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## Risk of post adenotonsillectomy hemorrhage of ibuprofen in comparison to acetaminophen in children

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### Abstract

**Objective:** The aim of the present study is to evaluate and compare the postoperative risk of bleeding of ibuprofen versus paracetamol used as analgesics after pediatric tonsillectomy with or without adenoidectomy.

**Method:** A retrospective study was conducted involving 600 pediatric patients, underwent tonsillectomy with or without adenoidectomy (TS w/wo AD) which had been done at Al-Salam Teaching Hospital from July 2017 to august 2018. The data analyzed included, age, gender, postoperative follow up and monitor for pain and bleeding (early and late).

**Result:** The study was conducted on 600 patients with (TS w/wo AD). The average age was 5.5 years (309 males, 291 females). Postoperative bleeding was not increased, in comparison to that of paracetamol. Nausea and vomiting were less in cases of ibuprofen than that of paracetamol.

**Conclusion:** Ibuprofen could be used safely as posoperative pain control medication. Paracetamol could be used too alone or with ibuprofen. Ibuprofen is effective in control postop pain, and reduces the need for opioids

**Keywords:** Ibuprofen, paracetamol, adenotonsillectomy

### Introduction

Bleeding post adenotonsillectomy is usually estimated to occur in 1%-2% of cases. There seem to be a slightly higher incidence of bleeding among older children and adults. There is no proven relation between increased risk of bleeding and any specific technique used in (TS w/wo AD). More over meticulous intra operative hemostasis, regardless of the technique used, will lead to acceptable postoperative hemorrhage rate <sup>[1]</sup>. One of causes of post adenotonsillectomy hemorrhage was infection, mostly in secondary bleeding. Postoperative antibiotics have been recommended to diminish infection and decrease rate of bleeding. In addition patients who are less than 3 years old are at increased risk of bleeding and other complications <sup>[2]</sup>. Significant morbidities are associated with adenotonsillectomy, ranging from postoperative bleeding, pain (which could be moderate to severe), to emotional effect and psychological disorders <sup>[3]</sup>. So adequate analgesia is important in the immediate postoperative period. Narcotics as a potent pain killer have a significant emetic effect and should be conservatively used. We think paracetamol and/or ibuprofen is a good choice to control postoperative pain and to avoid the use of narcotics. Paracetamol is a safe drug, meanwhile ibuprofen has been shown to cause significantly less postoperative nausea and vomiting than narcotics, also concerns that effect of this drug on platelets function might increase bleeding from the tonsil bed are largely theoretical. Ibuprofen is effective in diminishing postoperative pain <sup>[4]</sup>. A recent analysis of previous studies reported no increased risk of bleeding with ibuprofen after adenotonsillectomy <sup>[5]</sup>.

### Patients and Method

670 children were included in this study, have undergone (TSw/wo AD) for the period from July 2017 to august 2018 at Al-Salam teaching hospital/ Mosul, with one operating room and team of 3 surgeons.

### Exclusive criteria

- Patients with known personal or family history of bleeding disorder.
- Patients have history of asthma, kidney or liver problem.
- Patients on ibuprofen or other non-steroid anti-inflammatory drugs (NSAID) within 1 week of surgery.
- Patients with allergy to aspirin, ibuprofen or other NSAID.

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All patients had same standard anesthetic regimen. Dexamethasone sodium phosphate is routinely administrated. The adenotonsillectomy have been done by the "cold steel" technique, using sutures with mono polar diathermy to ensure hemostasis. Patients were admitted to the surgical ward and full investigations had been done, including complete blood count and clotting profile. All patients were kept for at least 24 hours post-surgery with close monitor for any sign of bleeding including pulse rate, blood pressure, respiratory rate, and PO<sub>2</sub>by oximetry had done regularly. After exclusion criteria, 600 patients were studied as having undergone (TSw/wo AD). Patients were divided to two main groups, first group had received oral ibuprofen alone, The dose was 150-200 mg 3 times a day, maximum 30 mg /kg per day. Second group had received oral paracetamol with a dose of 200-250 mg every 4-6 hours; maximum 4 doses per day. Both groups have same follow up to 14 days post-surgery (for primary and secondary hemorrhage). Primary bleeding was checked at hospital, while a secondary bleeding was checked by instruct parents to closely monitor the patient (provided the time of arrival within 30 minutes to hospital). If the parents notice any blood come out the mouth or nose.

## Results

We identified 600 patients who undergone adenotonsillectomy, 70 patients were excluded and were not subjected to study. Most (more than 90 %) patient were less than 12 years old, ranging between 6.5 and 3.4 years, median age was 5.5 years. Out of 600 patients 580 (96.6%) patients did not experience any bleeding postoperatively while 20 patients (3.3%) did so [3 patients (0.5%): early17 patients (2.8%): late] table1.

### In ibuprofen group

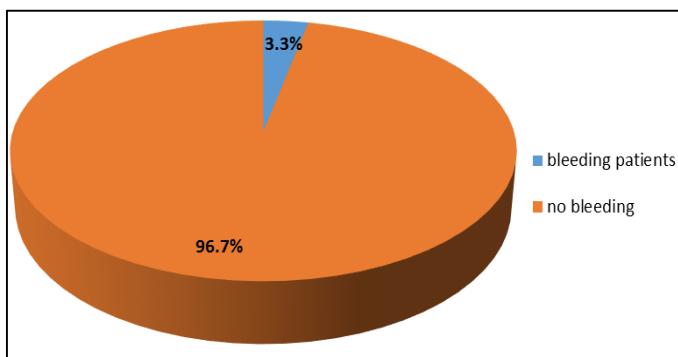
Total patients were 200, there were no bleeding in 194 (97%) patients while 6 (3%) patients suffered post-surgery bleeding [primary: 1(0.5%) patient ... secondary: 5(2.5%) patients] table 1.

### In paracetamol group

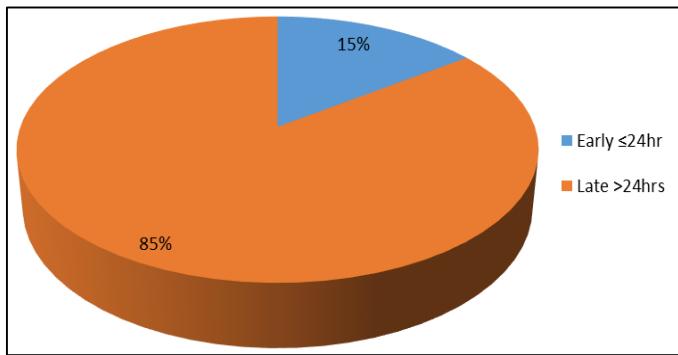
Total number were 400. Of these 386 (96.5%) patients have no bleeding while 14 (3.5%) patients suffered postop. Bleeding [primary 2 (0.5%) patients/ the secondary 12 (3%) patients] table 1.

**Table 1:** Patients distribution with rate of bleeding

Clinical characteristics	Total No.	Patients without bleeding (%)	Patients with bleeding No. (%)		
			All	Early ≤24hr	Late >24hrs
Full Cohort	600	580. (96.7%)	20 (3.3%)	3 (0.5%)	17 (2.8%)
Ibuprofen group	200	194 (97%)	6 (3%)	1 (0.5%)	5 (2.5%)
Paracetol group	400	386 (96.5%)	14 (3.5%)	2 (0.5%)	12 (3 %)



**Fig 1:** total bleeding rate among all patients



**Fig 2:** rates of early and late bleeding

paracetamol with ibuprofen found no increased risk for hemorrhage with ibuprofen. Ibuprofen has equal analgesic properties to paracetamol. In our study, we have shown that the risk of postoperative bleeding is not increased with use of ibuprofen. Few studies have studied the severity of post-operative bleeding whether direct effect of ibuprofen use or late presentation to the emergency department. Platelet function temporarily altered and usually returns to normal within 12 hours after administration of ibuprofen [8]. Jeyakumar of Cleveland clinic and colleagues in their study of 1160 children below 16 years of age noted a 2.61% postoperative bleeding rate in patients who were not received ibuprofen perioperatively, and a 1.02% postoperative bleeding rate in patients who took ibuprofen. The team found no immediate postoperative bleeding in their study and no statistical difference in bleeding rates between patients that received NSAIDs and those who did not. Colin S. Barber of Auckland medical school of New Zealand in his study of 1433 children from 1993 to 2006 who undergone (TS w/wo AD). All children were given both acetaminophen and a NSAID (usually ibuprofen 20 mg /kg/day in 3 divided doses) for 10 days. He confirmed that NSAIDs used perioperatively and throughout the postoperative period do not contribute to an increase in the postoperative hemorrhage rates and can be considered in the management of post tonsillectomy pain. A study within the university of Rochester cohort showed that there were only 5 bleeding episodes among 485 patients who had been given NSAIDs postoperatively and this was not statistically significant ( $p=0.16\%$ ) and, ultimately the authors of the study concluded that ibuprofen is not contraindicated after adenotonsillectomy and can be used safely in post-operative pain control (5mg/kg every 6 hrs) in children without history of bleeding disorders regardless of surgical technique that have been used (cold steel vs. diathermy vs.

microdebrider vs. coblation). Lauren E Kelly and colleagues (university of Toronto 2014) in their study on post tonsillectomy pain control concluded that ibuprofen (with or without acetaminophen) provides effective and safe analgesia for post procedural pain with no increase episodes of bleeding. F. Bruder in a clinical trial using ibuprofen (combined with acetaminophen) versus morphin as analgesia for post tonsillectomy pain management in 91 children aged 1- 10 years for OSA found no increase in bleeding rate in ibuprofen group.

### **Conclusion**

Tonsillectomy with or without adenoidectomy is one of the most common surgical procedures performed in children. Postoperative pain management with optimum analgesia while achieving the maximal safety profile is the main objective. Ibuprofen is now widely and safely used in postoperative pain control and in our study the risk of postoperative bleeding was not increased. Additional studies may be needed to investigate this association.

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