



INTRA-OPERATIVE ASSESSMENT OF HYDROGEN PEROXIDE & NORMAL SALINE AS A HAEMOSTATIC AGENT IN TONSILLECTOMY

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ABSTRACT

A common indication for Tonsillectomy is Chronic Tonsillitis, among others. The surgery is largely safe irrespective of the method used. Haemorrhage can be a life-threatening complication post Tonsillectomy if it is not identified and treated immediately. Various techniques are used to achieve haemostasis and prevent haemorrhage including surgical tie, cautery, local application of adrenaline or hydrogen peroxide among others. To understand the vasoconstrictive and haemostatic properties of Hydrogen Peroxide in Tonsillectomy bleed. Sixty-five (65) patients undergoing Tonsillectomy for Chronic Tonsillitis were part of the study. To avoid bias, dissection of the right tonsil was taken as Group 1 and left tonsil as Group 2. Normal Saline-soaked cotton ball was used to give local pressure in the tonsillar fossa in Group 1 and 3% Hydrogen Peroxide-soaked cotton ball was used in Group 2. Blood loss and time taken to dissect were taken as parameters of study. In Group 1, it took 18.24 min on an average from first incision to completion. In Group 2, it took 15.55 min on an average from first incision to completion. The time in Group 2 was 14.74% lesser than Group 1. The average blood loss in Group 1 was 66.27 ml and in Group 2 the same value stood at 51.22 ml. The blood loss in Group 2 was 22.71% lesser than in Group 1. There were no complications encountered. Powered by Editorial Manager and ProduXion Manager from Aries Systems Corporation 3% Hydrogen Peroxide is a potent agent for antimicrobial activity and haemostasis when introduced in the tonsillar fossa post tonsillectomy. When used in moderation, it is very effective in preventing blood loss. Also, there are no serious complications associated with the use of Hydrogen Peroxide as a haemostatic agent.

KEYWORDS : Chronic tonsillitis · Tonsillectomy · Hydrogen peroxide · Haemorrhage · Dissection and snare

INTRODUCTION

Palatine Tonsils are components of the immune system. Tonsils are immunologically more active in the first years of life [1]. After multiple episodes of acute infection, bacteria inoculate into the core of the tonsil producing symptoms [2]. These infections are highly frequent especially in childhood. Although antibiotic therapy is usually sufficient for acute tonsillitis, Tonsillectomy is still the treatment of choice in the management of Recurrent and Chronic Tonsillitis [3].

Despite being the commonest and simplest surgery the surgeon is always keep about the high risk of complications in Tonsillectomy i.e. intra and post-operative haemorrhage which may even lead to shock and death [4].

Hydrogen Peroxide (H₂O₂) is produced in many different human cell types like fibroblast, vascular endothelial, smooth muscle and inflammatory cells [5].

It also plays key roles in regulating vascular smooth muscle cell (VSMC) growth, differentiation, and vascular inflammation [6–7].

Delivering hydrogen peroxide into wounds kills fibroblasts and occludes local microvasculature [8].

When H₂O₂ dissociates, it forms Water [H₂O] and Nascent Oxygen [O]. This nascent oxygen has oxidative properties and thus helps in achieving surface antimicrobial clearance. Various mechanisms contribute to the vasoconstriction activity of H₂O₂. They include increase in Ca²⁺ influx from intracellular stores in smooth muscle cells; formation of cyclooxygenase-derived prostanoids; activation of enzymes; activation of potassium (K⁺) channels and generation of hydroxyl radicals [10].

The types of bleed encountered in Tonsillectomy are primarily venous bleed and mucosal bleed. The local pressure is usually given with a cotton ball soaked in Normal Saline (NS).

In this study, we have used cotton balls soaked in 3% H₂O₂ to apply pressure in the fossa after dissection to achieve haemostasis.

The concentration of H₂O₂ to be used has been widely studied and documented in previous studies [9]. The amount of blood loss and time taken from first incision to haemostasis are the parameters used for study.

MATERIALS AND METHODS

Sample Size: Sixty five (65).

Type of study: Prospective case control study.

Statistical Analysis: It was performed using the SPSS Statistics 19 for Windows (IBM Corp., Armonk, NY, USA). A P-value of <0.05 was considered statistically significant. The confidence interval was set at 95%.

Inclusion Criteria:

- Age between 6 and 30 years.
- Haemoglobin of more than 10 gm%.
- Clinically diagnosed Chronic Tonsillitis by the Paradise Criteria [12].

Exclusion Criteria:

- Bleeding and Clotting disorders.
- Enlarged tonsils which is not Chronic Tonsillitis e.g. Neoplasm, Abscess.
- Pregnancy and lactation.
- Iatrogenic excessive bleed.
- Chronic systemic illnesses.
- Unilateral tonsillar growth.

Pre-operative Assessment

All the 65 patients underwent detailed evaluation and history taking with examination of Ear, Nose, Throat, Head and Neck. If the patient was found to have Chronic Tonsillitis, he/she was asked for consent to be part of study and General Anaesthesia. All patients with consent were then included in the study.

Intra-operative Assessment

All the patients underwent Tonsillectomy by Dissection and snare method under General Anaesthesia. To avoid surgeon bias, all the surgeries were performed by the same surgeon with the same set of instruments.

For the purpose of convenience, all the tonsils on the Right were included in Group 1 and the ones on the Left were included in Group 2. The first parameter used was the time taken from first incision to achieving complete haemostasis. As soon as the first incision was placed, the timer was started. Suction was not used throughout to calculate accurately the amount of blood lost. Gauze packs were used to mop blood, if any, till the tonsil was dissected out.

In Group 1 (right side), the cotton ball was soaked in NS and placed in the fossa after which gentle pressure was applied using the left index finger. In Group 2 (left side), the cotton ball was soaked in H₂O₂ and placed in the fossa after which gentle pressure was applied using the right index finger. The cotton ball was left for 2 mints after which it was removed and fossa was inspected for any bleed. Care was taken not to use more than 10 ml of solution in both groups. Count of the number of cotton balls were also kept at par for each side. The second parameter was the amount of blood loss on each side. The volume of NS/H₂O₂ was subtracted. The volume of blood in the pack was calculated by dividing the weight of blood on the pack by the specific gravity of blood, i.e. 1.055 [10]. Standard 10 x 10 cm gauze pieces were used for mopping the area according to previously documented studies [11].

Post-operative Assessment

All the patients received the same set of antibiotics and analgesics. Fossa was visualized every 6th hourly for the next 2 days to look for evidence of secondary hemorrhage. No complications of any sort were reported

OBSERVATION AND RESULTS

In our study, 45 were male and 20 were female. In Group 1 where NS was used to achieve hemostasis, it took 18.24 min on an average from first incision to completion. In Group 2 where H₂O₂ was used to achieve hemostasis, it took 15.55 min on an average from first incision to completion (Figure 1). The time in Group 2 was 14.74% lesser than Group 1. The average blood loss in Group 1 was 66.27 ml and in Group 2 the same value stood at 51.22 ml. [Figure 2] The blood loss in Group 2 was 22.71% lesser than in Group 1. The significance was found to be 0.001 in both the Groups.

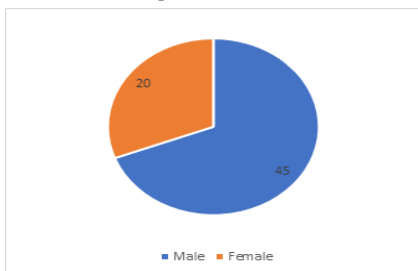


Figure 1 - Gender Distribution

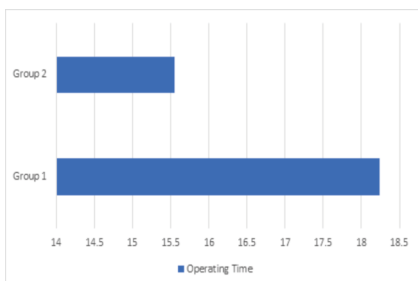


Figure 2 - Operating Time In Minutes

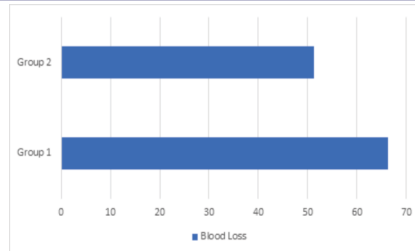


Figure 3 - Blood Loss In ml

DISCUSSION

The beneficial effects of H₂O₂ are plenty ranging from its cost-effectiveness to the fact that there are very few side effects when used in moderation. We have studied the same in our study and the results pointed that the blood loss and time taken to perform the surgery were markedly reduced in side where H₂O₂ was used instead of NS. As a broad categorization, the bleed can be divided into two causes: vascular and mucosal. Venous bleed is mostly from the Peritonsillar vein. Mucosal bleed is accelerated by the movement of the muscles of anterior and posterior pillars. Based on the data obtained by us along the course of the study, there is enough evidence to prove that H₂O₂ can be used instead of various combinations of Adrenaline/lignocaine/Bupivacaine to control a primary hemorrhage post-tonsillectomy.

CONCLUSION

3% Hydrogen Peroxide is a potent agent for antimicrobial activity and hemostasis when placed in the tonsillar fossa post tonsillectomy. When used in moderation, it is very effective in preventing blood loss. Also, there are no serious complications associated with the use of H₂O₂ as a Haemostatic agent.

REFERENCES

- Uppal K, Bois AS (1989) Tonsillar microflora - superficial surface vs deep. The J Laryngol Otol 103(2):175-177
- Discolo CH, Darrow PJ, Koltai KH (2003) Infectious Indications for tonsillectomy. Pediatr Clin NA 50(2):445-458
- Gul M, Okur E, Ciragil P et al (2007) The comparison of tonsillar surface and core cultures in recurrent tonsillitis. Am J Otolaryngol 28(3):173-176
- Muthubabu K, Rekha A, Thejas SR et al (2019) Tonsillectomy by Cold Dissection and Coblation Techniques: A Prospective Comparative Study. Indian J Otolaryngol Head Neck Surg 71:665-670
- Halliwell B, Clement MV, Long LH (2000) Hydrogen peroxide in the human body. FEBS Lett 486:10-13.
- Faraci FM (2006) Hydrogen peroxide: watery fuel for change in vascular biology. Arterioscler Thromb Vasc Bio 26:1931-1933
- Droge W (2001) Free radicals in the physiological control of cell function. Physiol Rev 82:47-95
- Branemark PI, Ekholm R (1967) Tissue injury caused by wound disinfection. J Bone Joint Surg 49:48-62
- Abbasi M, Saeed K (2008) Hydrogen Peroxide 3%: Is it Beneficial in Tonsillectomy? Sultan Qaboos Univ Med J 8(2):201-204
- Agrawal SR, Jain AK, Marathe D, Agrawal R (2005) The effect of bismuth subgallate as haemostatic agent in tonsillectomy. Indian J Otolaryngol 57:287-289
- Ali Algadiem E, Aleisa AA et al (2016) Blood Loss Estimation Using Gauze Visual Analogue. Trauma Mon 21(2):e3413.