

## A Comparative study to evaluate the effectiveness of Tonsillectomy with Long term Penicillin in the management of recurrent tonsillitis

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### ABSTRACT

**Introduction:** Tonsillitis is widespread among children and has serious poststreptococcal complications, and both the patients and the otolaryngology surgeon 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) and erythrocyte sedimentation rate (ESR). **Methods:** This study was carried out as a prospective study. A total of 100 Children were chosen for this study. Subjects fulfilling the inclusion criteria like , Age of 5–15 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 & An ASOT of greater than 400 IU/ml and an ESR of greater than 30 ml/1 at 1/2 h 10,11.were selected by simple random sampling method. **Results :** The frequencies of occurrence of fever, cough, obstructive sleep apnea, unequal tonsil size, and pus in the tonsillar crypts were 80% , 51 % , 4% , 52% , and 48 % , respectively. Effect of tonsillectomy versus the effect of long-acting penicillin on ASOT, we found that the levels after 3 months were lower in patients who were 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. **Conclusion:** This study presents important insight into the alternate treatment regimens of Recurrent Tonsillitis in rural children. 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.

**Keywords:** Recurrent Tonsillitis, Tonsillectomy, Penicillin Therapy, ESR, ASO

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### INTRODUCTION

Paediatric population forms a considerable proportion of the total world's population. More than one third of India's population, which is the world's second most populous country, is children.

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Recurrent Tonsillitis in children is a major public health problem in developing countries. If left

unattended, it may result in various social and psychological problems for affected children and their families. 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.<sup>[1,2]</sup> 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.<sup>[3,4]</sup> 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.<sup>[5]</sup> 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) and erythrocyte sedimentation rate (ESR). Long-term consequences of persistent infection can arise in untreated cases like development disorders, poor academic and educational development and lower overall quality of life. Tonsillitis is widespread among children and has serious poststreptococcal complications, and both the patients and the otolaryngology surgeon 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) and erythrocyte sedimentation rate (ESR)

## METHODOLOGY

This study was carried out as a prospective study involved Prior Consent & was found to be within ethical standards. Children suffering from recurrent tonsillitis and Presented in the ENT OPD Units & health centre situated in Raipur district were chosen. A total of 100 Children were chosen for this study. The study was conducted over a period of 11 months from Aug 2018 to June 2019. Study subjects fulfilling the inclusion criteria like, Age of 5–15 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 <sup>[6]</sup> 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 & An ASOT of greater than 400 IU/ml and an ESR of greater than 30 ml/1 at 1/2 h were selected by simple random sampling method. Detailed Clinical Examination was done. Data was filled in Microsoft Excel & analysed using

computer software Epi Info version 6.2 (Atlanta, Georgia, USA). P value of 0.05 and less was considered as statistically significant. Results were presented in simple proportions and means ( $\pm$ SD). Chi-square test was used to observe any difference between proportions. The results were considered statistically significant if “p” value was less than 0.05. According to the guidelines of the American Academy of Otolaryngology – Head and Neck Surgery 7, 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.<sup>[6-9]</sup>

An ASOT of greater than 400 IU/ml and an ESR of greater than 30 ml/1 at 1/2 h. <sup>[10,11]</sup>

A pre-designed semi-structured questionnaire schedule was prepared in local language. A thorough history and detailed general, otolaryngological, neurological, ophthalmological examination was done. Specimens were also collected. The child having bleeding diathesis, cardiac disease, anemia, acute infection, poor anesthetic risk, or an uncontrolled medical illness that prevents tonsillectomy were excluded from the study along with Presence of criteria for rheumatic heart disease and rheumatic fever.<sup>[12,13]</sup>

The study population was divided into two groups:

- Group X : the patients who underwent tonsillectomy.  
Group Y : 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 3 and 6 months after the tonsillectomy and long-acting penicillin treatment.

ASO Titre: the patient should be fasting for 6 h before the test. The enzyme-linked immunosorbent assay technique was used to determine the serum ASO Titre.

ESR: the patient should be fasting for 6 h before the test

## RESULTS

This study included 100 patients, of which 50 % were girls and 50% were boys. The distribution of the studied population according to the age group was as follows: 40 patients were between 5 and 8 years of age, 34 were 9-12 & 26 were 12–15 years. The mean age was 8 years (SD=3.04) .The frequencies of

occurrence of fever, cough, obstructive sleep apnea, unequal tonsil size, and pus in the tonsillar crypts were 80% , 51 % , 4% , 52% , and 48 % , respectively. The mean ESR levels after 3 months were found to be higher in patients treated by tonsillectomy than in those who were treated with long-acting penicillin; however, the difference between both the groups was found to be statistically non significant (P-value=0.084) . In the present study, the preintervention ESR and ASOT were determined for all the patients (N=100). As regards ESR, the minimum reading was 28 mm/h, whereas the maximum reading was 69 mm/h (mean=45.3350 mm/h). As regards ASOT, the minimum reading was 401.00, whereas the maximum reading was 659.00 (mean=522.4950). The mean ESR levels after 6 months were found to be higher in patients treated by tonsillectomy than in those who were treated with long-acting penicillin; however, the difference between both the groups was found to be statistically non significant (P-value=0.24). By comparing the effect of tonsillectomy versus the effect of long-acting penicillin on ASOT, we found that the levels after 3 months were lower in patients who were 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=0.02). 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=0.033). In the tonsillectomy group, the ASOT was 200 IU/ml or less in 80%, greater than 200–400 IU/ml in 12 % , and greater than 400 IU/ml in 8 % . In contrast, in the penicillin-treated group, the ASOT was 200 IU/ml or less in 35 % , greater than 200–400 IU/ml in 45 % patients, and greater than 400 IU/ml in 20 % 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=0.032). The effect of the treatment either with tonsillectomy or long-acting penicillin on the minimum and maximum readings of both ESR and ASOT illustrate that ESR rapidly decreases before the ASOT response. In the group treated by tonsillectomy, we observed that the mean readings of ESR progressively declined from 45.28 mm/h before management to 22.36 mm/h after 3 months and then to 7.41 mm/h after 6 months; in the other group treated with long-acting penicillin, the mean readings of ESR progressively declined from 45.39 mm/h

before management to 14.98 mm/h after 3 months and then to 6.48 mm/h after 6 months; there is no significant difference between both the groups (P-value=0.122). In the group treated by tonsillectomy, the mean readings of ASOT declined from 518.29 IU/ml before management to 253.28 IU/ml after 3 months and then to 117.13 IU/ml after 6 months. We 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 413.39 IU/ml after 3 months and then to 262.98 IU/ml after 6 months. We estimate that 24% of patients did not reach the normal range after 6 months of treatment with long-acting penicillin.

## DISCUSSION

This Prospective study was conducted among 100 children aged 5–15 years presenting in the Department OPD & rural health centre of Raipur Institute of Medical Sciences , Raipur. Tonsillectomy is the most frequently performed otolaryngological procedure, especially in young children. The most common indication for tonsillectomy is recurrent bacterial tonsillitis. The effectiveness of tonsillectomy has been questioned in a 2009 systematic review of 7765 papers that were published in the journal of Otolaryngology – Head and Neck Surgery. The study showed that it was most likely not effective all the time, but rather was modestly effective, and not a single paper reported that tonsillectomy is invariably effective in eliminating sore throats. 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. On comparison with other studies, we found that, Motta et al. estimated that ASOT levels become normal in 69.8% of patients, 2 years after tonsillectomy. <sup>[14]</sup> 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 our study compared with the long-term follow-up (2 years) for patients in the study by Motta et al. <sup>[14]</sup> A study estimated that ASOT levels were found to be normal in 36 patients (72%) and high in 14 (28%); accordingly, the ESR levels were found to be normal in 18 patients (36%) and high in 32 (64%), 2 years after tonsillectomy. <sup>[15]</sup> 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 our study compared with the long-term follow-up (2 years) for patients in the study.<sup>[15]</sup> The main problem we 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-phase reactants in recurrent tonsillitis. The overall awareness regarding problems was poor in patients.

## CONCLUSION

This study presents important insight into the alternate treatment regimens of Recurrent Tonsillitis in rural children. 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. These findings can be used to plan future strategies for health education interventions in the community. There is a need to take immediate measures for prevention and control of recurrent tonsillitis. Awareness campaigns about the common causes, complications and correct practices are recommended. This study and its results are applicable to the geographical and socioeconomic status around our Medical Institute.

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