Antibiotic Use in Sore Throat: Are We Judicious?

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Abstract *Introduction* Sore throat (acute tonsillitis/pharyngitis) is one of the most common clinical diagnosis encountered in ENT practice. It is a common practice to advice antibiotics in patients of sore throat not only in otolaryngology practice but also in pediatricians, GP's and internists. This is now becoming a matter of concern for two reasons, for the side effects of antibiotics and bacterial drug resistance. *Methods* To analyse patients on their symptoms and rapid streptococcal test for group A *Streptococcus* and determine antibiotic use. A prospective study was done in 600 patients who were clinically diagnosed as acute tonsillitis or acute pharyngitis and results analysed. *Discussion* Results showed that 24 % patients needed antibiotics while the rest did well without antibiotics. *Results* Rapid streptococcal test is a useful test in determining whether the patient needs antibiotic and help is reducing irrational use of antibiotics.

Keywords Rapid streptococcal test · Group A *Streptococcus* · Antibiotic resistance

Abbreviations

RST Rapid strep test

GAS Group A *Streptococcus* (β haemolytic)

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Introduction

Acute tonsillitis/pharyngitis is one of the most common diagnosis encountered in ENT practice. It is also common condition seen by general practitioners, pediatricians and internists. Majority of cases are caused by viruses and only a small amount are caused by Group A *Streptococcus* (GAS) (β haemolytic/ β HSA) [1, 2]. Still, antibiotics are routinely prescribed in almost every case [3]. This is of concern regarding the increasing resistance for antibiotics in clinical practice and side effects [4, 5].

Materials and Methods

A prospective study of 600 patients analysed between 1st January, 2014 and 31st October, 2014 at a secondary level hospital in the United Arab Emirates. The age group were 6–60 years and the criteria used to analyse symptoms was the Centor Criteria [6]. Various other office scales have been described in literature [7]. Any patient fulfilling the inclusion criteria was evaluated on the following scale (1 point for each of following).

- Fever $> 38.5^{\circ}\text{C}$
- Whitish membrane on throat/exudative tonsillitis
- Anterior cervical LN enlargement/tenderness
- Absence of cough
- Age < 15 years

(subtract 1 if age more than 45 years)

Exclusion criteria was patient receiving or received antibiotic(s) in previous week, established Rheumatic fever, high risk cases like cardiac valvular lesions, diabetics, pregnancy and post-splenectomy, haematological malignancy patients and patients on dialysis/renal

failure, admitted in ICU for any condition and immunocompromised.

A rapid test for identification of GAS was done [8]. It is a simple test and can be done as a quick out patient procedure. The patient's throat is first swabbed to collect a sample. The swab should be rubbed thoroughly over the tonsils/pharynx and best if a small piece of exudate comes on the swab. In most RSTs, this mucus sample is then exposed to a reagent containing antibodies that will bind specifically to a GAS antigen (lateral flow test). Sensitivity of the test is 95 % and specificity is 98 % as claimed by the manufacturer. Time taken for this test is approximately 7 min and the patient wait time (in out patient documented was <20 min). Written consent was taken from all patients to be included in the study. RST was done on patients and the results analysed. If RST was positive patients were prescribed Co-amoxiclav (or alternately, Clarithromycin, if allergic to penicilins). If the results were negative patients were treated symptomatically with pain killers and culture done [9].

Follow up was done at 5 days in out patient and telephonic on the 10th day. Symptoms were assessed using the earlier criteris (Centor criteria) and resolution of fever, anterior cervical lymphadenopathy, tonsillar exudate was considered as relieved.

Observations

Out of 600 patients, age distribution is given in Table 1. There were 342 (57 %) males and 258 (43 %) females. Out of 600 patients 54 (9 %) had Centor criteria of four or more who were prescribed antibiotics and supportive measures straight away. Out of the remaining 546 (91 %) patients, RST was done and was found to be positive in 78(13 %) patients who were prescribed antibiotics. The remaining patients, throat culture was done and prescribed an antibiotic only if the culture was positive.

12 (2 %) patients out of the remaining (468) were found to be culture positive (2 GAS and 10 other bacteria) and result informed to patient by telephone and started on antibiotic based on sensitivity (Tables 2, 3, 4).

Table 1 Age distribution of patients

Age (in years)	Number of patients (%)
6–15	236 (39.3)
16–25	124 (20.6)
26–35	108 (18)
36–45	97 (16.2)
>45	35 (5.8)

Table 2 Patient distribution as per Centor criteria and RST

	Number of patients (%)
Centor criteria ≥ 4	54 (9)
RST positive	78 (13)
RST negative, culture positive	12 (2)
RST negative, culture negative	456 (76)

Table 3 Antibiotics prescribed

	Number of patients (%)
Antibiotics prescribed	144 (24)
Not prescribed	456 (76)

Table 4 Relief in symptoms and reduction of morbidity after treatment

	Relieved (%)	No relief (%)
Antibiotic group	135 (22.5)	9 (1.5)
Non Antibiotic group	433 (72.2)	23 (3.8)

In patients who had no relief, in antibiotic group, changing the antibiotic helped and in non antibiotic group increasing the analgesia helped.

Discussion

The prevalence of multidrug-resistant bacteria has been increasing at an alarming rate [10, 11] and especially in pediatric practice. They are seriously undermining the value of antibiotics in clinical medicine. Antibiotics are being used as first line therapy for acute tonsillitis/pharyngitis. There are many well defined protocols which are simple and easy to be followed like the American Association of Family Physicians [12]. The rational approach should be as follows: The patients are first analysed

Fig. 1 Rapid streptococcal test kit

Fig. 2 American association guidelines for antibiotic use in sore throat

as per Centor Criteria. Thereafter, patients who are Centor criteria ≥ 4 , were prescribed antibiotic straight away since the risk of GAS in these patients is high (52–87 %). The remaining were subjected to RST as described above. 54 patients (9 %) were in score 4 or more and hence antibiotics were prescribed straightaway. In these cases the risk of GAS is about 51–63 %. The remaining patients were subjected to RST (Figs. 1, 2).

The patient's throat is first swabbed to collect a sample. This is the most crucial step; and a properly swabbed sample can avoid a range of false negatives. The swab should be rubbed thoroughly over the tonsils/pharynx and best if a small piece of exudate comes on the swab. In most RSTs, this mucus sample is then exposed to a reagent containing antibodies that will bind specifically to a GAS antigen. A positive result is signified by a certain visible reaction. There are three major types of RST:

- **Latex fixation test** This test was developed in the 1980s and is largely obsolete. It employs latex beads covered with antigens that will visibly agglutinate around GAS antibodies if these are present.
- **Optical immunoassay** This newer and more expensive test involves mixing the sample with labeled antibodies and then with a special substrate on a film which changes colour to signal the presence or absence of GAS antigen.
- **Lateral flow test** This is currently the most widely used RST. The sample is applied to a strip of nitrocellulose film and, if GAS antigens are present, these will migrate along the film to form a visible line of antigen bound to labeled antibodies. (The technique which we

used). Sensitivity of this test ranges from 80 to 97 % depending on experience and methodology while the specificity is 97 %. [13].

In our study only 144 (24 %) patients needed antibiotics and a huge number of patients 456 (76 %) was benefitted without antibiotics. This suggests a significant reduction in irrational drug prescribing.

We as physician have to keep “patient expectations” into note as the patients in present times can be very demanding [14]. However, it is important to realise that simply prescribing an antibiotic has no meaning. Antibiotics were only prescribed to the patients who had clinically significant symptoms (based on Centor criteria) and/or positive RST and/or a positive throat culture. Any patient failing to meet these criteria were treated with supportive measures only. The symptomatic relief in both the groups were compared using the Chi Squared test and the difference was not found to be statistically significant ($p < 0.005$) thus emphasizing the correct recognition of bacterial from viral cases.

Conclusion

It can be concluded that, use of antibiotic in a case of acute tonsillitis/pharyngitis is irrational and should be instituted only if there is concrete evidence of bacterial etiology based on Centor criteria, RST and Throat culture. Prescribing an antibiotic in all cases may not provide any additional benefit but at the same time may predispose to drug resistance and antibiotic side effects. The study shows

that as many as 76 % patients did well without the use of antibiotics. In developing countries like India, this could be the “need of the hour” [15].

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Compliance with Ethical Standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest None.

Informed consent Informed consent was obtained from all individual participants included in the study.

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