0 no pain, 5 intense pain) was used to assess pain (Fig 1). Comparison of faces pain scale between groups A, B and C at recovery, 4, 8, 12, and 24 hrs was shown in figures 2 and 3. At recovery the pain score was almost identical in all the groups.

Variables	Group A (n=50)	Group B (n=50)	Group C (n=50)
Age (years)	9.58±2.00	8.98±1.98	9.57±1.89
Weight (Kg)	20.6±2.50	19.94±2.41	20.58±2.30
Gender (F:M)	23:27	22:28	21:29

At 4 hrs of recovery 25 patients (50%) in paracetamol group were having Wong and Baker faces pain scale ≥ 3 while in group B and C they were 9 (18%) and 10 (20%) respectively (Fig 2) and were given the supplementary analgesia. The number of patients in all the groups having pain scale ≥ 3 at subsequent interval is shown in Fig 2. Pain score was significantly higher in patients receiving paracetamol alone ($P < 0.05$). Supplementary analgesia was given only to group B and C and there was no significant statistical difference of Wong and Baker faces pain scale and the requirement of supplementary analgesia between group B and C (Fig 3).

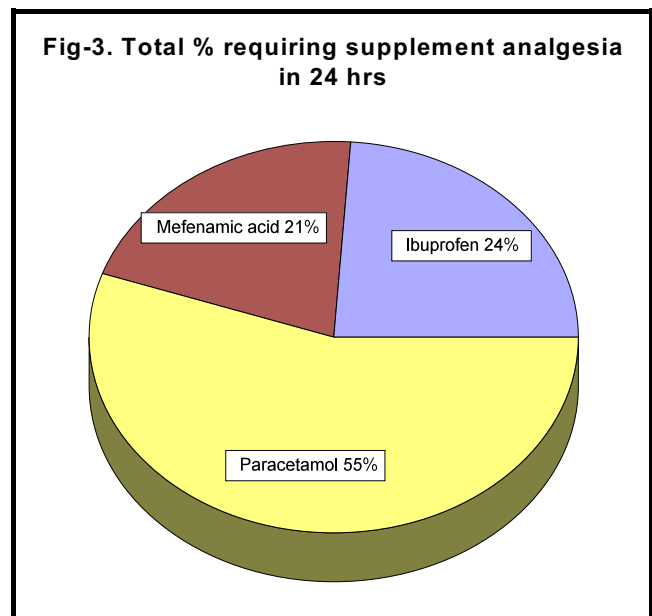
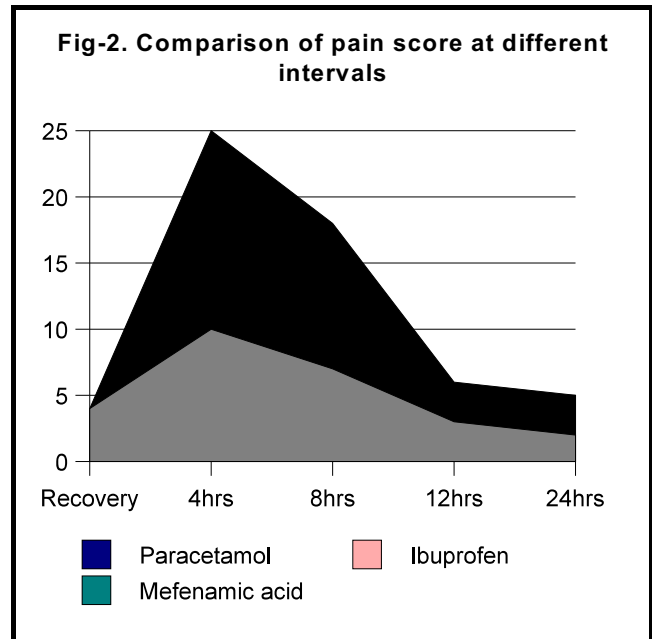


DISCUSSION

Post-tonsillectomy pain remains a considerable clinical problem in children. Although systemic opioids have been extensively used to treat post-tonsillectomy pain, there is increased incidence of vomiting, and the risks of respiratory depression and airway obstruction. This study suggested that mefenamic acid or ibuprofen in combination with paracetamol, when used pre-emptively for post tonsillectomy pain had a better pain relief when compared with paracetamol alone. The clinical importance of this finding is indicated by higher pain scores in the control group i.e. paracetamol (Fig 2, 3).

Pickering AE, Bridge HS ² found in their study that

paracetamol alone provided adequate analgesia for just 24% of the children. This emphasized the difficulty in providing pain relief in children with contraindications to NSAIDs. Recent studies had demonstrated improved analgesic efficacy with higher doses of oral or rectal paracetamol which achieve higher plasma concentrations^{8,9}.



Nielsen et al¹² and Ariendt-Nielson et al¹³ demonstrated a one hour delay between peak plasma paracetamol concentrations and maximum analgesia. It was thus prudent to administer paracetamol pre-emptively one hour before surgery orally to get maximum per-operative analgesia. Romej M¹⁴ and his colleagues provided evidence that pre-emptive acetaminophen may enhance analgesia in pediatric tonsillectomy patients. They further added that preoperative acetaminophen is a safe, quick, and inexpensive.

Several recent papers^{4,6} had demonstrated the need to supplement paracetamol analgesia after tonsillectomy in children. Hyllested M¹⁵, Jones S, in their study also concluded that the addition of NSAID to paracetamol might confer additional analgesic efficacy compared with paracetamol alone. It should be noted that the dose of paracetamol used in this study was a usual oral dose, but recent studies have demonstrated improved analgesic efficacy with higher doses of oral paracetamol (40mg/kg) or rectal (40-60mg/kg)^{8,9}.

A review of 192 cases performed by Van Pelt WL¹⁶ suggested that mefenamic acid was safe, well tolerated, and minimized the need for narcotic analgesic agents during the early postoperative period. In my study of its comparison with ibuprofen, I found mefenamic acid to be equi-analgesic but cost effective to ibuprofen. No untoward effects noted in children undergoing tonsillectomy with its short-term use.

The results of my study also concur with the study done by Pickering A.E and Stoddart P.A² who concluded that peri-operative combination of ibuprofen with paracetamol was a useful strategy in children without increased risks of complications. The balanced approach for analgesia for tonsillectomy includes paracetamol and one of the non-steroidal anti-inflammatory drugs along with some peri-operative opioids which was proposed by Kehlet H.¹⁷ In our setup we avoided opioids for peri-operative pain relief in children undergoing tonsillectomy due to already described concerns. Instead different techniques including local infiltration or topical bupivacaine¹⁸, pre-emptive analgesia or dexamethasone are being used for peri-operative pain relief.

CONCLUSION

Postoperative pain relief remains a difficult problem in children and needs comprehensive management due to the concerns of postoperative bleeding into the airway, emesis and respiratory depression associated with the use of opioids. The use of paracetamol alone had been very popular in past due to its wide margin of safety. This study shows that it is not that effective when used alone so it should be combined with either ibuprofen or mefenamic acid to get the maximum benefit in paediatric analgesia. Although there is a little published literature on use of mefenamic acid for tonsillectomy pain in children but its short term use in this study has shown equal and comparable effectiveness to ibuprofen. This combined analgesic approach is very suitable regimen for pain control in children at every set up, but particularly at peripheral hospitals where postoperative monitoring and care is very limited.

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