Practitioner Prescribing Habits for Pharyngitis: Implications for Evaluation and Management

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Emerging bacterial resistance patterns suggest that clinicians should use restraint in prescribing antibiotics for various infections. We used pharyngitis as the model for studying prescribing habits, because many clinicians recommend that culture results be analyzed before antibiotics are prescribed. We compared prescribing habits of three groups: practitioners in the Pediatrics, Adult Medicine, and Urgent Visit Departments. Overall, 55% of patients were treated while culture results were pending. Nurse practitioners and physician assistants were more likely than physicians (including osteopaths) to treat patients with pharyngitis who had negative culture results (57% vs 38%). Our results thus show that practitioners should be encouraged to avoid overprescribing for this common condition.

Introduction

Pharyngitis prompts a substantial proportion of outpatient visits to primary care practitioners. Despite a plethora of guidelines, continuing medical education (CME) activities, and assumed knowledge about caring for this condition, its evaluation and management continues to vary greatly. For example, in response to a national questionnaire survey mailed to a random sample of primary care practitioners,[1] fully one quarter of 398 respondents who performed microbiologic studies reported that they used only a rapid antigen test. Of these respondents, 24% of pediatricians and 58% of family practitioners failed to confirm negative test results with cultures, despite recommendations to do so from the Centers for Disease Control and Prevention (CDCP), American Academy of Pediatrics (AAP), and the American Hospital Association (AHA). Although the methods used for rapid antigen tests vary, they are generally similar with regard to sensitivity and specificity. Specificity of these tests approaches 95%; sensitivity averages 75% to 80%. Therefore, negative results of a rapid antigen test should be confirmed by throat culture.[2]

Other recommendations identify patients who should be treated with antimicrobial agents. A recent practice guideline[3] is consistent with previous recommendations concerning treating individuals after an infectious organism's presence in the throat is confirmed by microbiologic or immunologic means. In clinical practice, this guideline is rarely followed; patients and parents simply return to daycare, school, work, and other normal activities when they perceive improvement in symptoms. For patients, the idea of withholding antibiotic therapy is a barrier to returning to these normal activities, even though most such patients are told they probably have a viral infection.

The purpose of our study was to examine use of antibiotic drugs for treatment of pharyngitis. We looked for different patterns among clinical departments and among different types of practitioners (ie, physician extenders and physicians). We also investigated how culture results were used to guide subsequent treatment.

Methods

We reviewed the medical charts of approximately 100 patients from each of three clinical departments (Adult Medicine, Pediatrics, Urgent Visit) in the Warren Paley Medical Office who were seen for pharyngitis during a one-month period.

Charts were reviewed to determine presenting symptoms; treatment selected; type of treating practitioner (nurse practitioner (NP), physician assistant (PA), physician (MD), or osteopath (DO)); whether treatment was started empirically; and whether the patient was diagnosed with another condition that required treatment. Documentation of cough, rhinorrhea, or viral symptoms was also noted. In addition, a random sample of patients who tested culture-negative were called after the visit to be informed of the results and to determine their subsequent attitudes about stopping antibiotic therapy.

Results

Charts of 308 patients were reviewed. Of these 308 patients, 119 were seen in the Pediatrics Department, 94 were seen in the Urgent Visit Department, and 95 were seen in the Adult Medicine Department. Overall, 30% of pediatric patients and 16% of adult patients tested culture-positive. Charts lacked documentation of cough for 33% of patients and lacked documentation of rhinorrhea for 40% of patients. Of patients who tested culture-positive, cough

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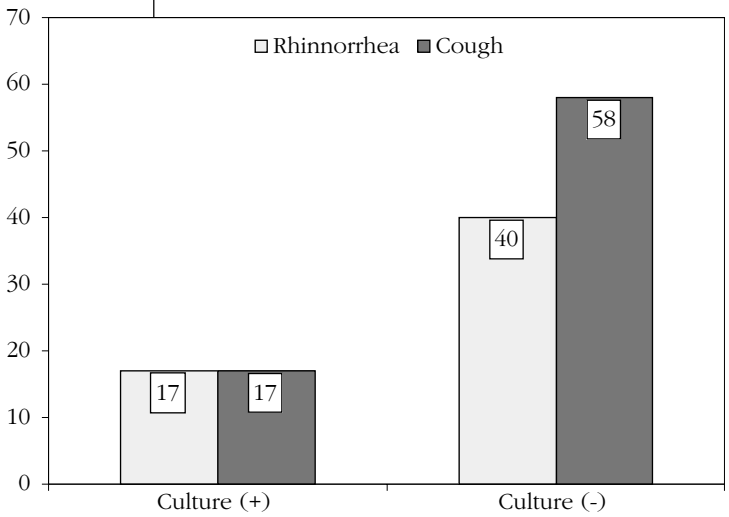

Figure 1. Viral symptoms of pharyngitis documented in medical charts of 308 consecutive patients seen in a one-month period (%).

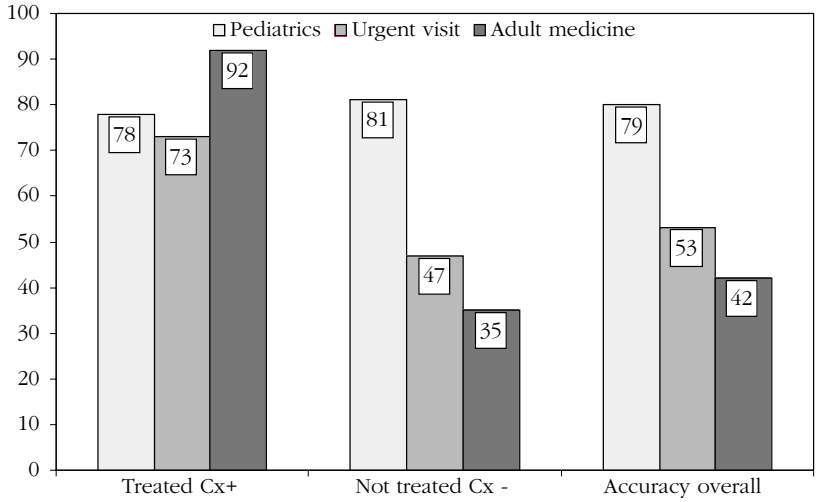

Figure 2. Treatment of pharyngitis by health care practitioners in three departments (%).

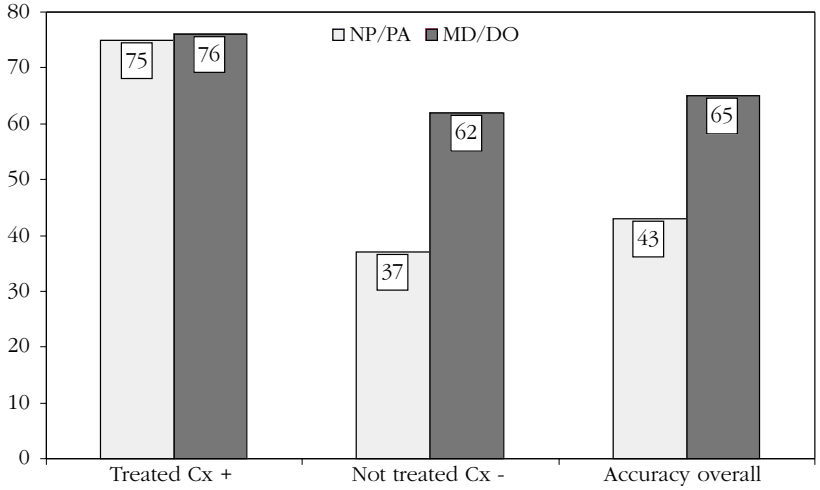

Figure 3. Treatment of pharyngitis by physicians and physician extenders (%).

was documented in 17%, and rhinorrhea was documented in 17% (Figure 1).

Figure 2 lists treatment given by each of the three clinical departments for patients who tested culture-positive and were initially appropriately treated as well as for patients who tested culture-negative and were initially not treated. Overall accuracy of treatment (number of treated culture-positive patients plus number of untreated culture-negative patients divided by total number of patients) is also shown. We found a significant relation between accuracy of treatment and treating department ($p < 0.001$, 2 df, $\chi^2 = 34.01$)) (Table 1).

Figure 3 shows the difference between treatment selected by physicians (MD/DO) and by physician extenders (PA/NP). Patients who were culture-negative and seen by a physician extender were 66% more likely to receive antibiotic therapy than patients seen by physicians (63% vs 38%). This practice did not result in more culture-positive patients being treated (75% for PA/NP vs 76% for MD/DO). Overall accuracy of treatment was thus higher for physicians (79%) than for physician extenders (53%). We found a significant relation between accuracy of treatment and type of professional credential ($p < 0.001$, 2 df, $\chi^2 = 33.22$) (Table 2).

Of 308 patients, 97 (31.5%) were instructed to continue the prescribed antibiotic regimen regardless of culture results. Practitioners' reasons for giving this instruction are listed (Table 3). The three most common reasons cited (sinusitis, otitis media, bronchitis) accounted for 73.6% of reasons given.

Of the 308 patients, 96 (31.1%) were called by our staff to be informed of culture results. Of these 96 patients, 31 (32.3%) were unwilling to stop antibiotic therapy. Some of the more common comments from patients included "I don't think my doctor wanted me to stop it"; "I feel better, so I think I will continue"; "I think the doctor wanted me to take it if I felt better"; and "My doctor told me to take it just in case."

Discussion

Our study confirms the variation in evaluation and treatment of pharyngitis. Indeed, although cough, hoarseness, and rhinorrhea strongly suggest a viral cause, our study showed that almost one third of medical charts contained no documentation of either presence or absence of these symptoms. In addition, a substantial number of patients had these symptoms and had cultures taken anyway. Recovery of Group A streptococcus from the pharynx does not distinguish patients with streptococcal infection (defined by a serologic antibody response) from strep-

tococcal carriers who have pharyngitis caused by a different organism (ie, a virus). Given the viral symptoms, the pretest likelihood of streptococcal pharyngitis is extremely low, making a positive test result more likely to suggest a carrier state than a diagnosis of streptococcal pharyngitis.

During this era of antibiotic resistance, many authors advocate restraint in presumptively starting therapy until infection is confirmed.[2-5] Our comparison of treatment administered by the three clinical departments shows that although Adult Medicine had the highest percentage of treated culture-positive patients (92%), that department had the lowest treatment accuracy (42%). This value was statistically significant, but a potential bias may exist due to a higher likelihood that pediatric practice strongly advocates conservative treatment pending receipt of culture results. This position was formed primarily as a result of the combination of lower incidence of streptococcal pharyngitis in adults and higher number of culture-negative patients who received antibiotic treatment pending receipt of culture results. Presumptively starting antibiotics is discouraged by most clinicians[4] because treatment is often continued despite a negative test result. Our study showed that one third of patients are openly unwilling to stop antibiotic therapy. We did not identify ourselves as physicians when we called patients, and they may be less likely to stop the antibiotic treatment unless a physician instructs them to do so. However, in most offices, physicians are not the most likely personnel to inform patients that their test results are negative. Our finding therefore probably reflects patients' experience in most cases.

When pooled together from all departments, physician extenders were more likely than physicians to prescribe antibiotics pending receipt of culture results. This result may reflect bias, given the possible statistically significant impact of each individual treating department. The Pediatric Department employed only one nurse practitioner, so that department cannot easily be compared with the others. The nurse practitioners and physician assistants we surveyed said that they felt more pressure to prescribe and that patients' comments added to this pressure with comments such as "I had to come back last time for an antibiotic," "I called the physician for a prescription after I left here," or "I'd rather see a physician if you're not going to give me an antibiotic." Other studies[6-8] have shown how practitioners differ by credentials in responding to patient requests for antibiotics. These studies and ours reflect an underlying need for clinicians to have a repertoire of behaviors that positively respond to patients' requests for antibiotics. Some examples of these behaviors include: 1) having an open discussion among practitioners and physician extenders within a practice about how they address this issue;

Table 1. Rate of treatment accuracy observed for three departments treating pharyngitis in 308 patients

	No. (%) of patients treated in department		
	Pediatrics (n=119)	Urgent visit (n=94)	Adult medicine (n=95)
Accurate	95 (80)	50 (53)	40 (42)
Inaccurate	24 (20)	44 (47)	55 (58)

Comparison significant at p<0.001.

Table 2. Rate of treatment accuracy observed for physicians and physician extenders treating pharyngitis in 313 patients

	No. (%) of patients treated by practitioner	
	Physicians[a] (n=124)	Physician extenders[b] (n=94)
Accurate	89 (79)	50 (53)
Inaccurate	26 (21)	44 (47)

Comparison significant at p<0.001.

[a] Includes Medical Doctors (MD) and Doctors of Osteopathy (DO).

[b] Includes Physician Assistants (PA) and Nurse Practitioners (NP).

Table 3. Reasons given by health care practitioners for instructing patients to continue prescribed antibiotic regimen regardless of culture result

Reason	No. (%) of patients
Sinusitis	29 (31.9)
Otitis Media	24 (26.4)
Bronchitis	14 (15.4)
"Just in case"	7 (7.7)
Streptococcus exposure	5 (5.5)
"If patient feels better"	4 (4.4)
Tonsillitis	4 (4.4)
Already receiving antibiotic therapy	3 (3.3)
Adenitis	2 (2.2)
Urinary tract infection	1 (1.1)
Follow-up	1 (1.1)
Impetigo	1 (1.1)
Mycoplasma infection	1 (1.1)
Acute upper respiratory infection	1 (1.1)

2) during well visits, giving patients handouts (available from the AAP, American Academy of Family Practice (AAFP), and CDCP) about antibiotic resistance; 3) in examination rooms, posting newspaper and magazine articles about antibiotic resistance; 4) in waiting areas, posting posters (available from the CDCP) about antibiotic resistance; 5) acknowledging the difficulty of treating viral symptoms; and 6) discussing with patients the therapeutic value of particular symptoms (eg, fever boosts the immune system, cough protects the lungs from pneumonia, runny nose washes out the virus).

"Tests should logically not be done if they do not affect case management."

We have preliminary data indicating that use of a rapid antigen detection test substantially reduces the number of prescriptions given for antibiotic drugs. Moreover, our analysis of cost indicates that the resultant savings in antibiotic drugs as well as reduced use of office resources may offset the cost of the rapid antigen detection test. In addition, the substantial reduction in antibiotic drug prescriptions is consistent with the CDCP, AAP, and AAFP efforts to reduce unnecessary antibiotic use.

Many patients are instructed to continue taking their prescribed antibiotic drugs regardless of culture results (Table 1). Tests should logically not be done if they do not affect case management. Exceptions to this proposition are possible; however, if our study is representative of most practice, almost a third of culture procedures could be eliminated. This reduction would greatly increase the availability of resources (ie, receptionist time, nurse time, medical recordkeeping time, laboratory time, and practitioner time).

Conclusion

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Pharyngitis is a common medical condition whose evaluation and treatment varies greatly among primary care practitioners. Our study confirms this variability. Clinicians should have an open discussion about individual approaches to patients' requests for antibiotic therapy in general and for antibiotic drugs to treat pharyngitis in particular. Physician extenders need support from physician colleagues to enhance appropriate patient care and utilization of resources.

Viral symptoms should be inquired about in every evaluation of pharyngitis. Nurses should be taught to refrain from obtaining throat cultures in those situations, because doing so promotes the patient's expectation that the culture will be sent to the laboratory for analysis. Patients who have viral symptoms (eg, rhinorrhea, cough, conjunctivitis, hoarseness, diarrhea, anterior stomatitis, or discrete ulcerative lesions) are unlikely to have Group A streptococcal infection and should therefore not have specimens taken for culture.[2]

Presumptively starting therapy pending receipt of culture results should be discouraged because treatment often continues despite a negative test result. Early initiation of antimicrobial therapy results in faster resolution of symptoms, but two facts should be remembered. First, group A streptococcal pharyngitis is usually a self-limited disease; fever and constitutional symptoms disappear spontaneously within three or four days after onset, even when antimicrobial therapy is not administered.[9] Second, therapy can be safely postponed for as long as nine days after onset of symptoms and still prevent the occurrence of the major nonsuppurative sequela (acute rheumatic fever).[10]

Each intervention to reduce unnecessary antibiotic drug use for common conditions such as pharyngitis can reduce the number of serious infections that do not respond to conventional antibiotic therapy. Clearly, education of health care practitioners and patients is essential for changing behavior and for helping to reduce the likelihood of antimicrobial resistance.[11] ❖

References

1. Schwartz B, Fries S, Fitzgibbon AM, Lipman H. Pediatricians' diagnostic approach to pharyngitis and impact of CLIA 1988 on office diagnostic tests. JAMA 1994;271:234-238.
2. Committee on Infectious Diseases. Group A streptococcal infections. In: Academy of Pediatrics. Group A streptococcal infections. Red book: report of the Committee on Infectious Diseases. 24th ed. Elk Grove Village, IL: American Academy of Pediatrics; 1997. p. 483-94.
3. Bisno AL, Gerber MA, Gwaltney JM Jr, Kaplan EL, Schwartz RH. Diagnosis and management of group A streptococcal pharyngitis: a practice guideline. Infectious Diseases Society of America. Clin Infect Dis 1997;25:574-83.
4. Schwartz B, Marcy SM, Phillips WR, Gerber MA, Dowell SF. Pharyngitis-Principles of judicious use of antimicrobial agents. Pediatrics 1998;101S:171-4.
5. Tanz RR, Shulman ST. Diagnosis and treatment of group A streptococcal pharyngitis. Semin Pediatr Infect Dis 1995;6:69-78.
6. Schwartz RH, Freij BJ, Ziai M, Sheridan MJ. Antimicrobial prescribing for acute purulent rhinitis in children: a survey of pediatricians and family practitioners. Pediatr Infect Dis J 1997;16:185-90.
7. Mainous AG III, Hueston WJ, Love MM. Antibiotics for colds in children: who are the high prescribers? Arch Pediatr Adolesc Med 1998;152:349-52.
8. Pennie RA. Prospective study of antibiotics prescribing for children. Can Fam Physician 1998;44:1850-6.
9. Brink WR, Rammelkamp CH Jr, Denny FW, Wannamaker LW. Effect of penicillin and aureomycin on the natural course of streptococcal tonsillitis and pharyngitis. Am J Med 1951;10:300-8.
10. Catanzaro FJ, Stetson CA, Morris AJ, Chamovitz R, Rammelkamp CH Jr, Stolzer BL, et al. The role of the streptococcus in the pathogenesis of rheumatic fever. Am J Med 1954;17:749-56.
11. Dajani AS. Adherence to physicians' instructions as a factor in managing streptococcal pharyngitis. Pediatrics 1996;97(6 Pt 2):976-80.