

Post-adenotonsillectomy analgesia in children: The place of non-steroidal anti-inflammatory drugs

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Abstract

Background: Adenotonsillectomy and tonsillectomy are common surgeries carried out in children under 15 years of age with associated significant pains; therefore, adequate post-operative pain management is mandatory to ensure full recovery. Non-steroidal anti-inflammatory drugs (NSAIDs), being cheap and readily available, could be used to achieve this.

Objective: The objective was to determine the effectiveness of post-operative analgesia in these children using NSAIDs – diclofenac sodium/ibuprofen.

Methods: All children admitted for adenotonsillectomy/tonsillectomy in the Ear, Nose and Throat surgery department from April 2016 to March 2017 were recruited. All the patients had diclofenac suppository at 1.5 mg/kg immediate post-operative period and then 12 hourly for 48 h and subsequently ibuprofen oral suspension at 5 mg/kg/dose 8 hourly for 5 days. Swallowing and the time of commencement of oral intake were used as indices to ascertain effective or adequate analgesia. The time of commencement of oral intake both for liquids and solids including the duration of hospital stay was documented and analysed using SPSS software version 20.0. The results were presented using simple statistical tables.

Results: A total of 78 children were recruited, of which only 75 underwent the full study. The age ranged from 11 months to 14.5 years with 47 males and 28 females. The age group of 2.6–4.5 years was the most commonly seen, which constituted 43.59%, whereas 46.67% of these patients commenced oral intake in 0–6 h post-operation. There was no post-operative bleeding recorded. There was a mortality of 3.85%.

Conclusion: NSAIDs at regular intervals offer effective analgesia after adenotonsillectomy and appear to be safe in children.

Keywords: Adenotonsillectomy, analgesia, non-steroidal anti-inflammatory drugs, oral intake

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Received: 16.07.2018, **Accepted:** 14.12.2018

INTRODUCTION

Adenotonsillectomy/tonsillectomy remain the most common surgeries done in children aged under 15 years, with approximately 5 million surgeries performed each year worldwide.^{1,2}

These surgeries are associated with significant morbidity and rarely mortality.³ Common complications that have been recorded after tonsillectomy include respiratory depression, hypovolaemia secondary to decreased oral intake and post-operative haemorrhage.³ Adenotonsillectomy is associated with

Access this article online	
Quick Response Code:	Website: www.phmj.org
	DOI: 10.4103/phmj.phmj_15_18

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How to cite this article: Ibekwe UM, Oghenekaro E. Post-adenotonsillectomy analgesia in children: The place of non-steroidal anti-inflammatory drugs. Port Harcourt Med J 2019;13:41-5.

significant pains. There are records of severe pains reported by children following adenotonsillectomy, especially in the first 24 h.⁴ It is also known that, after throat surgeries, pain is most intense during swallowing.⁵ In these patients, pain can affect the duration of hospital stay, oral intake and return to regular function.⁶ Inadequate provision of analgesia or pain control can lead to decreased or poor oral intake;⁷ therefore, pain relief after adenotonsillectomy in children is of utmost importance since this will determine their degree of oral intake and therefore hydration and consequently full recovery from the surgery. Pains seen as referred otalgia and odynophagia following tonsillectomy is said to be caused by inflammations and its mediators, nerve irritation and disruption of the mucosa.^{6,8} It is important to note that patients undergoing these surgeries are young and often have obstructive symptoms, and therefore do not cope up with drugs such as morphine due to respiratory depressant effects. They also could have hypoxic episodes postoperatively.⁹ Therefore, improvement in analgesia after adenotonsillectomy is required but without complications such as post-operative nausea and vomiting, bleeding and respiratory distress, especially in patients with obstructive sleep apnoea.¹⁰ Therefore, the choice of analgesics in these children must be a drug that is non-sedating and non-respiratory depressing. Non-steroidal anti-inflammatory drugs (NSAIDs) are found to have these properties.¹¹ NSAIDs inhibit both cyclo-oxygenase-1 and 2 and prevent the production of prostaglandins which cause pain and inflammations.¹² Updated recommendations for post-tonsillectomy/adenotonsillectomy analgesia exclude codeine and suggest regular administration of paracetamol and NSAIDs,¹³ but their effects on platelet aggregation has always been a drawback and hence the possibility of bleeding. However, some studies showed no increased risk of bleeding with NSAIDs after tonsillectomy in children.¹⁴ It has been found that, when comparing the use of morphine and ibuprofen, NSAID, there was similar analgesic effectiveness with no tonsillar bleeding or adverse reaction recorded with ibuprofen.¹⁵

Importantly, the pain experienced by the child in hospital after the surgery predicts the behavioural problems and pain at home;¹⁶ hence, effort is made to have a proper and effective pain control before hospital discharge.

This study aimed to determine how effective our pain management is in these patients and also to ascertain how safe NSAIDs (diclofenac and ibuprofen) are as analgesics postoperatively in these children.

METHODS

It was a prospective study carried out from April 2016 to March 2017 in the Ear, Nose and Throat (ENT) surgery department. Approval was obtained from the Ethical Committee of the hospital. All patients admitted for adenotonsillectomy within this period were recruited except those who did not give their consent. Informed consent was obtained from all the participants. The dissection method for tonsillectomy with adenoid curettage is the only form of adenotonsillectomy carried out at this centre. Data obtained were entered into a pro forma. Information obtained included biodata, clinical features, complications, drugs given and dosages.

All the patients had diclofenac suppository at a dosage of 1.5 mg/kg in the immediate post-operative period; after extubating, it was continued 12 hourly for the first 48 h and thereafter converted to oral suspension of ibuprofen at 5 mg/kg/dose 8 hourly subsequently for 5 days. Patients in addition received broad-spectrum antibiotics parenterally for the first 48 h as well. The ability to swallow and time of commencement of oral intake after full recovery from anaesthesia were used as indices of effective pain control. In younger children, age <4 years, the inability to swallow that is manifested as spitting of saliva or drooling was identified as odynophagia and therefore poor pain control while the older children in addition to refusal to swallow, inform their caregivers about the pain. These were assessed in the patients at 6 hourly intervals after full recovery from anaesthesia in the first 24 h. These findings as well as the time of commencement of oral intake (cold drinks and ice cream) and solid foods were all documented including the duration of hospital stay. These drugs are said to be safe when administered in their therapeutic doses as documented in the present study; there is no record of untoward effects such as increased bleeding with their use. Data were analysed using the statistical package for the social science (SPSS) software version 20.0 (SPSS INC, IBM Company, America). The results were presented using simple statistical tables.

RESULTS

There were altogether 78 children recruited into the study. Three mortalities were recorded in the intraoperative and immediate post-operative periods, and hence only 75 cases were fully studied.

The age ranged from 11 months to 14.5 years. There were 47 males and 28 females with a ratio of 1.6:1. The age range of 2.6–4.5 years was the most commonly seen

($n = 34, 43.59\%$), while fewer participants were recorded aged 10.6 years ($n = 2, 1.33\%$) [Table 1]. Snoring was the most common clinical symptom ($n = 75, 96.15\%$) seen in these cases [Table 2]. Majority of these patients, ($n = 35, 46.67\%$) could swallow their saliva without pain and commenced oral intake within 0–6 h of full recovery from anaesthesia [Table 3]. A minimal percentage of these children ($n = 2, 2.66\%$) commenced solid food within the first 6 h; however, by the 13th–18th h after recovery, appreciable number ($n = 16, 21.33\%$) could take solids. Majority of these children ($n = 31, 41.33\%$) started solid intake after 19–24 h of recovery from anaesthesia.

While 5.33% of these patients were discharged home after 24 h of surgery, majority of the patients ($n = 69, 92\%$) were discharged after 48 h [Table 4]. The mortality recorded was ($n = 3$) 3.85%. The most common complication was fever which was seen in four cases. Only one intraoperative bleeding was recorded in a sickle cell disease patient [Table 5].

DISCUSSION

Adenotonsillectomy is one of the most common surgeries carried out in the ENT department.^{17,18} At this centre, it accounted for 21.5% of all ENT operations.¹⁹ There was a male preponderance in this study as noted by other researchers.²⁰ Majority of the population in this study fell within the age range of 2.6–4.5 years (43.59%). In view of the very young age range, post-operative pain management can be a challenge and is also of utmost importance. Various methods of analgesia have been advocated; however, each has its own drawbacks. Because codeine is known to vary in analgesic efficacy as well as known to cause depression of respiration following adenotonsillectomy in children, its use in these children has also been banned.²¹ In this study, suppository of NSAID diclofenac sodium and later oral suspension of ibuprofen were used to effect pain control in these 75 children. It is known that inadequate pain management or control affects the degree of oral intake and hydration, hospital stay and finally full recovery from the surgery.⁶ In order to ascertain the effectiveness of the pain management, the parents were asked to note painful swallowing or the inability to swallow in their children, often shown by refusal to swallow food or drooling and spitting of saliva. The time taken for them to commence oral intake (both liquids and solids) is very important. The better the analgesic control, the faster they commence oral intake. It was noted that most of these patients commenced oral intake within 0–6 h of full recovery from anaesthesia; this agrees with the findings in a similar study by Tawalbeh

Table 1: Age distribution

Age (years)	Male	Female	Total	Percentage
0-2.5	11	5	16	21.33
2.6-4.5	20	11	31	41.33
4.6-6.5	11	7	18	24.0
6.6-8.5	3	1	4	5.33
8.6-10.5	1	3	4	5.33
10.6-12.5	1	0	1	1.33
12.6-14.5	0	1	1	1.33
Total	47	28	75	100

Table 2: Presenting symptoms

Symptoms	Frequency (%)
Snoring	75 (97.3)
Mouth breathing	74 (97.3)
Sleep apnoea	56 (73.3)
Recurrent nasal discharge	63 (84.0)
Recurrent cough	50 (66.7)
Poor feeding	31 (41.3)
Delayed speech	15 (20.0)
Hearing loss	5 (6.7)
Voice change	8 (10.7)
Excessive daytime sleepiness	3 (4.0)

Table 3: Time of commencement of oral intake

Time (h)	Frequency (%)	
	Liquid/ice cream	Solid food
0-6	35 (46.67)	2 (2.66)
7-12	28 (37.33)	2 (2.66)
13-18	11 (14.67)	16 (21.33)
19-24	1 (1.33)	31 (41.33)
25-48	0	23 (30.66)
>48	0	1 (1.33)
Total	75 (100)	75 (100)

Table 4: Time of discharge from the hospital

Duration (h, post-operative)	Frequency (%)
24	4 (5.33)
48	69 (92)
72	2 (2.6)

Table 5: Complications

Complications	Frequency
Fever	4
Vomiting	1
Poor oral intake	2
Intraoperative bleeding	1
Total	8

et al. where they compared diclofenac with paracetamol.^{22,23} It is of note that majority of the patients ($n = 63, 84\%$) had commenced liquid diet by the 12th h of full recovery. Patients who could not commence oral intake after 12 h of full recovery from anaesthesia had an additional dosage of diclofenac suppository administered but not more than three doses in 24 h. In contrast, some other researchers found the inability of NSAIDs to achieve analgesia in the first 24 h postoperatively.²⁴ Unlike similar studies of pain management in children where scales such as the

Visual Analogue Scale or Faces scale as well as the Faces, Legs, Activity, Cry and Consolability scale were used, we decided to use indices such as swallowing, oral intake and hospital stay to determine the efficacy of the analgesia because this appears to be easier to assess in these children in our environment. Most of these children when in pain refuse to feed or even swallow saliva. At our centre, tolerating orally and adequately is one of the main criteria for discharge. We are also aware of the practice of day case adenotonsillectomy in some centers especially in the more developed countries where good roads, effective telephone network and reliable ambulance services are all available in the event of the patient requiring urgent/emergency hospital readmission; this however is not commonly practised in our environment. The policy of not discharging the patients until their oral intake is established and adequate as well as having no complications, prevents readmission because post-operative pain, nausea and vomiting are known to be responsible for hospital readmission rate of up to 14% in children.²⁵ There was no record of readmission in the present study. Majority of these patients were found to commence and tolerate adequate oral intake within the first 24 h. Few of these patients (5.33%) were discharged home after 24 h post-operation, while majority (92%) were discharged home 48 h post-surgery, the departmental policy being that no patient that is not tolerating orally gets to be discharged home. There was no post-operative bleed recorded in this study following the use of NSAIDs.

There was one reactionary bleed noted and it was in a known sickle cell disease patient who was yet to commence the analgesic before the incidence. This same patient was part of the 3.85% mortality recorded. The other two mortalities recorded were from anaesthetic complications in the immediate post operative period.

Limitation

The small study population and the absence of control group constituted the study limitations.

CONCLUSION

NSAIDs such as diclofenac and ibuprofen are effective and safe for analgesia following adenotonsillectomy in children. The fear has always been about post-operative bleeding, but it was not seen in the present study. NSAIDs are cheap, convenient and the route of administration makes it acceptable in these children, thereby enhancing compliance.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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