

## The Use of Postoperative Antibiotics in Tonsillectomy: A Comparative Study

Nehad Hassan AbdElrahman\*, Ahmed Fathy Mohamed Awad, Usama Taya

Department of Otorhinolaryngology, Qena Faculty of Medicine, South Valley University, Qena, Egypt

\*Corresponding author: Nehad Hassan AbdElrahman, Mobile: 00201032106653, Email: nehadhassan918@gmail.com

### ABSTRACT

**Background:** After a tonsillectomy, the bared tonsillar fossa becomes colonised by the oral bacterial flora, which can cause a strong localised inflammatory reaction, pain aggravation, and a delay in healing. The present study aimed to evaluate and compare the effect of antibiotics given orally or intravenously with no antibiotic protocol on post-bipolar diathermy tonsillectomy morbidity.

**Patients and methods:** From January 2021 to January 2022, a total of 300 patients indicated for tonsillectomy. Those patients were divided into three equal groups. Group I received injectable antibiotic in the first two days' post-operative followed by oral amoxicillin clavulanic acid for another 5 days. Group II received oral antibiotic (amoxicillin clavulanic acid 7 days postoperative. Group III didn't receive antibiotic postoperative period.

**Results:** Vomiting and secondary diarrhoea were observed in high frequency in patients who received oral antibiotic (group II). Other data included fever, pain score and return to normal diet and normal activity showed no significant differences between the different groups.

**Conclusion:** Based on the current study, there is no effect of antibiotics use on speed of recovery and pain score. New multi-center clinical trials are warranted to confirm such findings.

**Keywords:** Tonsillectomy, Antibiotics, Pain score, Qena Faculty of Medicine, Comparative study.

### INTRODUCTION

After a tonsillectomy, the bared tonsillar fossa becomes colonised by the oral bacterial flora, which can cause a strong localised inflammatory reaction, pain aggravation, and a delay in healing. As a result, the tonsillar bed will get contaminated, which will raise the risk of complications and cause the development of oropharyngeal symptoms [1-2].

An antibiotic and paracetamol were used to treat postoperative fever, which was caused by bacteria during surgery [3].

Glossopharyngeal and/or vagus nerve fibre damage causes postoperative pain, which is then brought on by pharyngeal muscle spasms that cause ischemia. 14–21 days following surgery, pain may linger until the muscle mucosal coating is complete. As a result, the majority of ENT doctors decide to recommend antibiotics after tonsillectomy [4].

However, there is vast variance in practise around the globe. For example, a recent research from the UK found that just 12% of otolaryngologists regularly administer antibiotics [5], whereas a different study found that the percentage was 79% among American otolaryngologists. Reduced pain, reduced inflammation, and quicker healing are the most often cited benefits of consistent antibiotic use [4].

Some authors disagree, arguing that there is insufficient proof to link infection with postoperative morbidity in a direct causative manner. As a result, the issue is still up for debate. Additionally, although subsequent haemorrhage is typically linked to infection and treated with antibiotics in such individuals, it is unknown if there is a causative link and whether the risk is decreased [6].

The antibacterial range of amoxicillin and clavulanic acid, a B-lactamase stable antibiotic, encompasses most Gram-negative bacilli, Gram-positive cocci, and oropharyngeal anaerobes. The

common bacteria that cause chronic recurrent tonsillitis are effectively neutralised by it [7].

A parental expanded-spectrum cephalosporin, ceftriaxone is particularly suited to the treatment of acute otitis media that has not responded to earlier treatments because to its pharmacological properties [8-9] and microbiological action against oropharyngeal bacteria [10-11].

American Association Guidelines have advised against regular use of antibiotics in post-tonsillectomy patients, except in cases of post-operative fever [12]. In our practice, all our patients are given oral antibiotics after tonsillectomy, and we have conducted this study to evaluate and compare the effect of antibiotics given orally or intravenously with no antibiotic protocol on post-bipolar diathermy tonsillectomy morbidity.

### PATIENT AND METHOD

#### *Study setting and design*

A randomized controlled trial was done in ENT department, South Valley University, in the period from January 2021 to January 2022.

#### *Participants*

Three hundred patients indicated for tonsillectomy in this period was divided into three equal groups.

**Group I** consists of patients who received injectable antibiotic in the first two days post-operative (third generation cephalosporin either IV or IM followed by oral amoxicillin clavulanic acid for another 5 days.

**Group II** consists of patients who received oral antibiotic (amoxicillin clavulanic acid 7 days' post-operative.

**Group III** consists of patients who hadn't received antibiotic post-operative at all either oral or combined oral and injectable

**Methodology**

Surgery was carried out using the bipolar diathermy under General Anaesthesia with endotracheal intubation by senior surgeon for all groups. Discharge was recommended after 24 hour postoperative except if complicated.

**Follow up**

Follow up was done on the third, seventh and tenth day postoperative for all patients by the same investigators. Patients with primary haemorrhage was excluded to avoid more infection in large traumatic bared tonsillar area, and prolonged manipulation. Questionnaire was fulfilled in the follow up period include fever, pain, vomiting, diarrhoea, day of return normal diet and activity and incidence of secondary haemorrhage from the parents and data analysed and compared (table 2).

**Ethical consent:**

An approval of the study was obtained from South Valley University Academic and Ethical Committee. The investigation of this study was explained to every parent of the child as an elective method. These methods were not invasive and carry no harm or risk to patient. Consent was received from every patient. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

**Statistical analysis**

Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Sciences). Data were presented as number, percentage, mean and standard deviation. Chi-square and Fisher Exact tests were used to compare between qualitative variables. ANOVA/ Post-hoc (LSD) test was used to compare quantitative variables among groups. P-value considered statistically significant when  $P \leq 0.05$ .

**RESULTS**

**Personnel data of the studied groups (table 1):**

In this study, the mean age of selected groups was 9.92 (SD 3.09), 10.40 (SD 3.58), 10.52 (SD 3.66) for groups I, II, and III respectively, with non-significant p values. Male percentages were 61%, 56%, and 53%, and female percentages were 39%, 44%, and 47% in groups I, II, and III respectively, with non-significant p values (Table 1).

**Table (1): Personal data of the studied groups.**

Variable	Group I (n= 100)	Group II (n= 100)	Group III (n= 100)	P-value
<b>Age: (years)</b>				
Mean ± SD	9.92 ± 3.09	10.40 ± 3.58	10.52 ± 3.66	0.430
<b>Sex:</b>				
Male	61 (61%)	56 (56%)	53 (53%)	0.438
Female	39 (39%)	44 (44%)	47 (47%)	

Data expressed as mean (SD), frequency (percentage). P value was significant if  $\leq 0.05$ .

**Postoperative Questionnaire in the studied groups (table 2):**

Fever and pain in all group was mainly in the first 2 days postoperative with the means were 1.59 (SD 0.49), 1.47 (SD 0.50), 1.60 (SD 0.49) for fever, and 2.12 (SD 0.81), 2.24 (SD 0.92), 2.09 (SD 0.83) for pain in groups I, II, and III respectively, with non-significant p values. Rebound of pain was noticed on the fifth day in group III.

Return to normal diet and normal activity were within the first 2 days postoperative with the mean in groups I, II, and III were 2.82 (SD 0.76), 2.70 (SD 0.66), 2.86 (SD 0.79) for diet and 2.55 (SD 0.64), 2.59 (SD 0.62), 2.67 (SD 0.71) for activity respectively, with non-significant p values.

Thirteen patients (13%) in group I and 64 patients (64%) in group II and 9 patients (9%) in group III complained from vomiting with statistically significant differences between group I and II and group II and III but not between group I and III. Only 10 patients (10%) in group I and 58 patients (58%) in group II and 7 patients (10%) in group III presented with secondary diarrhea with statistically significant differences between group I and II and group II and III, but not between group I and III.

Only 2 patients (2%) in group I and 9 patients (9%) in group II and 4 patients (4%) in group III represented with secondary hemorrhage mainly on the seventh and tenth day all of them treated conservatively except 1 patient in group III undergone reanesthesia and suturing with statistically significant differences between group I and II, but not between group II and III and between group I and III.

**Table (2): Postoperative questionnaire in the studied groups.**

Variable	Group I (n= 100)	Group II (n= 100)	Group III (n= 100)	P- value <sup>1</sup>	P- value <sup>2</sup>	P- value <sup>3</sup>	P- value <sup>4</sup>
	Mean ± SD	Mean ± SD	Mean ± SD				
<b>Fever (days)</b>	1.59 ± 0.49	1.47 ± 0.50	1.60 ± 0.49	0.121	0.088	0.887	0.065
<b>Pain score</b>	2.12 ± 0.81	2.24 ± 0.92	2.09 ± 0.83	0.423	0.322	0.804	0.216
<b>Return to normal diet (days)</b>	2.82 ± 0.76	2.70 ± 0.66	2.86 ± 0.79	0.282	0.251	0.702	0.126
<b>Return to normal activity (days)</b>	2.55 ± 0.64	2.59 ± 0.62	2.67 ± 0.71	0.425	0.668	0.199	0.391
<b>Vomiting No. (%)</b>	13 (13.0%)	64 (64.0%)	9 (9.0%)	0.000*	0.000*	0.366	0.000*
<b>Secondary diarrhoea No. (%)</b>	10 (10.0%)	58 (58.0%)	7 (7.0%)	0.000*	0.000*	0.447	0.000*
<b>Secondary hemorrhage No. (%)</b>	2 (2.0%)	9 (9.0%)	4 (4.0%)	0.065	0.030*	0.683	0.152

Data expressed as mean (SD), frequency (percentage). *P* value was significant if  $\leq 0.05$ . 1: Comparison among all groups. 2: Comparison between Group I and Group II. 3: Comparison between Group I and Group III. 4: Comparison between Group II and Group III.

## DISCUSSION

Antibiotics administration in the post-tonsillectomy period is a routine practice all over the world, it is based on the suggestion that it will reduce the bacterial count in the tonsillar site and consequently prevent infection and improve recovery [4, 13-15].

Post-tonsillectomy morbidity prevention remains one of the controversial topics. Tonsillectomy is associated with significant morbidity, particularly during the first week after the procedure. Associated morbid conditions include postoperative haemorrhage, lethargy, halitosis, and pain [16].

In this study presence of fever was in the first two days > or= 38 with no significant between the three group and this agree with other studies [17-18] that reported in their study no decrease in fever with the use of antibiotics but disagree with other studies [19-20] that have found a decrease in the rate of fever with the use of antibiotics.

Pain in all groups in our study was mainly in the first 2 days postoperative with the *p* value statistically non-significant between all groups. Rebound of pain was noticed on the fifth day in group III and this agree with **Al-Layla and Mahafza** [21] in their study which revealed that Antibiotic administration did not decrease the number of days with throat pain. On the contrary it increased throat pain duration in patients who received antibiotic but disagree with **Colreavy et al.** [7], on the other hand, reported a decrease in the severity and duration of pain in the post-tonsillectomy period with the use of antibiotic prophylaxis.

Pain may not be due to the increase in number of bacteria in the post-operative tonsillar fossa but rather due to surgical trauma to the peritonsillar tissues, due to loss of pharyngeal mucosa with exposed muscle and nerve endings or due to the inflammatory response to surgical trauma that occurred during tonsillectomy [7, 13, 22-24].

In our study, vomiting and secondary diarrhoea was observed in high frequency in patient received oral

antibiotic followed by patient received injectable antibiotic first two days followed by oral with the least frequency in patient with no antibiotic regimen with the *p* value significant between statistically significant between group I and II and group II and III but not between group I and III the higher frequency in oral antibiotic may be related to combined effect of immediate oral antibiotic and possible intraoperative swallowed blood.

This agree with **Padia et al.** [25] who reported that the use of antibiotics (especially oral antibiotics may lead to gastric upsets, nausea, vomiting, and allergic reactions in IV antibiotics) have unwarranted side effects, and disagree with **Junaid et al.** [6], who found that the patients receiving oral antibiotics did not complain of any drug-related adverse reaction, and relay this on the possibility that most of the patients have been prescribed in the past, multiple antibiotics for their recurrent tonsil infection and hence they tolerated it well.

In this study, patients with primary hemorrhage was excluded and no reactionary hemorrhage was found but secondary hemorrhage was in high frequency in patient who received oral antibiotic (9%), followed by patient who did not received antibiotic (4%) then patient with loading injectable antibiotic (2%) with secondary hemorrhage mainly on the seventh and tenth day. All of them treated conservatively except one patient in group III undergone re-anesthesia and suturing with statistically significant differences between group I and II but not between group II and III and between group I and III and this agree with previous study [21].

Also, **Al-Layla and Mahafza** [21] proposed that probably, forceful and repeated swallowing of the antibiotics had put patients with oral antibiotic under stress and caused some sort of trauma and consequently bleeding or it could be due to the sloughing of membranes after few days of tonsillectomy as was proposed by **Krishna et al.** [4].

Return to normal diet and normal activity in our study were within the first 2 days postoperative with the mean in groups I, II, and III with non-significant p values, and this disagree with **Mann et al.** [17], **Cannon** [19] and **Khan et al.** [26] who reported no difference in the duration of time required to return to full normal diet with the use of antibiotics, but disagree with other studies [7, 13].

## CONCLUSION

Our study suggests the importance of prescribing antibiotics after tonsillectomy, bearing in mind the possibility of an increase in infection, especially in rural areas in Upper Egypt. However, it was found that there is no effect in its use, whether in the speed of recovery or the occurrence of complications. On the contrary, oral antibiotic had side effects like nausea, vomiting and increased bleeding.

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