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Adenoid and tonsil surgeries in children: How relevant is pre-operative blood grouping and cross-matching?

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ABSTRACT

Background: As a part of pre-operative evaluation, several otolaryngologists group and cross-match blood routinely for children undergoing adenoid and tonsil surgeries. This practice has generated several debates either in support or against this practice. The aim of this study is to critically evaluate the incidence of post-tonsillectomy (with or without adenoidectomy) bleeding and blood transfusions in otherwise healthy children with adenoid/tonsil pathologies conducted in the University of Port Harcourt Teaching Hospital (UPTH). **Patients and Methods:** A descriptive retrospective study of children who underwent adenoid and tonsil surgeries in the Department of Ear, Nose and Throat (ENT) surgery of UPTH from January 2003 to December 2012. Children with family history of bleeding disorders and derangement of clotting profile as well as different co-morbidity like sickle cell disease were excluded from this study. The patients' data were retrieved from the registers of ENT out-patient clinics, theatre registers and patients case notes. Demographic data, indications for surgery, preoperative investigations, complications and management outcomes were recorded and analyzed. **Results:** Out of 145 children that had adenoid and tonsil surgeries; only 100 met the criteria for this study. The study subjects included 65 males and 35 females (male: female ratio 1.9:1) belonging to 0-16 years age group (mean age: 3.46 ± 2.82 years). The age group of 3-5 years had the highest (n = 40, 40%) number of surgeries. Adenotonsillectomy was the commonest (n = 85, 85%) surgery performed on patients who had obstructive sleep apnea (OSA). The commonest (n = 6, 6%) complication was haemorrhage, and only few (n = 3, 3%) patients had blood transfusion. However, mortality was recorded in some (n = 3, 3%) patients. **Conclusion:** This study confirms that the incidence of post adenoidectomy/tonsillectomy bleeding in otherwise healthy children is low and rarely requires blood transfusion. We can conclude that routine preoperative blood grouping and cross-matching of blood for all children undergoing elective adenoid and tonsil surgeries seemed irrelevant and not cost effective. However, it could be carried out in only special circumstances.

Key words: Adenoidectomy, blood grouping and cross-matching, clotting profile, preoperative evaluation, tonsillectomy

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INTRODUCTION

Adenoidectomy and tonsillectomy are common otolaryngological surgical procedures that are performed worldwide to remove the adenoid and tonsils, especially in children who have obstructive sleep apnoea (OSA).[1] These are two distinct surgical operations, but are often done as a combined procedure (adenotonsillectomy) depending on the indication for the surgery.[2] These procedures have some life-threatening complications, notably among them is haemorrhage, especially when the patient has history suggestive of bleeding disorders, derangements of clotting profile, co-morbidities and poor surgical technique.

Locally, reports from various centre in Nigeria revealed that 310 tonsillectomies had been performed over 5 years in Enugu,[3] while, in Lagos, 115 cases were recorded over 3 years.[4] The indications for surgery are well-documented in literatures; however, the commonest in children is OSA syndrome.[1] Several literatures have commented on local traditional surgical treatments for throat pathologies (tonsils and uvula inclusive), and these have been associated with very high mortality and morbidity.[5-8]

Serious complications from bleeding during adenoid and tonsil surgeries, including re-hospitalization and death are very rare, but they can happen. There is always a risk of bleeding during tonsillectomy, since the tonsils are close to major blood vessels. There are two times during which postoperative bleeding is most likely to occur: Within the first 24 h after surgery and 6-10 days after surgery, when the scabs come off. It is estimated that 0.2-2.2% of patients haemorrhage within 24 h after surgery and 0.1-3.7% of patients experience postoperative bleeding 6-10 days after surgery. To reduce the incidence of both intra-operative and postoperative bleeding during and after adenoid/ tonsil surgeries, besides good surgical skills, most otolaryngologists perform preoperative investigations such as clotting profile, full blood count, preoperative grouping and cross-matching of blood. [9]

Meanwhile, from our experience and observation in UPTH, majority of our patients who were asked to acquire blood prior to the surgery were not transfused, and no auditing has been done to evaluate the usefulness of this practice. Therefore, this study was carried out to critically evaluate the incidence of post-tonsillectomy (with or without adenoidectomy) bleeding and blood transfusions in otherwise healthy children with adenoid/tonsil pathologies in the University of Port Harcourt Teaching Hospital (UPTH).

PATIENTS AND METHODS

This was a descriptive retrospective study of children that had adenoid and tonsil surgeries in the department of Ear, Nose and Throat (ENT) surgery of UPTH from January 2003 to December 2012. Children with family history of bleeding disorders and derangement of clotting profile as well as different co-morbidities like sickle cell disease were excluded from this study. The patients' data were retrieved from the registers of ENT out-patient clinics, theatre registers and patients case notes. Demographic data, indications for surgery, preoperative work-up, complications, duration of stay in the hospital and management outcomes were recorded and analyzed. Descriptive data was illustrated using simple statistical tables and percentages, while categorical data like mean and standard deviation were calculated using SPSS for window 16.

RESULTS

Out of 145 children with adenoid and tonsil surgeries, 100 met the criteria for this study. There were 65 males and 35 females (male: female ratio 1.9:1) with an age range of 0-16 years (mean age: 3.46 ± 2.82 years). The age group of 3-5 years had the highest (n = 40, 40%) number of surgeries [Table 1]. The commonest (n = 85, 85%) adenoid/ tonsillar surgeries conducted was adenotonsillectomy on account of OSA [Table 2].

The prevalence of haemorrhage following adenoid/ tonsil surgeries in otherwise healthy children was 6%. The commonest complication was reactionary haemorrhage, and it occurred in 4 patients who underwent adenotonsillectomy. Two patients' had secondary haemorrhage; this occurred among those patients who had only tonsillectomy [Table 3]. As part of the management of the haemorrhage, 3 patients had blood transfusion, of which 2 of them were found postoperatively to have clotting profile derangements after a repeat of clotting profile tests. The third patient that was also transfused with blood was later found to have sickle cell disease postoperatively and she was among the patients that had the secondary haemorrhage. The patients with reactionary haemorrhage following adenotonsillectomy were managed actively with gauze packing of the tonsillar beds coupled with ligation of bleeding vessels seen and postnasal space packing with

Table 1: Age distribution of patients n=100

Age in years	Number	Percentage (%)
0-2	25	25.0
3-5	40	40.0
6-8	20	20.0
9-11	10	10.0
12-14	3	3.0
>14	2	2.0

Table 2: Types of adenoid/tonsil surgeries and indications n=100

Type of surgery	Indication	Number	Percentage (%)
Adenotonsillectomy	Obstructive sleep apnoea	85	85.0
Tonsillectomy	Recurrent acute tonsillitis	10	10.0
Adenoidectomy	Recurrent ear infections	5	5.0

Table 3: Patients complications following adenoid/tonsils surgery n=100

Complications following adenoid/tonsils surgeries	Number	Percentage (%)
Reactionary haemorrhage following adenotonsillectomy	4	4.0
Secondary haemorrhage following tonsillectomy alone	2	2.0
Postoperative respiratory distress following adenotonsillectomy	2	2.0
Cardiac arrest following adenotonsillectomy	1	1.0
No complications	91	91.0

Foleys catheter. Mortality was recorded in 3 patients because of severe respiratory distress and cardiac arrest.

DISCUSSION

This study revealed the incidence of complication to be 9% following adenoid and tonsil surgeries in our series. Postoperative haemorrhage accounted for 6%, of which only 3% had blood transfusion. In our study, as in most others in the developing world, the dissection method was used. The incidence and risk of haemorrhage appeared low in our series as well as in other series.[10-13] However, the risk of haemorrhage may be eliminated if better surgical techniques are used such as coblation, electrocautery and radiofrequency.[14]

In spite of these setbacks, adenoidectomy and tonsillectomy continue to be safe otolaryngological surgical procedures. The commonest type of haemorrhage we encountered was reactionary haemorrhage; we did not encounter primary haemorrhage, however, other researchers documented primary haemorrhage in their series.[15]

Adenotonsillectomy was found to be the commonest type of operation in this study, which agrees with the findings of other studies.[16,17] The age group of 3-5 years was found to have the highest incidence of adenoid and tonsil surgeries, and the commonest indication for surgery was hypertrophy of the adenoid and tonsils causing OSA.[1,18] The age group of 3-5 years appeared to be the peak age for obstructive hypertrophy of these tissues.

We are aware that some researchers have associated postoperative bleeding with the prolonged use of non-steroidal anti-inflammatory drugs (NSAIDs) in some patients prior to the surgery and in some patients with clotting profile derangements.[19] In our series, there was a paucity of information on some patients' drug history, and there were even deceptive results as two of our patients were later found to have deranged clotting factors and another one had sickle cell disease after a repeat genotype blood test. This scenario may be due to either poor record keeping on the side of the team that managed the patients or outright mistake on the part of the laboratory scientists, and these were the patients who were transfused.

The majority of patients were discharged home on the second postoperative day. This compares favourably with what was obtainable in other centres in the sub-Saharan region.[2,7,11] Nevertheless, we are aware that day case adenotonsillectomy is fully in practice in most centres in the developed world. This form of surgery is now increasing in trend; however, the risk has always been the possibility of managing severe reactionary haemorrhage outside the hospital setting. In the places where it is practiced, proper patient selection, well-equipped health facilities and functioning ambulance services appear to reduce this risk.[2,20]

The estimated cost of procuring a unit of blood after carrying out blood grouping and cross-matching in our centre and most developing countries varies between $65 USD (N10, 000) and $100 USD (N15, 000), and this is expensive to the common man. In most countries in the sub-Saharan region of Africa, majority of the population cannot afford to spend even one US dollar in a day[21] and the additional charge of acquiring blood, which in many occasions were not utilized, considerably increases the cost of healthcare service delivery to the population.[22]

The rational of carrying out clotting profile/coagulation tests in all patients was to identify those patients that had the potentials for bleeding during or after surgery. Therefore, patients who had good clotting profile are unlikely to develop bleeding as complication, if the surgical technique is satisfactory. The practice of routine preoperative blood grouping, cross-matching and transfusion is irrelevant except for patients whose history and preoperative clotting profile are suggestive of bleeding disorders. However, no universal practice of preoperative screening for increased risk of bleeding has been adopted by all otolaryngologists.

Robbins and Rose believed that predictable risk for bleeding abnormality could be ascertained from well-obtained history and a review of readily available laboratory results.[9] On the contrary, several studies have demonstrated that neither preoperative bleeding history nor routine laboratory screening to detect clotting profile derangements are reliable predictors of postoperative bleeding.

Furthermore, laboratory screening may be useful in patients who have a history suggestive of a major bleeding disorder. Even in these individuals, screening tests such as the partial thrombin (PT) and partial thromboplastin time (PTT) may fail to identify some patients with bleeding disorders.[23] This perhaps occurred in 2 of our patients who were later found to have clotting profile derangements. Meticulous surgical technique is among the most important factors assuring that postoperative heamostasis is maintained regardless of the patient's history of bleeding disorders, co-morbidities and preoperative preparations. With a negative family history

for bleeding, routine preoperative coagulation studies may not be recommended by some otolaryngologists. With a positive family history of bleeding disorders and bleeding time, a consultation with a haematologist is prudent and a request for preoperative blood grouping and cross-matching may be justified.

The mortality we had in our series was due to postoperative respiratory distress and cardiac arrest, which were attributed to poor monitoring of patients during the immediate postoperative period. Meanwhile, the incidence of mortality can be reduced to the barest minimum if both invasive and non-invasive monitoring devices are available for use in the recovering rooms and patients' wards.

CONCLUSION

A good surgical technique and expertise of the surgeon more often than not can prevent haemorrhage complicating adenoid/tonsil surgeries. However, this study confirms that the incidence of post adenoidectomy/tonsillectomy bleeding in otherwise healthy children is low and rarely requires blood transfusion. We can conclude that routine preoperative blood grouping and cross-matching of blood for all children undergoing elective adenoid and tonsil surgeries seemed irrelevant and not cost effective. Nevertheless, it could be carried out only in special circumstances.

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