Management of Pharyngitis Revisited

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In a paper in this issue of The Journal, Reed and coworkers[1] set out to determine the prevalence of Chlamydia trachomatis and Mycoplasma pneumoniae in children with and without pharyngitis. They were prompted in this endeavor by an earlier report[2] that suggested a significant role for each of these microbiologic species as a cause of pharyngitis, especially in a sexually active population. In the context of examining this issue, they evaluated a group of symptomatic children with sore throat and a group of asymptomatic (control) children for the presence of group A β-hemolytic streptococci (GABHS), non-group A streptococci, staphylococci, Hemophilus influenzae, C trachomatis, and M pneumoniae. Surprisingly, they found no significant differences in the prevalence of any of these microbiologic species between symptomatic and asymptomatic groups. Accordingly, one might conclude that none of these organisms is a cause of pharyngitis.

Another study, similar in design, was recently reported by McMillan and colleagues,[3] who also found no significant difference in the prevalence of C trachomatis and M pneumoniae in symptomatic and asymptomatic children. However, GABHS were found significantly more often in children with pharyngitis.

The failure of Reed et al[1] to identify GABHS as a pathogen may be because of the modest entry criteria used for this investigation. Patients between the ages of 2 and 12 years with complaint of sore throat constituted the study group. There was no requirement that sore throat be the chief complaint or that there be signs on physical examination of pharyngitis (ie, erythema, edema, or exudate). In a sense, then, the title of their paper is misleading, as pharyngitis was not a criterion for entry. One wonders how often the 2- to 5-year-olds complained of sore throat and what proportion of the study children they represented. The inclusion of children with obvious signs of upper respiratory tract infection (coryza and conjunctivitis) and sore throat serves to dilute the study group further. A study of 5- to 15-year-old or 5- to 20-year-old patients might have been more appropriate for the recovery of GABHS as well as C trachomatis and M pneumoniae.

The importance of GABHS as an etiologic agent of pharyngitis is well established. The principal age group involved is between 5 and 15 years. The illness is most prevalent in winter and early spring. No single sign or symptom or combination of signs and symptoms is pathognomonic in identifying cases of pharyngitis caused by GABHS, a fact that accounts for the important diagnostic role of the throat culture.

Interest in correctly diagnosing streptococcal throat infections has been based on a desire to (1) prevent rheumatic fever, (2) prevent suppurative complications of GABHS (eg, otitis media, sinusitis, cervical adenitis, and retropharyngeal and peritonsillar abscesses), (3) achieve an earlier clinical cure, and (4) prevent transmission of GABHS to household and classroom contacts. Penicillin therapy is long known to accomplish all of these objectives except the achievement of an earlier clinical cure; this issue has only been clarified recently.[4,5]

As rheumatic fever declined in the United States between 1965 and 1984, indifference developed regarding the diagnosis and treatment of acute streptococcal pharyngitis. Several new developments, however, have served to rekindle interest in these clinical problems.

Renewed interest in GABHS was sparked by the appearance of a variety of diagnostic kits in 1984 and 1985 that promised the rapid diagnosis (within minutes) of acute streptococcal pharyngitis directly from a throat swab. The mechanism of rapid diagnosis depends on the unmasking of the group A carbohydrate antigen (by nitrous acid or enzyme extraction) found on the throat swab of an acutely infected individual and its subsequent demonstration by an antigen detection system (latex particle agglutination or enzyme immunoassay). Studies evaluating these diagnostic kits show a high degree of specificity but variable sensitivity (50 to 90 percent), depending primarily upon which culture method for GABHS is used as the standard of comparison. As might be expected, patients who are lightly colonized with GABHS may not be identified by this method. Because a substantial proportion (approximately 25 percent of these lightly colonized patients) are acutely infected, efforts must be made

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to identify them as well. If rapid techniques are used in the office setting, it is recommended that two throat swabs always be obtained from patients with pharyngitis. One swab is used for the rapid detection method; if it is positive, the second swab may be discarded. If the rapid detection test is negative, the second swab is used for a conventional culture.

Almost simultaneously with the development of these new diagnostic techniques, two carefully performed, prospective, placebo-controlled studies in pediatric patients were published providing strong evidence that early penicillin treatment of streptococcal pharyngitis indeed leads to more rapid clinical recovery.[4,5] Patients become afebrile earlier, complain less of throat pain, and experience the disappearance of pharyngitis and cervical adenopathy more promptly.

In contrast to these apparent beneficial effects of the early treatment of GABHS pharyngitis, Pichichero et al[6] have demonstrated a significantly greater incidence of subsequent infections with GABHS in patients treated at the initial office visit compared with patients in whom treatment was delayed for 48 to 56 hours. The authors speculate about a potential immunologic disadvantage to early treatment that may prevent the development of type-specific antibody. The latter provides homologous immunity, which prevents reinfection from the same M-type of GABHS. Unfortunately, the failure to serotype GABHS isolates from episodes of subsequent infection prevents the distinction of relapses from new infections and thereby limits these conclusions. Nonetheless, the results are provocative, and it is hoped they will stimulate a more comprehensive evaluation.

The most compelling recent occurrence stimulating renewed interest in GABHS has been the apparent resurgence of acute rheumatic fever. First reported from the intermountain region in Utah,[7] and now observed in Colorado, Ohio, and Pennsylvania,[8] these cases have aroused interest and alarm. The most worrisome observation is that many patients with acute rheumatic fever did not have antecedent clinical illnesses that were remarkable or suggestive of GABHS disease. Nonetheless, the reappearance of rheumatic fever cases underscores the need for vigilance in case finding and the requirement for a high degree of sensitivity in techniques employed for the detection of GABHS.

In actual clinical practice, how important is "rapid" diagnosis and what are the hazards of early treatment? Suppose it is December, and you are evaluating an 11-year-old boy with the acute onset of sore throat and fever. His temperature is 39.7 °C (103.6 °F), and he is feeling miserable. Physical examination demonstrates an elevated temperature, a beefy red throat, and tender anterior cervical nodes. Only a minority of patients with acute streptococcal infections experience this degree of illness. If a rapid diagnostic test for GABHS is positive, you will, of course, treat the patient promptly. If the rapid test is negative, you should perform a standard throat culture, and many physicians would initiate therapy until the culture results become available. If, however, you do not have access to a rapid test for GABHS, you would perform a standard throat culture and almost certainly initiate treatment until culture results became available. In this patient, because of the severe degree of morbidity, the benefit of the potential early clinical cure is desired; theoretic concerns regarding relapses and recurrences are of lesser importance.

On the other hand, in most cases of streptococcal pharyngitis the degree of illness is mild to moderate. In these situations, I recommend that a conventional culture be performed and advise symptomatic therapy until culture results become known. The slightly protracted illness is less important than the potential immunologic advantages of delayed therapy. The ultimate importance and contribution of rapid testing for GABHS to providing clinical care is marginal.

In summary, I recommend standard throat culture results as a guide to the management of cases of acute pharyngitis. Prompt antibiotic therapy of GABHS infection of recent onset accomplishes an early clinical cure, but may predispose the patient to more frequent subsequent infections. Severity of the acute illness should dictate when prompt antibiotic therapy is offered. If the results of a properly obtained throat culture are negative for GABHS, antibiotic therapy should be withheld or promptly discontinued if it had been presumptively initiated.

References

1. Reed BD, Huck W, Lutz LT, et al: Prevalence of Chlamydia trachomatis and Mycoplasma pneumoniae in children with and without pharyngitis. J Fam Pract 1988; 26:387–392
2. Komaroff AC, Aronson MD, Pass TM, et al: Serologic evidence of chlamydia and mycoplasma pharyngitis in adults. Science 1983; 222:927–929
3. McMillan JA, Sandstrom C, Werner LB, et al: Viral and bacterial organisms associated with acute pharyngitis in a school-aged population. J Pediatr 1986; 109:747–752
4. Krober MS, Bass JW, Michels GN: Streptococcal pharyngitis: Placebo-controlled double-blind evaluation of clinical response to penicillin therapy. JAMA 1985; 253:1271–1274
5. Randolph MF, Gerber MA, DeMeo KK, et al: Effect of antibiotic therapy on the clinical course of streptococcal pharyngitis. J Pediatr 1985; 106:870–875
6. Pichichero ME, Disney FA, Talpey WB, et al: Adverse and beneficial effects of immediate treatment of group A beta-hemolytic streptococcal pharyngitis with penicillin. Pediatr Infect Dis 1987; 6:635–643
7. Veasy GL, Wiedmeier SE, Orsmond GS, et al: Resurgence of acute rheumatic fever in the intermountain area of the United States. N Engl J Med 1987; 316:421–427
8. Wald ER, Dashefsky B, Feidt C, et al: Acute rheumatic fever in Western Pennsylvania and the Tri-State area. Pediatrics 1987; 80: 371–374

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Last, there is a substantial difference in the quit rate in the authors' nonintervention control group (20.0 percent) and previously reported control groups of the studies they quoted. This difference opens the question of an unforeseen variable affecting the control group's quit rate.

Smoking cessation is a complex problem that cannot be handled by a simple prescription for nicotine polacrilex. For those physicians who are using a smoking cessation plan in their offices, however, such as the program offered by the American Academy of Family Physicians, that addresses the behavioral aspects of smoking, especially in the heavily addicted smoker, nicotine polacrilex can play an important role as an adjunct in smoking cessation. The authors also illustrate the need for uniform statistical reporting to allow comparison among smoking cessation programs and trials.

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References

1. Cox JL, Oswald JS, Worden WL: The Travis Smoking Cessation Program: An Instructor's Manual. Lakeside Pharmaceuticals, Cincinnati, 1987
2. Oswald JS, Worden WL, Cox JL: The efficacy of primary care providers utilizing nicotine gum in group centered smoking cessation therapy, in press
3. Solbert LI: The Family Physician's Guide to Smoking Cessation. Presented at the 39th Annual Scientific Assembly of the American Academy of Family Physicians. San Francisco, October 12–15, 1987
4. Shumaker SA, Grunberg NE: Proceedings of the National Working Conference on Smoking Relapse. In Health Psychology. Hillsdale, NJ, Lawrence Erlbaum Associates, 1986, vol 5, supplement
5. Russel MAH, Merriman R, Stapleton J, Taylor W: Effect of nicotine chewing as an adjunct to general practitioners' advice against smoking. Br Med J 1983; 287: 1782–1785.
6. Jarvik ME, Schneider NG: Degree of addiction and effectiveness of nicotine gum therapy for smoking. Am J Psychiatry 1984; 141:790–791
7. Fagerström KO: Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. Addict Behav 1978, 3:235–241

TESTING FOR STREPTOCOCCAL PHARYNGITIS

To the Editor:

I read the article on evaluation of a rapid test with great interest (*Wright A, Crabtree B, O'Connor P: Evaluation of a rapid method for diagnosing streptococcal pharyngitis in an office laboratory. J Fam Pract 1987; 25: 505–508*). In particular I found the following comment intriguing: "Among four plates read as positive but with ten or fewer colonies of β-hemolytic streptococci, . . ."

I have seen agar plates with confluent growth of β-hemolytic streptococci and large rings of inhibition around a bacitracin disk. In those cases, I have held no doubts about the validity of the culture results; however, cultures do have their problems. Picture the following statements:

"The urine cultures read as positive but with fewer than ten colonies on the plate. . . ."

"The sputum culture grew one colony of Hemophilus influenzae, the other organisms grown were all nonpathogens."

Cultures suffer from false positives because of colonization and contamination. My instincts and training tell me that an organism that produces an antibody response from the host is much more likely to be pathogenic than one that simply happens to lie under a culture swab at a given time. To dismiss rapid streptococcus tests as lacking sensitivity because they did not identify every single colony of β-hemolytic streptococcus is fallacious. One must first prove that all throat cultures are 100 percent correct and unambiguous in interpretation.

To evaluate truly the etiology of the common sore throat and the value of testing in determining treatment, one would need a more comprehensive study. Two groups of test subjects would be needed: (1) sore throat patients, and (2) matched healthy controls. The following battery of tests would need to be completed in both groups: standard throat cultures, viral cultures, chlamydiae, mycoplasma and Branhamella catarrhalis cultures,

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