Adolescent and Adult Pharyngitis

More Than “Strep Throat”

In this issue of the Archives, Fine and colleagues1 report a major validation of clinical prediction rules for predicting group A streptococcal (GAS) pharyngitis. They examine the prediction model that I and my research team2 first reported in 1981 and the modification (incorporating age into the decision rule) that McIsaac et al3 reported in 1998. This validation confirms a recent meta-analysis that arrived at the same finding.4

These models provide a probability of a positive group A β-hemolytic streptococcal culture based on a prevalence estimate and 4-point scoring system. The 4-point system appears to work well for preadolescent pharyngitis, where ultimately the clinician must make a dichotomous decision—GAS infection or a viral infection.

However, as patients enter adolescence and continue growing into young adulthood, the model becomes more controversial; indeed, the 2 US guidelines differ in their approach to adult pharyngitis.5 To understand why there is less certainty in the diagnosis of pharyngitis in adolescents and older persons, we note several important differences between this population and young children6:

1. Adolescents and young adults respond to penicillin treatment of GAS with a 2-day decrease in symptoms, while preadolescents do not appear to show this effect7,8.

2. Group C (and other non–group A) β-hemolytic streptococcal pharyngitis occurs more frequently in adolescents and young adults than in preadolescents. In adolescents and young adults, treatment of group C streptococcal (GCS) pharyngitis results in a 1-day shorter duration of symptoms7;8.

3. While both age groups develop Epstein-Barr infections, only the adolescents and young adults develop the infectious mononucleosis syndrome; and adults in primary care: a systematic review of the diagnostic accuracy of symptoms and signs and validation of the Centor score. BMC Med. 2011;9:67.


2. Group C (and other non–group A) β-hemolytic streptococcal pharyngitis occurs much more frequently in adolescents and young adults, as does the Lemierre syndrome (a syndrome of internal jugular thrombophlebitis and metastatic infections usually caused by F necrophorum).

4. Fusobacterium necrophorum pharyngitis occurs much more frequently in adolescents and young adults, as does the Lemierre syndrome (a syndrome of internal jugular thrombophlebitis and metastatic infections usually caused by F necrophorum).

Given these differences, should we empirically treat adolescents and young adults with antibiotics if they have a Centor score of 3 or 4? To answer this question we should make explicit the potential benefits and risk of antibiotic therapy.

If a pharyngitis has a bacterial cause (at least with GAS and GCS pharyngitis), then treatment with appropriate antibiotics will decrease symptom duration for adolescents and young adults.9 We cannot be certain that antibiotics can decrease the duration of fusobacterial pharyngitis. When the patient has bacterial pharyngitis, antibiotics decrease bacterial spread to others.

Treatment of GAS pharyngitis decreases supplicative complications. Treatment without a GAS diagnosis decreases peritonsillar abscess; therefore, we can deduce that treating fusobacterial pharyngitis should decrease peritonsillar abscess.9 Recent studies suggest that F necrophorum is the most common anaerobe causing peritonsillar abscesses. While we cannot prove that treating fusobacterial pharyngitis will decrease the incidence of Lemierre syndrome, that conclusion seems likely. Treating GAS pharyngitis decreases the incidence of the non supplicative complication acute rheumatic fever. It may also decrease the risk of acute glomerulonephritis. Group C Streptococcus clearly can cause glomerulonephritis and may even cause some cases of acute rheumatic fever. We are not aware of any non supplicative complications from fusobacterial pharyngitis.
Given this information, we would like to treat GAS, GCS, group G streptococcal (GGS), and fusobacterial pharyngitis. Since we can only easily diagnose GAS pharyngitis in 2012, how should we proceed? We could diagnose GCS and GGS pharyngitis with throat culture, but most laboratories do not look for non-GAS infection from throat swabs. Few laboratories in the world can culture F necrophorum from throat swabs. These cultures require an anaerobe incubator and special culture media.

Can we use the prediction model to guide our decision making? Does the model predict more than GAS infection? All experts and both guidelines agree not to test or treat patients with scores of 0 or 1 with antibiotics. Scores of 2 are indeterminate, and currently, both guidelines suggest rapid streptococcal testing. Overall, patients with scores of 3 or 4 represent approximately 30% of all adolescent and adult patients with pharyngitis. We have data suggesting that GCS pharyngitis occurs more often with scores of 3 or 4, similar to GAS.

But what about fusobacterial pharyngitis? We have minimal clinical data on fusobacterial pharyngitis. In a review of 6 case reports of bacteremic fusobacterial pharyngitis (without subsequent Lemierre syndrome), 5 of the 6 patients had exudates, and all had fever.10 These reports do not mention cough or coryza. They also do not comment on cervical adenopathy.

A report from Denmark includes 26 patients whose throat cultures grew F necrophorum (the study institution had a laboratory that specialized in culturing this organism from throat swabs).11 Three of the patients had recurrent tonsillitis. They all had sore throats, fever, and unilateral pharyngitis.

Thus we have indirect evidence that fusobacterial pharyngitis often presents with scores of 3 or 4. Non-GAS bacterial pharyngitis is also likely to be a substantial proportion of bacterial pharyngitis. In their penicillin study, Zwart et al1 restricted participants to adults with scores of 3 or 4 and found that approximately 75% had either GAS (50%) or GCS (25%) pharyngitis.7 We expect that many of the remaining 25% had fusobacterial pharyngitis. Thus, although we do not have definitive data, the circumstantial evidence indicates that treating all patients with scores of 3 or 4 would treat many patients with GAS, GCS, and fusobacterial pharyngitis.

If we can confirm this hypothesis, then we can use the prediction model to treat bacterial pharyngitis rather than just GAS pharyngitis. If we set as our goal the treatment of patients with scores of 3 or 4 likely is greater than 80%.

While we are awaiting further data, we must make decisions about adult pharyngitis. Given the potential benefits of treating patients with a high likelihood of bacterial pharyngitis, I favor empirical treatment of patients having scores of 3 or 4. Using narrow-spectrum antibiotics (eg, penicillins or cephalosporins), we will cause little new resistance and potentially prevent serious complications, although it must be said that even narrow-spectrum antibiotics can have serious adverse effects, including diarrhea, rash, and increased incidence of Clostridium difficile infection.

The large-scale validation study of Fine et al provides more evidence of the model’s consistency. In 2012, we should revisit its application to our patients.

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REFERENCES