THE MEDICAL BULLETIN OF
SISLI ETFAL HOSPITAL

DOI: 10.14744/SEMB.2018.01336
Med Bull Sisli Etfal Hosp 2020;54(2):201–205

Original Research

Are Symptoms Sufficient in the Decision to Start Antibiotics in Tonsillopharyngitis?

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Abstract

Objectives: Unnecessary use of antibiotics is one of the causes of antibiotic resistance. Rapid Antigen Test (RAT) is recommended to prevent unnecessary use of antibiotics by providing bacteria/virus isolation in patients with tonsillopharyngitis. However, in patients with typical symptoms, false-negative test results may lead to doubt in doctors. In this study, we aimed to evaluate the relationship between patients' symptoms and RAT results.

Methods: In this study, we chose the patients that referred to the University of Health Sciences (SBÜ) Şişli Hamidiye Etfal Training and Research Hospital Family Medicine Polyclinics and got a diagnosis of tonsillopharyngitis with RAT. This study was conducted by a retrospective file scanning method. We examined the age, sex, symptoms, RAT results and throat culture results of the patients. SPSS 15.0 for Windows program was used for the statistical analysis. The level of statistical significance was accepted as $p<0.05$.

Results: In this study, the RAT of 265 patients and the throat culture of 141 patients were examined. We found RAT positivity as 28.7%, Group A Beta Hemolytic Streptococcus (AGBHS) detection rate in throat culture was 22.5%, and the antibiotic prescription rate was 37%. There were 32 patients with AGBHS positivity in throat culture. Twenty-seven of them got RAT positivity, too. When symptoms and RAT positivity were examined, there was no significant relationship between RAT positivity and fever higher than 38 °C, but RAT was more often positive in patients with a fever higher than 38 °C. On the other hand, there is a statistically significant relationship between RAT positivity and the presence of tonsillar exudate ($p=0.000$). When the relationship between symptoms and RAT according to age groups was examined, the presence of LAP and tonsillitis were significant ($p=0.000$; $p=0.001$). In the age group of 18 years and over, the presence of tonsillar exudates was significant ($p=0.001$).

Conclusion: In our study, tonsillar exudate was a common symptom in both age groups of <18, and ≥18 years of age; at the same time, there is a statistically significant relation with RAT. Tonsillar exudates are not seen only in bacterial infections but also in viral infections. Thus, we think that antibiotics should not be started based on symptoms, and RAT should be used effectively.

Keywords: Antigens; diagnosis; pharyngitis; streptococcal infections; tonsillitis.

Please cite this article as "Esen ES, Egici MT, Öztürk GZ. Are Symptoms Sufficient in the Decision to Start Antibiotics in Tonsillopharyngitis?. Med Bull Sisli Etfal Hosp 2020;54(2):201–205".

Tonsillopharyngitis is an acute inflammation of the pharynx, tonsilla palatina, or both. Among its symptoms, sore throat, difficulty in swallowing, cervical lymphadenopathy and fever are included.[1] The diagnosis is made through clinical findings, throat culture and rapid antigen test (RAT). The most important reasons for applying to primary health care institutions are upper respiratory tract infections (URTsI), including acute tonsillopharyngitis.

Many bacterial and viral agents are the causes of tonsillopharyngitis, but the most common pathogenic agents are viruses.

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Submitted Date: September 06, 2018 **Accepted Date:** October 19, 2018 **Available Online Date:** June 10, 2020

The most important cause of bacterial tonsillopharyngitis is Group A Beta Hemolytic Streptococci (GABHS), which is responsible for approximately 15-20% of all cases of tonsillopharyngitis.[2, 3] According to the Turkish Statistical Institute data concerning the year 2016, upper respiratory tract infections account for 42.6% of major childhood diseases experienced by children aged 0-6 years within the previous six months.[4]

According to a study conducted in Turkey, 11.86% of prescriptions are written by family physicians because of the diagnosis of the acute tonsillopharyngitis, 79.58% of the prescription antibiotics are written for acute tonsilopharyngitis.[5]

The reason why GABHS tonsillopharyngitis is so important is that it may lead to the development of complications, such as acute rheumatic fever (ARA), peritonsillar abscess, and poststreptococcal glomerulonephritis. The worldwide prevalence of ARA ranges between 9.5-18/100000 and 80-508/100000.[6] Given that ARA can be prevented with the correct treatment is one of the reasons why many physicians prefer antibiotics in tonsillopharyngitis. However, today's increase in antibiotic resistance has led to the need to limit the use of antibiotics. The important distinction here is the cause of tonsillopharyngitis. RAT is a rapid practical test used in discrimination between virus, and bacteria and restricts the use of unnecessary antibiotics.[7]

Unnecessary use of antibiotics is an important cause of antibiotic resistance. Antibiotic resistance is a problem affecting the whole world today. According to the Centers for Disease Control (CDC), in the USA, 2 million people are infected with antibioti-resistant bacteria every year and 23,000 of them die.[8] World Health Organization has strategies to combat antibiotic resistance, which is also implemented in our country. As of January 15, 2017, the implementation of RAT has been started in primary health care institutions.

In this application, the patient who comes with a complaint of sore throat is evaluated according to the Centor criteria, and then RAT is started to be performed for the patient who scores 2 or more according to the result of the Centor scoring system.

Use of RAT is recommended by the Infectious Diseases Society of America and although it has high sensitivity and specificity;[9] it brings on concerns about delaying antibiotherapy among physicians due to its false-negative results; therefore, in patients with typical symptoms, antibiotics can be started even if the RAT result is negative.

In our study, we aimed to evaluate the relationship between RAT results and symptoms.

Methods

This study was performed with the approval of the Istanbul Sisli Hamidiye Etfal Training and Research Hospital, University of Health Sciences Clinical Research Ethics Committee (07.03. 2018; number, 2037). Since tonsillopharyngitis was most frequently seen during autumn and winter months (10), the patients applied to Family Medicine Policlinics of Istanbul Sisli Hamidiye Etfal Training and Research Hospital between 09.01. 2017 and 03.30.2018 with the diagnosis of tonsillopharyngitis for whom RAT was requested was included in our study. In our clinic, the symptoms of the patients with a sore throat were entered into the hospital information processing system to be evaluated according to the Centor criteria.

Centor Criteria

Centor criteria are used as a clinical scoring method used for differentiation between viral and bacterial tonsillopharyngitis. Scoring is performed based on Centor criteria, which include the presence of fever over 38 ºC, lack of cough, presence of tonsillar hypertrophy and/or exudate, sensitive cervical lymphadenopathy (LAP).[11] Each point increase in score increases the risk of streptococcal infection. The risk of contracting streptococcal infection is 1-2% at zero, 5-10% at one,11-17% at two, 28-35% at 3, and 51-53% at ≥4 points.[3]

According to the results of the Centor scoring system, RAT is applied to the patient who scores ≥2 points.

RAT/Throat culture

After the tongue is pressed down with a tongue depressor, the swab is applied to both tonsils, posterior pharynx and inflamed areas (if any) to obtain samples that are sent to the laboratory for incubation in culture media or rapid antigen test.

In our study, the data of these patients were scanned using the retrospective file scanning method, and age, gender, symptoms of patients, and RAT and culture results were recorded.

Statistical Analysis

SPSS 15.0 for Windows program was used for statistical analysis. Descriptive statistics were given as numbers and percentages for categorical variables. In independent groups, rates were analyzed using chi- square test. When parametric test conditions could not be met in multi-eyed tables, Monte Carlo simulation was applied. Dependent group analyzes were performed using the McNemar test. The statistical alpha significance level was accepted as $p<0.05$.

Results

Between above-mentioned specified dates, a total of 20.671 patients applied to our outpatient clinic, and 772 of them were diagnosed with tonsillopharyngitis. RAT and throat cultures were requested from 265, and 141 patients, respectively (Fig. 1). In our study, data of 265 patients for whom RAT were requested were analyzed and included in this study (Table 1). The mean age of the patients was 22.77±14.22 years, and 102 (38.5%) cases aged between 3-18 years. Hundred and forty patients (52.8%) were male and any relationship was not found between age and gender (p>0.05).

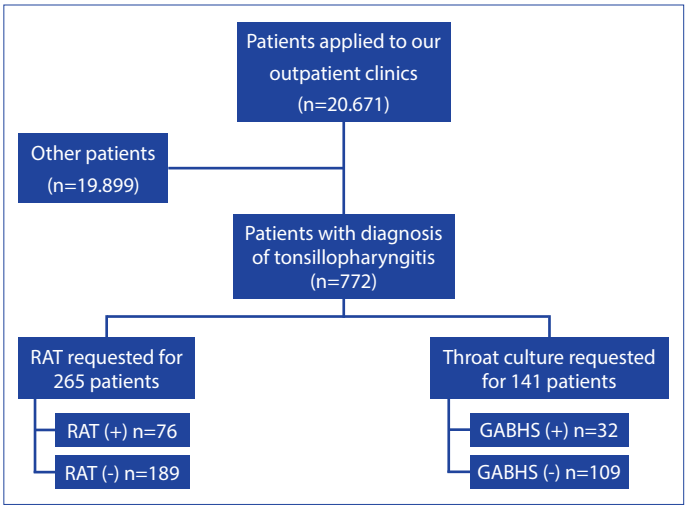

Figure 1. Data obtained.

Table 1. Demographic, clinical, and laboratory data of the patients included in this study

	n	%
Age		
<18 years	102	38.5
≥18 years	163	61.5
Gender		
Female	125	47.2
Male	140	52.8
Symptoms		
Fever >38 ºC	143	54
Tonsillar exudate	168	63.4
LAP	86	32.5
Lack of cough	156	58.6
Rapid antigen test		
Negative	189	71.3
Positive	76	28.7
Throat culture		
No	124	46.8
Yes	141	53.2
Throat culture		
Normal	109	77.3
Group A Beta Hemolytic Streptococci	32	22.7
Treatment		
Untreated	23	8.7
Symptomatic treatment	144	54.3
Antibiotherapy	98	37

A total of 772 patients diagnosed with tonsillopharyngitis between the relevant dates constituted 3.73% of all our patients. RAT positivity was found in 28.7% of the patients, and GABHS was isolated in throat cultures of 22.5% of the patients. Despite this, antibiotherapy was prescribed for 37% of the patients. The least common symptom was LAP positivity. When examined concerning symptoms, fever and tonsillar exudate were statistically significantly more often seen in the group under age 18 when compared with a group of patients aged 18 and older (p=0.000; p=0.000) (Fig. 2).

RAT positivity was seen in 38.1% (n=37) and 23.2% (n=39) of the patients in the groups of patients aged <18, and ≥18 years, respectively with a statistically significant intergroup difference (p=0.010). As the age of the patients increases, the number of cases with negative RAT results increases significantly (p=0.043). Although RAT positivity rates were higher in women relative to men, there was no significant relationship between gender and RAT positivity. When the symptoms and RAT positivity were examined one by one, no significant relationship was found between the presence of fever over 38 ºC and RAT positivity, and there was a relationship with other symptoms. As seen in Table 2, there is a significant relationship between the presence of tonsillar exudate and RAT positivity (p=0.000).

When the symptoms and throat cultures were compared, any relationship between the presence of fever and throat culture was not detected. In culture- negative cases, cough and LAP were more frequently seen (p=0.029; 0.046). Ton-

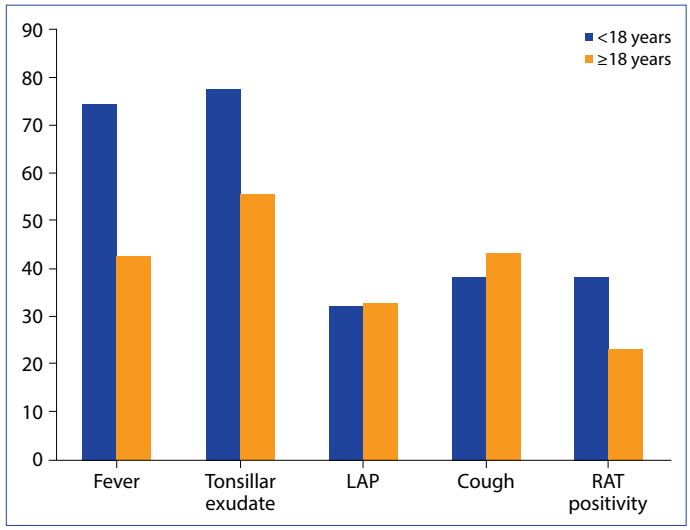

Figure 2. Comparisons between symptoms, and RAT results in patients aged <18, and ≥18 years.

Table 2. Relationship between symptoms, results of rapid antigen test, and cultures

	Rapid Antigen Test Positive		Rapid Antigen Test Negative		p
	n	%	n	%	
Tonsillar exudate					
Yes	66	86.8	102	54	0.000
No	10	13.2	87	46	
LAP					
Yes	32	42.1	54	28.6	0.033
No	44	57.9	135	71.4	
Cough					
Yes	22	28.9	87	46	0.011
No	54	71.1	102	54	
Fever >38 ° C					
Yes	48	63.2	95	50.3	0.057
No	28	36.8	94	49.7	

sillar exudate was significantly more often observed in throat culture- positive cases (p=0.003). However, when the relationship between symptoms and RAT results was divided into two age groups, there was a significant relationship between RAT positivity and the presence of LAP and the presence of tonsillar exudate in the group under 18 years of age (p=0.000; p=0.001). A significant relationship was found between RAT positivity and tonsillar exudate in patients aged 18 and over (p=0.001).

Discussion

Tonsillopharyngitis is one of the most common diseases in primary care. Tonsillopharyngitis is a disorder that affects mostly the pediatric age group. It is most frequently seen between the ages of 5-15.[12] The mean age of the patients in our study was 22.77±14.22 years, which is because family medicine physicians serve all age groups.

In a study in which throat cultures were examined, GABHS infections were found to be higher in men.[13] In our study, there was no significant relationship between gender, and RAT, and throat culture positivity.

In our study, we found that RAT positivity was significantly higher under the age of 18 and that RAT positivity decreased with increasing age. Because viruses are pathogenic agents in 90% of the cases with tonsillopharyngitis in adults, but only in 60-75% of pediatric cases.[14]

While the detection rate of GABHS in the literature ranges between 5-10% in adults, it was 22.7% in our study.[15] The antibiotic prescription rate was 37%, which is similar to the 2013 surveillance report.[4] In one study, 21% of the patients with positive cultures were untreated, while 47% of the patients with negative cultures were administered treatment.[16] In our study, 25% (n=8) of the patients with positive cultures were not treated; Antibiotics were administered to 12.8% of the patients with negative culture results. One of the reasons for these treatments incompatible with the laboratory results may be that physicians start treatment according to the patient's clinic without waiting for the results of the culture.

In one study, 56% of the cases with streptococcal pharyngitis sore throat, fever, LAP and tonsillar exudate were detected.[17] Studies comparing symptoms with RAT and culture results have been performed. For instance, Steinhoff et al. found a significant relationship between the patients with positive throat cultures and tonsilar exudate, fever over 38 ºC, and palpable lymph glands.[18] Nandi et al.[19] detected a relationship between tonsillar growth, hyperemia, and palpable lymph node. Similarly, in our study, the presence of LAP and tonsillar exudate were found to be significant in RAT- positive cases under the age of 18. However, the presence of tonsillar exudate was found significant as for RAT positivity in cases aged ≥18 years.

In our study, the detection of tonsillar exudate on physical examination in our study with both adults and children is a common symptom for RAT positivity. Although it was concluded in their study that "tonsillar hypertrophy should seriously suggest the initiation of empirical antibiotherapy",[20] according to another study, the sensitivity and specificity of antibiotherapy were reported to range 55-74% and 58-76%, respectively.[19] Therefore, we think that the initiation of antibiotherapy should not be decided based on symptomatology alone.

Conclusion

As a common symptom, tonsillar exudate was found to be statistically related to RAT positivity in groups of patients aged <18, and ≥18 years. On the other hand, since tonsillar exudate occurs not only in bacterial infections but also in viral infections, we think that antibiotherapy should not be started based on symptoms alone. In our study, there was a strong harmony between RAT and throat culture. The use of RAT is recommended to reduce unnecessary use of antibiotics by distinguishing bacterial viruses in all applications, especially in family medicine polyclinics.

Disclosures

Ethics Committee Approval: Istanbul Sisli Hamidiye Etfal Training and Research Hospital, University of Health Sciences Turkey Clinical Research Ethics Committee (07.03.2018; number, 2037).

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept – E.S.E., M.T.E., G.Z.Ö.; Design – G.Z.O., M.T.E., E.S.E.; Supervision – M.T.E., G.Z.O., E.S.E.; Materials – E.S.E., M.T.E., G.Z.Ö.; Analysis and/or interpretation – G.Z.O., E.S.E., M.T.E.; Literature search – E.S.E., M.T.E., G.Z.Ö.; Writing – E.S.E., M.T.E., G.Z.O.; Critical review – M.T.E., E.S.E., G.Z.Ö.

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