

## Effectiveness of treatment of tonsillopharyngitis: comparative study

KHADER J. ABDUL-BAQI, M.D., PH.D., FAROUK M. N. SHAKHATREH, M.D., M.Sc, PH.D.\*

### Abstract

This study was performed to find out the effectiveness of three different treatments of patients having acute tonsillopharyngitis. Three groups of patients were selected (50 patients in each group). Group I received one antibiotic according to the result of culture and sensitivity test, while groups II and III received two antibiotics or one antibiotic respectively without a culture and sensitivity test. Diagnosis was based on the acutely subjective symptoms of sore throat and positive clinical examination findings. The effectiveness of treatment in group I (96 per cent) was statistically significant ( $p < 0.05$ ) and higher than group II (82 per cent) and group III (74 per cent), while the difference between group II and III was not statistically significant ( $p > 0.05$ ).

Our findings demonstrate that a culture and sensitivity test of the throat swab is necessary before treating acute tonsillopharyngitis. It was suggested that there should be appropriate selection of antibiotics to preserve normal flora, avoidance antibiotics for viral infections, patient compliance with prescription and educational programmes directed at patients and physicians. All of these measures would assist in reducing the volume of antibiotic use, bacterial resistance and the overall cost of treatment of tonsillopharyngitis.

**Key words:** Tonsillitis; Pharyngitis; Antibiotics; Clinical Protocols

### Introduction

Chronic and recurrent acute upper respiratory tract infections (URTIs) are common and considered to be a major concern for the treating physicians. These infections account for two-thirds of antibiotic prescriptions.<sup>1</sup> *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis* are the most common pathogens of URTIs. Although most sore throats are caused by viruses,<sup>2,3</sup> group A beta-haemolytic streptococci (GABHS) are the most common bacterial pathogens in acute tonsillopharyngitis episodes.<sup>2,4-6</sup>

The over-diagnosis of bacterial sore throat or streptococcal tonsillopharyngitis usually leads to unnecessary use of antibiotics. The development of resistance to antibiotics has been a concern in the management of infectious diseases. The major objective of antibiotic therapy is to prevent and reduce the incidence of rheumatic fever and glomerulonephritis. The purpose of this study is to find out the effectiveness of three different modalities of treatment in Jordan of patients with acute tonsillopharyngitis.

### Materials and methods

A total of 150 patients aged 10–40 years with signs and symptoms of acute tonsillopharyngitis were

diagnosed by an ear, nose and throat specialist. Patients were selected according to the following criteria: sore throat, clinical evidence of tonsillar and pharyngeal erythema with exudate or cervical lymphadenitis, no symptoms of rhinitis, bronchitis or laryngitis, no systemic diseases, and no immunosuppressive treatment. Patients were divided into three groups: group I received one antibiotic according to a previous culture and sensitivity test of the throat swab; group II received two antibiotics but no culture and sensitivity test; and group III received one antibiotic but no culture and sensitivity test (Table I). The three groups were matched regarding age and sex to reduce their effect on the outcome of treatment.

All cases included in the study were selected from patients coming to two pharmacies in Amman and were informed about the nature of the study. Each single patient was fitted in one of the cells of Table I to assure the same frequency of cases for each age group. No further cases were added after completion of the cells. Each patient was contacted seven days after starting the prescribed course of antibiotics to assess the effectiveness of treatment (success or failure). Success was defined as cure or improvement of subjective complaints and in findings of the clinical

From the Department of Otolaryngology, Faculty of Medicine, Jordan University Hospital and the Faculty of Medicine\*, University of Jordan, Amman, Jordan.

Accepted for publication: 6 June 2002.

TABLE I  
DISTRIBUTION OF PATIENTS IN THE THREE GROUPS ACCORDING TO AGE AND SEX

| Age groups | Groups |    |     |         |    |     |                 |    |     | Total |
|------------|--------|----|-----|---------|----|-----|-----------------|----|-----|-------|
|            | Males  |    |     | Females |    |     | Males + females |    |     |       |
|            | I      | II | III | I       | II | III | I               | II | III |       |
| 10-14      | 3      | 3  | 3   | 3       | 3  | 3   | 6               | 6  | 6   | 18    |
| 15-19      | 4      | 4  | 4   | 4       | 4  | 4   | 8               | 8  | 8   | 24    |
| 20-24      | 6      | 6  | 6   | 6       | 6  | 6   | 12              | 12 | 12  | 36    |
| 25-29      | 5      | 5  | 5   | 5       | 5  | 5   | 10              | 10 | 10  | 30    |
| 30-34      | 4      | 4  | 4   | 4       | 4  | 4   | 8               | 8  | 8   | 24    |
| 35-40      | 3      | 3  | 3   | 3       | 3  | 3   | 6               | 6  | 6   | 18    |
| Total      | 25     | 25 | 25  | 25      | 25 | 25  | 50              | 50 | 50  | 150   |

examination. Failure was defined as no improvement in subjective complaints and positive clinical findings remaining after the third day of treatment which obliged the patients to visit their doctors to change the treatment.

### Results

A total of 150 patients (75 males and 75 females) were enrolled into this study (Table I) with 50 patients in each group. Table II shows the outcome (success and failure) according to age groups, and sex. The success rate for the different age groups ranged between 87.5 to 100 per cent in group I, 75 to 90 per cent in group II and 66.7 to 80 per cent in group III.

Table III shows that the highest success rate was found in group I, with 23 successes (92 per cent) in males and 25 (100 per cent) in females. In group II, there were 21 successes (84 per cent) in males and 20 (80 per cent) in females. In group III, there were 19 successes (76 per cent) in males and 18 (72 per cent) in females. The difference in success rates between males and females was not statistically significant ( $p>0.05$ ) in the three groups.

Table IV and Figure 1 show the overall total of the three groups and outcome of treatments. The overall success rate in group I (96 per cent) was statistically significant ( $p<0.05$ ) and higher than in group II (82

per cent) and group III (74 per cent), while the difference between groups II and III was not statistically significant ( $p>0.05$ ).

### Discussion

Treatment of acute tonsillopharyngitis, which is mostly caused by GABHS, has become a major public health problem because of the increasing antibiotic resistance of infecting bacteria,<sup>7</sup> and the fact that most sore throats are caused by viruses.<sup>2,3</sup> The over-diagnosis of streptococcal tonsillopharyngitis by physicians almost always leads to antibiotic misuse. This widespread use of antibiotics has led to the increasing resistance of respiratory pathogens.

Our results showed that treating patients with one antibiotic according to the culture and sensitivity test (group I) is significantly more effective (96 per cent,  $p<0.05$ ) than treating patients with two (82 per cent) or one (74 per cent) antibiotic without culture and sensitivity tests (groups II and III respectively). There are many possible explanations for treatment failure, including beta-lactamase-producing bacteria co-infection and destruction of normal flora (alpha-haemolytic streptococci) that compete with GABHS,<sup>8</sup> repeated exposures in crowded communities and uncompliant patients,<sup>2</sup> judicious use of antibiotics leading to increasing bacterial resistance,<sup>3,7,9</sup> and patient pressure on prescribing

TABLE II  
DISTRIBUTION OF OUTCOME (SUCCESS AND FAILURE) OF TREATMENTS ACCORDING TO AGE AND SEX OF PATIENTS

| Age groups |     | Males   |         | Females |         | Males + Females |         |              |
|------------|-----|---------|---------|---------|---------|-----------------|---------|--------------|
|            |     | Success | Failure | Success | Failure | Success         | Failure | % of success |
| 10-14      | I   | 3       | 0       | 3       | 0       | 6               | 0       | 100          |
|            | II  | 3       | 0       | 2       | 1       | 5               | 1       | 83.3         |
|            | III | 2       | 1       | 2       | 1       | 4               | 2       | 66.7         |
| 15-19      | I   | 4       | 0       | 4       | 0       | 8               | 0       | 100          |
|            | II  | 3       | 1       | 4       | 0       | 7               | 1       | 87.5         |
|            | III | 3       | 1       | 3       | 1       | 6               | 2       | 75           |
| 20-24      | I   | 5       | 1       | 6       | 0       | 11              | 1       | 91.7         |
|            | II  | 5       | 1       | 4       | 2       | 9               | 3       | 75           |
|            | III | 5       | 1       | 4       | 2       | 9               | 3       | 75           |
| 25-29      | I   | 5       | 0       | 5       | 0       | 10              | 0       | 100          |
|            | II  | 4       | 1       | 5       | 0       | 9               | 1       | 90           |
|            | III | 4       | 1       | 4       | 1       | 8               | 2       | 80           |
| 30-34      | I   | 3       | 1       | 4       | 0       | 7               | 1       | 87.5         |
|            | II  | 3       | 1       | 3       | 1       | 6               | 2       | 75           |
|            | III | 3       | 1       | 3       | 1       | 6               | 2       | 75           |
| 35-40      | I   | 3       | 0       | 3       | 0       | 6               | 0       | 100          |
|            | II  | 3       | 0       | 2       | 1       | 5               | 1       | 83.3         |
|            | III | 2       | 1       | 2       | 1       | 4               | 2       | 66.7         |

TABLE III

DISTRIBUTION OF OUTCOME (SUCCESS AND FAILURE) OF TREATMENTS AND SEX OF THE PATIENT

| Groups | Males           |                 | Females         |                 | P values |
|--------|-----------------|-----------------|-----------------|-----------------|----------|
|        | Success No. (%) | Failure No. (%) | Success No. (%) | Failure No. (%) |          |
| I      | 23 (92)         | 2 (8)           | 25 (100)        | 0 (0)           | >0.05    |
| II     | 21 (84)         | 4 (16)          | 20 (80)         | 5 (20)          | >0.05    |
| III    | 19 (76)         | 6 (24)          | 18 (72)         | 7 (28)          | >0.05    |

TABLE IV

DISTRIBUTION OF THE OVERALL TOTAL OF THE GROUPS AND OUTCOME OF TREATMENTS (SUCCESS AND FAILURE)

| Outcome | Group I | Group II | Group III | $P_1$ | $P_2$ | $P_3$ |
|---------|---------|----------|-----------|-------|-------|-------|
|         | No. (%) | No. (%)  | No. (%)   |       |       |       |
| Success | 48 (96) | 41 (82)  | 37 (74)   | <0.05 | <0.05 | >0.05 |
| Failure | 2 (4)   | 9 (18)   | 13 (26)   | <0.05 | <0.05 | >0.05 |

 $P_1$ : For groups I and II $P_2$ : For groups I and III $P_3$ : For groups II and III

physicians.<sup>10</sup> Any of these explanations may have been applicable to the cases of failure in our study even to the four per cent failure rate of group I.

### Conclusions and Recommendation

In light of our results and those of other investigators, efforts should focus on methods that respond to current concerns in the treatment of acute tonsillopharyngitis:

- (1) Diagnosis of acute tonsillopharyngitis should be based on the results of a culture and sensitivity test of a throat swab. Members of the Centres for Disease Control/American Academy of Pediatrics (CDC/AAP) recommended principles for judicious use of antimicrobials in common respiratory infections are that 'diagnosis of group A streptococcal pharyngitis should be based on results of appropriate laboratory tests in conjunction with clinical and epidemiological findings' (principle 1) and 'antimicrobial therapy should not be given to a child with pharyngitis in the absence of diagnosed group A streptococcal or other bacterial infection' (principle 2).<sup>3,7</sup>
- (2) Wide spectrum antibiotics reduce or kill the normal flora of the upper respiratory tract, potentiating pathogen overgrowth. Normal flora should be preserved by choosing the appropriate agent according to the culture and sensitivity test.
- (3) Infections of the upper respiratory tract occur more frequently when antibiotics are given in cases of viral infection. This will reduce the patient's immunity and increase bacterial resistance.
- (4) Compliance with the prescribed antibiotic regimen will reduce the chances of bacterial resistance.

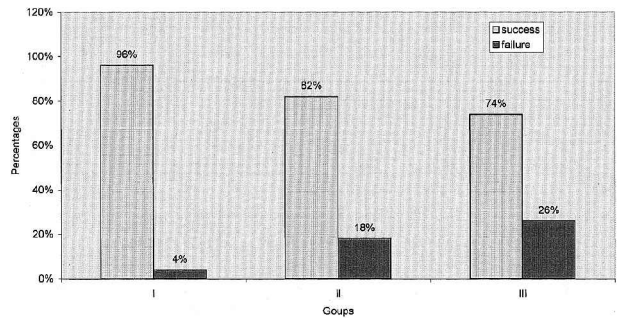


FIG. 1

Percentages of success and failure of treatment in the three groups.

- (5) A patient educational programme as well as educating treating physicians reduces the unnecessary prescription of antibiotics and reduces its use for viral infection.<sup>11</sup>

All these measures and techniques will reduce the volume of antibiotic use and consequently reduce the financial cost of treating acute tonsillopharyngitis. Prospective studies of larger samples and the recurrence rate of re-infection are needed.

### References

- 1 Bartlett G. *Management of Respiratory Tract Infections*. Baltimore: Williams and Wilkins, 1997
- 2 Pichichero ME. Group A beta-hemolytic streptococcal infections. *Pediatr Rev* 1998;**19**:291–302
- 3 Schwartz B, Marcy SM, Phillips WR, Michael AG, Dowell SF. Pharyngitis: Principles of judicious use of antimicrobial agents. *Pediatrics* 1998;**101**:171–4
- 4 Tanz RR, Shulman ST. Diagnosis and treatment of group A streptococcal pharyngitis. *Semin Pediatr Infect Dis* 1995;**6**:69–78
- 5 Putto A. Febrile exudative tonsillitis: viral or streptococcal. *Pediatrics* 1987;**10**:6–12
- 6 Bisno AL, Gerber MA, Gwaltney JM Jr, Kaplan EL, Schwartz RH. Diagnosis and management of group A streptococcal pharyngitis: a practice guideline. *Clin Infect Dis* 1997;**25**:574–83
- 7 Dowell SF, Marcy SM, Phillips WR, Michael AG, Schwartz B. Principles of judicious use of antimicrobial agents for pediatric upper respiratory infections. *Pediatrics* 1998;**101**:163–5
- 8 Brook I. Microbial factors leading to recurrent upper respiratory tract infections. *Pediatr Infect Dis J* 1998;**17**:S62–7
- 9 Cappelletty D. Microbiology of bacterial respiratory infections. *Pediatr Infect Dis J* 1998;**17**:S55–61
- 10 Schwartz RH, Freij BJ, Ziai M, Michael J, Sheridan SCD. Antimicrobial prescribing for acute purulent rhinitis in children: a survey of pediatricians and family practitioners. *Pediatr Infect Dis J* 1997;**16**:185–90
- 11 Wheeler JG, Fair M, Rowlands LA, Simpson PM, Jacobs RF. Impact of parent-focused educational videotapes on pediatric antibiotic use. *Pediatr Res* 2000;**47**:1382A

Address for correspondence:

Dr Khader J. Abdul-Baqi,  
University of Jordan,  
P.O. Box 13001,  
Amman 11942,  
Jordan.

Fax: 962 6 5353388

E-mail: Farouk3000@hotmail.com

Dr K. J. Abdul-Baqi takes responsibility for the integrity of the content of the paper.

Competing interests: None declared