



Original Research

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## A NEW TREATMENT MODALITY TO REDUCE ACUTE TONSILLITIS HEALING TIME

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### ABSTRACT

#### Background and Objective

Acute tonsillitis is one of the most common reasons for application to otorhinolaryngology clinics. In the treatment of acute tonsillitis, supportive therapies are mostly used. As antibiotic therapy, penicillin or erythromycin can be used. The aim of this study is to decrease the clinical recovery time of acute tonsillitis by providing parenteral treatment and daily cleaning of tonsillar lesions.

#### Material and Methods

Patients with an age range of 15–60 years were included in the study. The patients were divided into two groups. The first group used an i.v. combination of ampicillin + sulbactam and the tonsillar membranes of patients were cleaned daily. The second group used only the i.v. combination of ampicillin + sulbactam.

#### Results

Patients who received antibiotherapy and debridement had a clinical improvement of 90% on the 2nd treatment day and 95% on the 5th treatment day. The patients receiving only antibiotics had a clinical improvement of 65% on the 5th treatment day and 75% on the 7th treatment day. The recovery time of both groups was significantly different ( $p < 0.05$ ).

#### Conclusion

The solution and technique used in this clinical study showed that patients with acute tonsillitis could recover in a very short time without any complications.

**Keywords:** *acute tonsillitis, treatment, healing time, recovery, otorhinolaryngology*

## INTRODUCTION

Acute tonsillitis is one of the most common reasons for application to otorhinolaryngology clinics. The infectious factors of acute tonsillitis have been shown in detail in previous studies (1). Viral agents are responsible for 50–80% of all acute tonsillitis. Viral infections are frequently caused by rhinovirus, coronavirus, and parainfluenza virus. Rarely, unusual organisms such as herpes simplex virus can be detected. In addition, the Epstein–Barr virus (EBV) is responsible for approximately 1–10% of all cases (also called mononucleosis or glandular fever) (1). EBV also causes contagious infections. The most common bacterial microorganisms causing acute tonsillitis are A group beta-hemolytic *Streptococci* (most frequent), *Chlamydia pneumoniae*, *Mycoplasma pneumoniae*, *Haemophilus influenzae*, *Candida*, *Neisseria meningitis*, and *Neisseria gonorrhoeae* (2). The treatment of viral tonsillitis depends on the symptoms. However, the treatment of bacterial tonsillitis is directed to the bacterial agent.

The symptoms of acute tonsillitis are sore throat, headache, fever, malaise, muscle and joint pain, and swallowing difficulty (3). In viral tonsillitis, fever continues as sub-febrile. In bacterial tonsillitis, fever becomes apparent. On physical examination, tonsil hypertrophy and hyperemia are usually seen. In young and adult patients, there may be white or gray membranes on tonsils.

Nowadays, in the treatment of acute tonsillitis, supportive therapies (analgesic therapy and corticosteroid therapy) are mostly used (4, 5). As a first option of antibiotic therapy, penicillin is generally used. If there is an allergic situation, erythromycin or second-generation cephalosporin can be used (6, 7). The risk of transmission can reduce in 24 hours after the use of antibiotics (8). The recovery period of acute tonsillitis does not change with different antibiotic use (9). The average healing time varies between 7 and 14 days. This causes long-term parenteral medication and

prolonged hospital stay. It is necessary to shorten the length of stay in otorhinolaryngology clinics with clinical improvement and increase the quality of life of the patients in a short time. We hypothesize that the membranes on tonsils should be cleaned daily to decrease the clinical recovery time.

The aim of this study is to accelerate the clinical recovery by providing parenteral treatment and daily cleaning of tonsillar lesions in patients with acute tonsillitis who are admitted to the otorhinolaryngology clinics.

## METHODS

### *Study period*

This study was conducted in Nigde Bor State Hospital in Turkey between February 2017 and February 2019.

### *Sample and design*

The patients with acute tonsillitis who were admitted to the Department of Otolaryngology Clinic in Nigde Bor State Hospital in Turkey were included in the study.

The inclusion criteria were as follows: an age range of 15–60 years, grade 2–3 tonsil hypertrophy, exudation and membrane formation on tonsils, fever ( $>37.3^{\circ}\text{C}$ ), severe weakness, no previous oral antibiotic use, and difficulty in breathing and speaking. In addition, throat swab samples were taken from the tonsils of the patients and sent to the microbiology laboratory. A rapid antigen detection test (Strep A Optical Immune Assay [BioStar]) was studied.

It was decided to give intravenous antibiotics to the patients who were positive, and so they were hospitalized. Rapid antigen test negative patients were given outpatient symptomatic treatment, and these patients were not included in the study. Other swab samples taken from the patients were incubated in sheep blood agar for 48 hours at  $37^{\circ}\text{C}$ . The culture plates were checked every 24 hours. Culture positive patients were noted.

The exclusion criteria were as follows: a history of tonsillectomy, presence of a peritonsillar abscess (PTA), children under 15 years of age, a history of antibiotic allergy with penicillin group, and patients previously treated for acute tonsillitis.

All patients were examined by an experienced otolaryngologist. Patients' histories were noted. Patients who fulfilled the inclusion criteria were randomly included in the study. Participants were randomly assigned following simple randomization procedures (computerized random numbers) to one of the two treatment groups. Patients who did not meet the inclusion criteria were treated in accordance with the treatment guidelines.

The patients were divided into two groups. The first group used an i.v. combination of ampicillin + sulbactam and the tonsillar membranes were cleaned daily. The second group used only the i.v. combination of ampicillin + sulbactam.

The number of patients included in the first group was 107. The number of patients included in the second group was 98.

#### ***Preparation of tonsillar cleaning apparatus***

To clean the membrane on the tonsils, cotton and sponge on a long curette tip were prepared with 0.5 × 0.5 cm dimensions.

#### ***Preparation of tonsillar cleaning solution***

The prepared solution contained the herbal extracts commonly used in the community. In addition, the contents and proportions of the mixture were determined according to the effectiveness and tolerability of the patients. The herbal extracts in the mixture had no toxic effects for the dose used.

The content of the mixture was as follows for 100 cc:

1. Sodium bicarbonate: 30 cc (50% saline)
2. Mentha piperita: 7 cc
3. Ocimum basilicum: 7 cc
4. Cichorium intybus: 7 cc

5. Astragalus gummifer: 7 cc
6. Carthamus tinctorius: 7 cc
7. Povidone iodine: 20 cc
8. Ethyl alcohol: 15 cc

#### ***Application of the solution and cleaning of tonsillar membranes and exudates***

The procedure was performed by an experienced otolaryngologist. The mixture was shaken before use. It was soaked with the previously prepared cotton swab. For both tonsils, the membranes, exudate, and crypts were removed. Then, the solution was applied to the surface of cleaned tonsils. Oral intake of the patients was limited for 15 minutes. It was informed not to swallow the solution.

When the debridement was performed, significant care was taken not to stimulate the pharyngeal reflex. In this way, the patient was able to tolerate the procedure. After the procedure, we did not see any complications. Only three patients had vomiting after the procedure.

In order to evaluate the response of the patients to the treatment, the Sore Throat Life Quality Scale (STQoL) was used (10). The scale was adapted to Turkish and applied to patients. It is a valid scale for evaluating patients with acute tonsillitis for measuring the quality of life. With this scale, the patient can be evaluated in three different ways: social, physical, and environmental. The questionnaire includes 21 questions and is rated from 1 to 5. Five possible answers are offered for each statement, in the form of Likert's scale: "not at all," "a little," "medium," "a lot," and "extremely." The answers are rated from 5 ("not at all") to 1 ("extremely").

All patients included in the study filled the questionnaire before starting the treatment. The questionnaire was repeated on the 2nd, 5th, and 7th days after the treatment. The mean scores of the questionnaire were compared separately for each group.

### Sample Size

According to the power analysis, for a study design with 0.05 type I error, 80% power, and a standard effect size of 0.41, a minimum of 93 subjects in each group was found to be required.

### Statistical Analysis

Standard deviation, mean, median, lowest, highest, frequency, and ratio values were utilized in the descriptive statistics of the data. Categorical variables were compared with the chi-square test. The distribution of the variables was assessed with the Kolmogorov–Smirnov test. Independent sample *t*-test and paired sample *t*-test were used for the analysis. The analysis of data is made use of with SPSS 21.0 program.

### Ethical Approval and Reference Number

This study was conducted in accordance with the Declaration of Helsinki, and the ethics committee approval was obtained from Adana City Hospital in Adana, Turkey. The reference number is 93/2018. Patients included in the study were informed and consent forms were obtained.

## RESULTS

A total of 205 patients were included in the study. Demographic data are explained in Table 1.

The age range of the patients was 15–60 years. The first group included 107 patients, and the second group included 98 patients. The sex distribution in the first group was 54 females and 53 males, and in the second group, it was 46 females and 52 males.

There was no significant difference in the STQoL mean scores of all patients before treatment ( $p > 0.05$ ) (Table 2). The STQoL scores significantly increased compared to the pretreatment scores in Group I ( $p < 0.05$ ) (Indicates that the disease is healed rapidly) (Table 2).

On the 2nd and 5th day after treatment, there was no significant increase in the STQoL score in Group II ( $p > 0.05$ ). On the 7th day, the STQoL scores significantly increased in Group II ( $p < 0.05$ ).

On the 2nd, 5th, and 7th day after treatment, the mean STQoL score of Group I was significantly higher than the mean STQoL score of Group II.

**TABLE 1** Demographic Variables and Clinical Characteristics of the Sample

		Group I		Group II		p*
		Mean ± SD/N%	Median	Mean ± SD/N%	Median	
Age		40.4 ± 15.3	38.0	41.5 ± 14.8	39.0	0.624
						p**
Gender	Male	53 / 49.5%		46 / 46.9%		0.316
	Female	54 / 50.5%		52 / 53.1%		

\*Independent sample *t*-test was used. \*\*Chi-square test was used.

**TABLE 2** The Comparison of Group I and Group II STQoL Scores

		Group I	Group II	p*
		Mean ± SD	Mean ± SD	
STQoL	Before treatment	25.7 ± 4.3	27.3 ± 4.5	0.821
	After treatment (2nd day)	58.2 ± 8.4	33.1 ± 5.2	0.038
	After treatment (5th day)	76.5 ± 13.2	40.4 ± 8.3	0.021
	After treatment (7th day)	92.4 ± 16.7	67 ± 12.5	0.032

\*Independent sample *t*-test was used. Paired sample *t*-test was used.

## DISCUSSION

If acute tonsillitis is not treated effectively in a short period, it will become chronic and cause various complications (11). Therefore, it is effective to start treatment immediately. With appropriate antibiotic therapy, acute bacterial tonsillitis can usually heal without developing any complications within 7–10 days (12). However, the antibiotic given for this should be appropriate, the patient should use the drugs regularly, and the patient should not be in a state of immunosuppression. These conditions are not considered in the current treatment guidelines (13).

The prevalence of antibiotic consumption, especially in our country, prevents the treatment of many infections such as acute tonsillitis in a short time (14). In addition, according to our clinical observations, the development of complications is inevitable, especially in young and adult patients, without appropriate treatment methods. The accepted duration of antibiotic treatment is approximately 10 days (9). However, most patients do not complete this period. The patients with complications are hospitalized and treated parenterally (15).

Our hypothesis is the basis of this study. If the area of infection is mechanically removed, clinical recovery time will improve. Therefore, parenteral treatment was started in all patients included in our study. The combination of ampicillin + sulbactam was started. This combination has proven effective in all patients. Unlike, in patients who underwent tonsillar local debridement, recovery time was shortened, and quality of life increased in a short time.

It is very important to prevent acute tonsillitis complications, because complication development increases morbidity and mortality. The most common complication is PTA. In addition, the parapharyngeal abscess (PPA) may develop a retropharyngeal abscess (RPA) as a result of the spread of infection to the hypopharynx (16, 17). The most serious complication is necrotizing

fasciitis (NF) which can progress very rapidly (18). This may lead to mortality. Treatment of these complications is surgery (19). This causes great sociopsychological problems for the patient.

PTA, PPA, RPA, or NF did not develop in any of the patients included in our study. Patients who received antibiotherapy and debridement had clinical improvement of 90% on day 2 and 95% on day 5. Patients receiving only antibiotics had a clinical improvement of 65% on day 5 and 75% on day 7. The recovery time of both groups was statistically significant ( $p < 0.05$ ).

This article should be considered with its limitations. A major limitation is that the STQoL is not validated in Turkish. The scale was adapted to Turkish and applied to patients by the authors. Another limitation is the lack of a placebo group. Including a placebo group would improve the findings of the study.

## CONCLUSIONS

As a result, the solution and technique used in this clinical study showed that patients with acute tonsillitis could recover in a very short time without any complications. Thus, complications can be prevented. Although i.v. antibiotic treatment is effective, the recovery period is long. However, future placebo-controlled studies are needed to clarify these findings.

## AUTHORS' CONTRIBUTIONS

H.K. was responsible for the concept, literature, design, data collection, and manuscript writing. O.G. was responsible for the literature, analysis, interpretation, and manuscript writing.

## CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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