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Sore throat: Is it such a big deal anymore?

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Summary Sore throat remains a common disease of childhood, and a major cost and cause for antibiotic prescriptions. The management of sore throat remains controversial in affluent countries with various guidelines available and overall poor adherence to those guidelines. Group A streptococcus is the commonest bacterial cause with important sequelae including acute rheumatic fever (ARF). The driver for diagnosis and treatment is still questionable. In most affluent populations it is difficult to justify antibiotic treatment on the basis of preventing ARF, whereas this remains the major driver for sore throat management in populations at higher risk of ARF. Reduction in severity and duration of symptoms may be a reasonable basis to consider antibiotic treatment, and thus accurate diagnosis of GAS pharyngitis, particularly in those with more severe symptoms. The potential role of rapid tests in diagnosis appears to be increasing.

Introduction

The management of sore throat is controversial in affluent countries with varying diagnostic criteria and guidelines for management in existence. The role of antibiotic treatment has been questioned in an era when many no longer perceive 'Strep throat' to be a significant problem.[1] As group A streptococcus (GAS) pharyngitis is usually self-limiting, the drivers for early diagnosis and appropriate treatment are reducing transmission, symptom severity and duration and the risk of developing acute rheumatic fever (ARF).[2] ARF is a post-infectious auto-immune sequelae of GAS.[1] The incidence of ARF is low in industrialised countries, although ARF continues to cause hundreds of thousands of cases and deaths each year in developing countries.[1]

The use of a single dose of intramuscular Penicillin has been shown to be effective at reducing ARF incidence after

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a suspected GAS pharyngitis episode; a meta-analysis found an overall 80% protective effect with the use of penicillin for GAS pharyngitis, with number needed to treat of 60 and overall absolute risk reduction of 1.67% with any antibiotic use.[3]

Epidemiology

There are many causes of sore throat which range from bacteria such as GAS and *Neisseria gonorrhoea* to multiple respiratory viruses including *Influenza*, *Parainfluenza* and *Adenovirus*.[4] The probability of a patient having GAS is only second to a viral cause at 5—36% versus 50—80%. GAS is the most common bacterial cause for acute pharyngitis and the major reason for which antibiotic therapy may be indicated.[5] Therefore, in a patient with acute pharyngitis, the clinical decision that usually needs to be made is whether or not the pharyngitis is attributable to GAS.

In Australia, about 6% of presentations to primary care by children are with tonsillitis.[6] There are an estimated 7.3 million primary care visits per year annually with sore throat in the United States for children aged between 3 and 17 years of age.[7] The estimated cost for sore throat consultation visits per year in the United Kingdom is 60 million pounds excluding any costs of further investigation or management.[8]

There is a paucity of studies that estimate the incidence of GAS pharyngitis and most are from the mid-20th Century. The most extensive studies of incidence were the Dingle family studies in the 1950s based on a group of Cleveland families. They noted an incidence of sore throat at 0.20 per person-year in children.[9] More recent studies done between 1988 and 1998 in populations with high rates of ARF, were in New Zealand, Kuwait and India. They noted an incidence of a GAS culture-positive sore throat once every one to two years in each child. However serology was not done in any of these studies so incidence will have been over-estimated because of the inclusion of GAS carriers.[10]

The most comprehensive population-based study in recent times was a prospective, family based cohort study over a 16 month period from August 2001 in Melbourne, Australia. A total of 853 people were included from 202 families, randomly selected from 3 primary care practices in diverse geographic and socioeconomic regions of suburban Melbourne. The incidence in school-aged children aged between 5 and 12 years for acute sore throat, GAS swab-positive pharyngitis and serologically confirmed GAS pharyngitis was 33, 13 and 8 per 100 child-years respectively. The overall GAS carriage rate was 8—16% with the lowest rate in summer and highest rate in winter.[11]

While the Melbourne study demonstrated that the incidence of sore throat and GAS pharyngitis has remained remarkably stable over at least half a century in affluent, temperate-climate regions, studies from tropical regions tend to show more diversity in incidence rates. A prospective surveillance study of 685 children in Fiji showed a high incidence of 1.6 episodes of sore throat per child-year of which 14.7 cases per 100 child-years (95% CI, 11.2—18.8) were GAS culture-positive (serological confirmation was not performed). Group C and group G streptococci were frequently isolated with an incidence of 28.8 cases per 100 child-years (95% CI, 23.9—34.5), although their contribution to pharyngeal infection is not clear. The overall GAS carriage rate was 6%.[12]

By contrast, the Aboriginal population of northern Australia seems to have a remarkably low incidence of both sore throat and GAS culture-positive pharyngitis. A study from August 2003 to June 2005 in the Top End of the Northern Territory of Australia was conducted in three remote Aboriginal communities. There were a total of 531 household visits which included 4842 consultations. Based on two reported episodes of sore throat in children, the incidence density was 8 episodes per 100 person-years (95% CI, 4—15 episodes per 100 person-years). There were no cases of symptomatic GAS pharyngitis. The median point prevalence of throat carriage of GAS was 3.7%, group C was 0.7% and 5.1% for group G. There was no correlation with season or overcrowding.[13]

Knowing risk factors for transmission is important when considering control measures. The highest rates of GAS infection are in school-aged children and usually secondary cases occur within 2 weeks of index case. The 2001 study in Melbourne noted that 18/42 (43%) families with a primary case of GAS culture-positive sore throat had at least one secondary case. Of those 18 families, more than half (11/18) had more than 2 secondary cases. Of those at risk, 13% (95% CI: 9—18) contracted a secondary case. They were able to determine *emm* type in 26/32 (81%) of secondary culture positive cases, of which 25/26 (96%) were the same as the primary case.[11]

Clinical features

GAS sore throat is most common in children aged between 5 and 15 years of age and usually presents in winter or early spring. There is often a history of exposure to someone with sore throat. There are two distinctive groups of clinical features that have previously been described in an attempt to differentiate between likely viral and GAS pharyngitis. Features most indicative of GAS pharyngitis are a sudden onset of sore throat, fever, headache, nausea, vomiting and abdominal pain. On examination, features may include tonsillopharyngeal inflammation with patchy exudates, palatal petechiae, anterior cervical adenitis and/or a scarlatiniform rash. Viral pharyngitis tends to be accompanied by symptoms of conjunctivitis, coryza, cough, diarrhoea and hoarseness. Additionally, discrete ulcerative stomatitis and a viral exanthem may be present.[4]

Of course, most individuals with sore throat have only some of these features, which makes differentiation between viral and bacterial causes fraught if based on clinical features alone. A systematic review and meta-analysis published in 2012 reviewed the best clinical decision rules (CDRs) published between 1975 and 2010 to diagnosis GAS pharyngitis in children. Some CDRs were found to have equal performance to some rapid diagnostic tests (RADTs) for excluding diagnosis. The suggestion from this review was that the CDRs should be used to aid reduction of antibiotic use only in those children with high risk of GAS pharyngitis.[14] The most common CDRs used to date are the Centor and McIsaac (which is a modified version of Centor and accounts for patient age) criteria, which determines