

Original Research Article

Evaluate the effectiveness of tonsillectomy and long-acting penicillin on the levels of the antistreptolysin O titer in children with recurrent tonsillitis

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ABSTRACT

Background: Tonsillitis is widespread among children and has serious poststreptococcal complications, and both the patients and clinician have to face the question on what is the role and benefit of using long-acting penicillin and whether it is an alternative method of treatment to surgery?. This study was carried out to evaluate the effectiveness of tonsillectomy compared with long-acting penicillin in the treatment of recurrent tonsillitis, comparing their effects on the levels of the antistreptolysin O titer (ASOT).

Methods: A total of 100 patients aged 4-15 years with recurrent tonsillitis and signs of chronic tonsillitis, after exclusion of patients with bleeding diathesis, anemia, chronic illness, and criteria of rheumatic fever, were included in this study, they were divided to two groups comprising 50 patients each. The first group was treated by tonsillectomy, whereas the second group was treated using long-acting penicillin monthly for 6 months. They were clinically evaluated, ASOT levels were recorded for all patients before management and after 6 months.

Results: The mean ASOT readings before management and after 6 months for the tonsillectomy group were 518.29 and 117.13 IU/ml, respectively (P value <0.004), whereas for the penicillin group, they were 526.70 and 262.98 IU/ml, respectively (P value <0.072).

Conclusions: This study demonstrates that the first line of treatment of recurrent chronic tonsillitis is tonsillectomy, as it is both clinically effective and cost-effective for children and that the second line of treatment is long-acting penicillin with a long-term follow-up and in patients have contraindications for surgery such as bleeding diathesis.

Keywords: Antistreptolysin O titer, Long acting penicillin, Tonsillitis

INTRODUCTION

Chronic tonsillitis refers to the condition in which there is enlargement of the tonsils accompanied by repeated attacks of infection. Although tonsillitis can occur at any age, it is most common in children between the age of 5 and 10 years. The inflamed tonsils harbor numerous types

of bacteria, alone or in combination.^{1,2} Tonsillectomy is the most frequently performed otolaryngological procedure, especially in young children, it is effective in reducing the number and duration of episodes of sore throat in children, the gain being more marked in those most severely affected.^{3,4} Tonsillectomy is the most frequently performed procedure because it is widespread

among children and the poststreptococcal complications (rheumatic fever and glomerulonephritis) are a serious concern. However, pediatricians prefer to treat children with tonsillitis with long-acting penicillin. The recommended dose of benzathine penicillin G is 600,000 U intramuscularly for patients weighing 27 kg (60 lb) or less, and 1,200,000 U for patients weighing more than 27 kg.⁵ Therefore, this study was carried out to evaluate the effectiveness of tonsillectomy compared with long-acting penicillin in the treatment of recurrent tonsillitis, comparing their effects on the levels of the antistreptolysin O titer (ASOT).

METHODS

This is prospective study. Children suffering from recurrent tonsillitis who were attending the otolaryngology and paediatric OPD clinic were included in the study. All patients were recruited in the study in February 2018 to January 2019. A total of 100 patients were selected on the basis of following criteria.

Inclusion criteria

- Age of 4-15 years,
- Children suffering from recurrent tonsillitis with signs of chronic tonsillitis: inequality in the size of the tonsils, enlarged cervical lymph nodes and pus in the tonsillar crypts.⁶
- Severe attacks of tonsillitis: seven times in 1 year or five times in each of 2 years, or three times in each of 3 years.
- According to the guidelines of the American Academy of Otolaryngology-Head and Neck Surgery, tonsillectomy is indicated if:
 - The patient contracts three or more attacks of sore throat per year, despite adequate medical therapy,
 - The attack of tonsillitis is severe enough to cause an abscess, or an area of pus and swelling, behind the tonsils,
 - The tonsillitis did not improve by antibiotics.
 - The child’s swollen tonsils and adenoids impair normal breathing.⁷⁻⁹
- An ASOT of greater than 200 IU/ml.¹⁰

Exclusion criteria

- The child has bleeding diathesis, cardiac disease, anemia, acute infection, poor anesthetic risk, or an uncontrolled medical illness that prevents tonsillectomy.¹¹
- Presence of criteria for rheumatic heart disease and rheumatic fever.¹²

The study population was divided into two groups which were Group A in which the patients who underwent tonsillectomy and Group B in which the patients who were treated with long-acting penicillin.

The two groups were formed randomly using a simple random technique, the tests were performed before tonsillectomy and before starting the long-acting penicillin treatment and were repeated 6 months after the tonsillectomy and long-acting penicillin treatment. Templates were generated in MS excel sheet and data analysis was done using SPSS software (version 20). Results were compared between the groups.

RESULTS

This study included 100 patients, of which 48% were girls and 52% were boys. The distribution of the studied population according to the age group was as follows 40 patients were between 3 and 6 years of age, 27 were older than 6-9 years, 23 were older than 9-12 years, and 10 were older than 12-15 years. The mean age was 8 years (SD=3.04). In the current study, the preintervention ASOT was determined for all the patients (N=100). Antistreptolysin O titer the minimum reading was 256.00, whereas the maximum reading was 663.00 (mean=522.49).

The ASOT levels after 6 months were found to be lower in patients treated by tonsillectomy than in those who were treated with long-acting penicillin, the difference between both the groups was found to be statistically significant (P value=0.023). In the tonsillectomy group, the ASOT was 200 IU/ml or less in 43 patients, greater than 200-400 IU/ml in 4 patients, and greater than 400 IU/ml in 3 patients. In contrast, in the penicillin-treated group, the ASOT was 200 IU/ml or less in 15 patients, greater than 200-400 IU/ml in 23 patients, and greater than 400 IU/ml in 12 patients. The ASOT levels after 6 months were found to be lower in the patients treated by tonsillectomy compared with those who were treated with long-acting penicillin, the difference between both the groups was found to be statistically significant (P-value=0.023) (Figure 1).

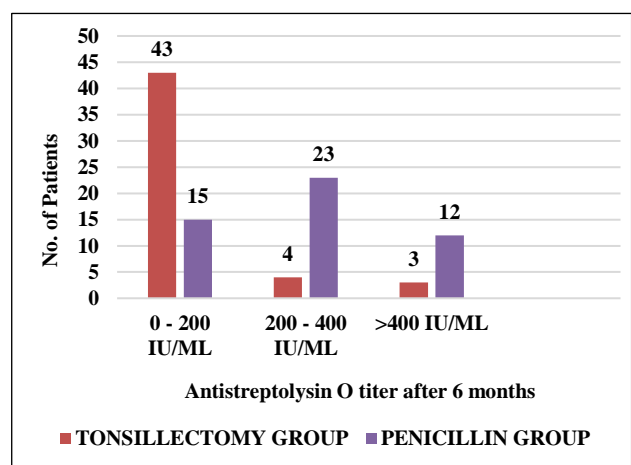


Figure 1: Comparing antistreptolysin O titer readings between the tonsillectomy and penicillin groups after 6 months.

DISCUSSION

Tonsillectomy is the most frequently performed otolaryngological procedure, especially in young children. The most common indication for tonsillectomy is recurrent bacterial tonsillitis. In this study, 100 patients with recurrent tonsillitis were included 52% were boys, whereas 48% were girls. The ages of the patients ranged between 4 and 15 years.

In the group treated by tonsillectomy, the mean readings of ASOT declined from 518.29 IU/ml before to 117.13 IU/ml after 6 months. Authors estimate that after 6 months of tonsillectomy, 93% of patients who underwent the procedure become normal. In the other group treated with long-acting penicillin, the mean readings of ASOT declined from 526.70 IU/ml before management to 262.98 IU/ml after 6 months. Authors estimated that 24% of patients did not reach the normal range after 6 months of treatment with long acting penicillin.

The ASOT levels after 6 months of treatment were found to be lower in patients treated by tonsillectomy than in those who were treated with long-acting penicillin, the difference between both the groups was found to be statistically significant (P value=0.023). On comparison with other studies, we found that, Motta G et al, estimated that ASOT levels become normal in 69.8% of patients, 2 years after tonsillectomy.¹³

The difference is statistically significant (P <0.05) and may be due to the short-term follow-up (6 months) for patients after tonsillectomy in this study compared with the long-term follow-up (2 years) for patients in the study by Motta G et al.¹³ Badr-El-Din MM estimated that ASOT levels were found to be normal in 36 patients (72%) and high in 14 (28%).¹⁴ The difference is statistically significant (P <0.05) and may be due to the short-term follow-up (6 months) for patients after tonsillectomy in this study compared with the long-term follow-up (2 years) for patients in the study by Badr-El-Din MM.

The main problem author faced was that the parents exhibited strong preferences for surgical management of recurrent tonsillitis, some patients from the penicillin group were shifted to surgery, leading to loss of time in selecting new patients to compensate for the dropouts from the penicillin group, however, this predilection of some parents to tonsillectomy did not affect the number of patients that were selected in the long-acting penicillin group, it just increased the study time to include more patients.

Some patients in the long-acting penicillin group complained of severe pain during injections and others had a hypersensitivity reaction to penicillin. Another problem is the paucity of literature resources for the studies on long-acting penicillin and its efficacy on acute antistreptolysin O titer in recurrent tonsillitis.

CONCLUSION

This study demonstrates that the first line of treatment of recurrent chronic tonsillitis is tonsillectomy, as it is both clinically effective and cost-effective for children and that the second line of treatment is long-acting penicillin with long-term follow-up, and in patients, have contraindications for surgery such as bleeding diathesis.

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