Role of antibiotics in suspected Group A Strep pharyngitis

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Introduction:

Sore throat is one of the most common chief complaints seen in emergency medicine, with an estimated incidence of over 15 million patient encounters per year. Pathogens vary amongst age groups, with viral infections being the most common (adenovirus, parainfluenza virus, rhinovirus, Epstein-barr virus). Bacterial pharyngitis or tonsillitis may be due to a variety of different organism. However, cases of pharyngitis caused by group A streptococcus remain a clinical relevant entity, as these bacterial infections may go on to cause both suppurative and non-suppurative complications (post-streptococcal glomerulonephritis, rheumatic fever, and rheumatic heart disease). The clinical relevance of these later syndromes has been under debate over the past decade, as incidence of disease has fallen exceedingly low and breakthroughs in treatment of these complications improved.

Purpose:

The purpose of this journal club was to re-evaluate the effectiveness of the physical exam and history to identify patients who are at risk for developing complications, as well as the efficacy of antibiotics on reducing the duration of symptoms in patients with suspected group A streptococcus pharyngitis.

Paper I:


Zwart et al conducted a randomized, double-blinded placebo control trial across 43 family practice centers in the Netherlands between 1994 and 1996. They enrolled 561 patients, aged 15-60, with a chief complaint of sore throat with a duration <7 days and meeting at least three of four Centor criteria. The treatment arm was either Penicillin VK 250mg TID for either 3 days or 7 days duration. Main outcomes were resolution of symptoms within the first 7 days, eradication of GAS bacteria from the oropharynx, and recurrence of sore throat at 2, 4, and 6 months. These authors demonstrated a permanent resolution of symptoms by nearly two days when compared against the 3-day treatment group and
placebo group. This group also had significant clearance rates of colonization in the oropharynx (7% placebo, 41% at 3 days, and 72% at 7 days duration). There was no effect on subsequent episodes of pharyngitis or URIs between all three groups. Most impressively, this paper noted that patients who were treated with a 7 day course of antibiotics returned to work, on average, 2 days earlier than their counterparts in both the 3 day treatment group and placebo group.

Conclusion: Penicillin, when used in the treatment of suspected group A streptococcus pharyngitis or tonsillitis, may reduce the duration of overall illness and may reduce the time spent off from work.

Paper II:


Little et al performed a prospective clinical cohort study in the primary care setting in Wales, to document whether elements of the history and physical exam could predict adverse outcomes in patients with an acute sore throat. Participants were aged 16 and above, who presented to their primary care physician within 14 days of symptoms with a chief complaint of sore throat. The study was conducted nationally across PCP offices in 6 networks between 2006 and 2009. Primary outcomes were quinsy, sinusitis, acute otitis media, and cellulitis, which were evaluated by reviewing the medical record for a 30-day period after the index visit.

Overall, 14,610 adults were recruited to the study from over 600 clinical sites. Little et al note that there was no difference in major complications between the groups who received antibiotics and those that did not, with an overall incidence of complications being <1%. In regards to predicting who might be at risk for complication, those who reported a severe earache or “severe tonsillitis” were at increased risk for developing one of the 4 suppurative complications. Interestingly enough, most complications occurred in patients with “low” Centor scores (ie 2 or less), with 67% of all complications occurring in this group. By default, this group is less likely to receive antibiotics at first presentation given the low-likelihood of this infection being due to group A streptococcus.

Conclusion: In regards to the prevention of suppurative complication in patients with pharyngitis, the presence of severe tonsillitis (exudate, swelling) as well as severe ear pain was demonstrated to be clinically significant predictors of those who may suffer complications such as quinsy, AOM, sinusitis, or cellulitis. Other findings such as a high Centor score, fever, cervical lymphadenopathy, and purulent tonsils have not been shown to be predictive.

Paper III:


Robertson, et al performed a meta-analysis on all reported clinical studies (randomized or quasi randomized trials) of patients with suspected GAS pharyngitis, undergoing treatment with any antibiotic
for the prevention of acute rheumatic fever (ARF). Their hope was to identify the usefulness of antibiotic treatment for the prevention of ARF and to better appreciate the clinical trials who led to the current recommendation, by the IDSA, AAP, etc. for the use of antibiotics in patients with suspected GAS pharyngitis for the prevention of ARF (level 1).

Following an extensive literature review dating back to the 1960’s, only 10 studies were identified based on relatively straightforward inclusion/exclusion criteria. Eight out of the ten trials identified were conducted at US military hospitals between 1950 and 1957 in young adults. All ten trials used the criteria of “exudative tonsillitis or pharyngitis” as the method of identifying group A streptococcus as the probable pathogen. These were not proven by culture to be GAS in origin. This inherently flawed, as epidemiological studies and subsequent cohort studies (see paper #2) have demonstrated a very low incidence of disease (GAS as the causative agent) in patients over the age of 18, as well poor sensitivity and specificity of the physical exam to differentiate bacterial vs viral causes of pharyngitis/tonsillitis. Either way, this meta-analysis demonstrated a NNT of 53 to prevent ARF, a number which has never been repeated in the modern era, as no trial after 1960 has had a case of ARF in the developed world.

Conclusion, PCN VK or PCN G may decrease the incidence of ARF in patients who present with a high-probability of GAS pharyngitis or tonsillitis, in regions where the prevalence of ARF is higher than that of the developed world. Treatment of patients with suspected GAS pharyngitis/tonsillitis in the developed world, for the purpose to prevent non-suppurative complications is not supported by the current literature due to exceedingly low incidence of disease.