

Symptomatic treatment of UPPER RESPIRATORY TRACT symptoms in children

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Most upper respiratory tract infections are viral and require symptomatic treatment. Antibiotics are commonly overused, even though they should be thought of as being contra-indicated due to the rapid emergence of antimicrobial resistance.

Acute bacterial sinusitis may complicate a viral URTI, but special investigations for diagnosing acute sinusitis are unhelpful. Treatment of pain and fever is usually the only non-specific measure that helps. Antimicrobial treatment has become the chief treatment of acute sinusitis, but there are studies that suggest that these agents do not alter the course of the disease.

*Since hearing loss is a risk of untreated and severe acute otitis media, this condition is usually treated with antibiotics. However, a recent Cochrane Review has concluded that the number of patients needed to treat for one patient to benefit is 15.**

The picture of itching, sneezing and profuse rhinorrhoea is typical of early allergic rhinitis, but nasal obstruction becomes more prominent over time, especially in perennial allergic rhinitis. This gives rise to the classic facial appearance of children with perennial allergic rhinitis and to the many complications. The most effective therapy for allergic rhino-sinusitis involves topical nasal steroids.

* The number needed to treat (NNT) is an index of the true treatment effect and is widely used in evidence based medicine. It indicates how many patients would have to be treated for one positive outcome. In this example, 15 patients with acute otitis media would need to be treated with antibiotics for one patient to benefit. In terms of hearing loss, this makes it worth while – one case of hearing loss will be prevented for every 15 patients with severe otitis media that are treated with antibiotics. For a treatment effect to simply clear up otitis media 15 would be a high number if hearing loss was not a complication. The conclusion is that, in cases of severe otitis media, one should give antibiotics to prevent hearing loss, because one is not sure which one of the 15 patients is likely to develop hearing loss.

What to do for the child with yet another upper respiratory tract infection is a common practice dilemma. Unfortunately, upper respiratory tract infections are commonly mismanaged, particularly by the use of antibiotics for viral disease. Of similar concern is the use of oral corticosteroids, often together with antihistamines, for both viral infections and allergic disease. There is a definite place for both antibiotics and corticosteroids in upper respiratory tract disease, but these indications are limited to clearly defined conditions. Unnecessary antibiotic usage can be reduced by careful medical and patient education.^{1,2}

ACUTE RHINOPHARYNGITIS

This is the 'common cold', the most common condition in both children and adults. Most infants and young children have a mean number of six such illnesses a year.³ Almost all 'colds' are caused by viruses such as rhinovirus, coronavirus, respiratory syncytial virus, parainfluenza virus, influenza virus, Coxsackie's virus and adenovirus.⁴ Some new respiratory viruses have recently been described, including the Human metapneumovirus and the Boca virus. On occasion, these viruses cause upper (sinusitis and otitis media) and lower airway (bronchitis and pneumonia) complications. There is much debate about the actual mode of transmission, but clearly both aerosol transmission as well as direct contact of contaminated hands with the airway occur.⁵ There is an incubation period of two

to five days and a sick individual is 'contagious' for some hours before, to a few days after the onset of symptoms.⁵

The typical symptoms in older children and adults include sore throat, runny nose, nasal congestion, sneezing, dry cough and mild fever, with some degree of malaise. In infants, the symptoms may be more subtle and could include restlessness, crying, anorexia, vomiting, poor sleep and even respiratory distress due to a blocked nose.⁵

Bacterial complications of viral upper respiratory tract infections usually consist of acute sinusitis or acute otitis media. Occasionally, lower respiratory tract infections occur with respiratory distress. Viral infections are the most common reason for an acute exacerbation of asthma, and therefore lower respiratory signs are not necessarily due to bacterial super-infection.⁶ Likewise, the presence of recurrent symptoms of URTI, especially in spring and summer, should raise the possibility that the condition is allergic rhinitis and not infective in origin.⁷

Treatment of a viral URTI is symptomatic⁵. Rest and adequate fluid intake are the most helpful strategy. Paracetamol is usually given for its antipyretic and analgesic effect. Topical nasal decongestants may provide some relief. All other therapies have never been proven to work.⁸ These include antihistamines, oral decongestants and antitussives, especially combination preparations. Their role is strictly that of providing a placebo effect. Neither oral corticosteroids (especially steroid/antihistamine combinations) nor antibiotics have a place. Indeed, with the emergence of antimicrobial resistance, antibiotics must be thought of as being contra-indicated. They should not be given routinely to prevent secondary bacterial infection (see Tables I and II). HIV-positive children should not be managed differently.

There are also no conclusive studies showing the benefit of vitamin C in either the prevention or treatment of URTIs.

Universal influenza vaccination of children between 6 and 23 months is practised in the USA,⁹ but elsewhere it is recommended for high-risk children only.

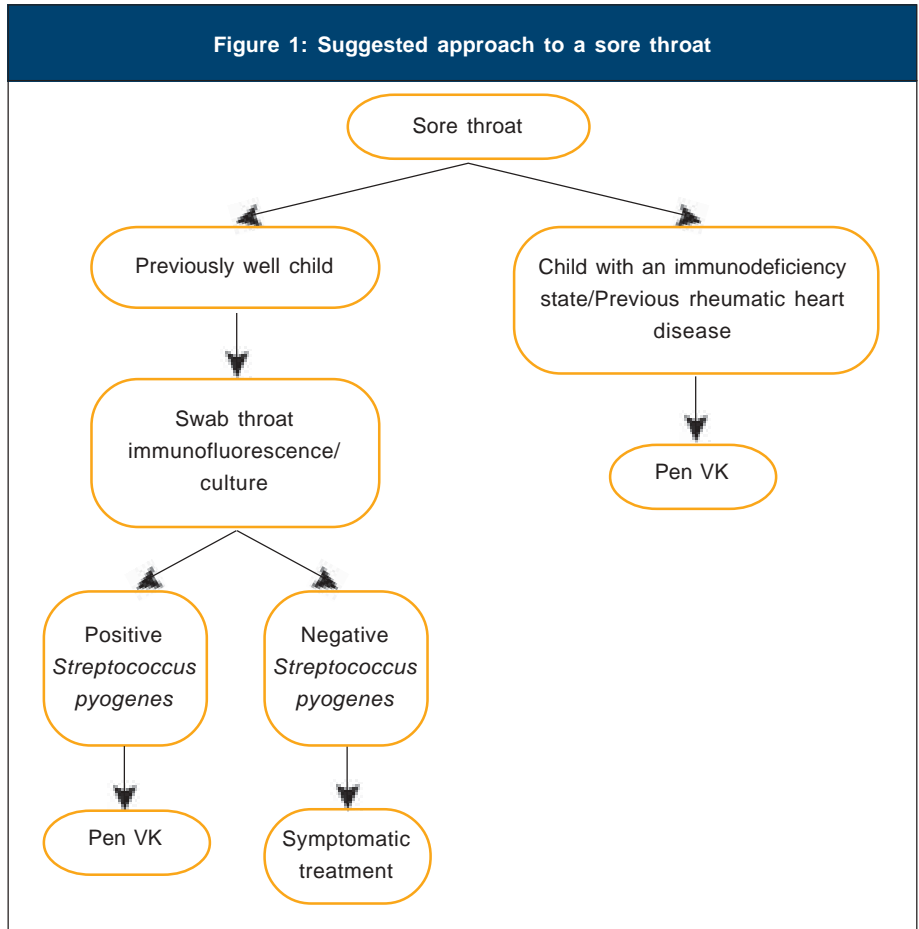


Table I: Indications for antibiotic use in URTIs

Child younger than three months of age
Primary immunodeficiency states (not routinely in HIV infection)
Proven streptococcal sore throat
Severe symptoms of acute otitis media
Severe acute rhinosinusitis or disease lasting longer than 7-10 days

Table II: Situations where antibiotics should not be routinely indicated

Green mucus
A 'cold'
Pharyngitis
Asthma
Recurrent 'colds'
Influenza

The importance of viral infections in protection versus causation of atopy, and especially asthma, is hotly debated. Respiratory viruses may, in fact, lead to significant continuation of the asthma phenotype.⁶

Of particular interest to the epidemiological trend of a rising prevalence of allergic diseases is the so-called Hygiene

Hypothesis of allergy aetiology. Improvements in hygiene, together with a reduction in the frequency of respiratory infections in infancy, are strongly associated with an increasing prevalence of atopic diseases in western countries.¹⁰ The mechanism for this finding is through an influence on the Th₁/Th₂ cellular pathways of the immune system. Interferon gamma (IFN-γ) drives Th₁ development

away from the Th₂ or atopic pathway. The circulating levels of IFN- γ are usually reduced in atopic infants, but greater exposure to bacteria or bacterial products early in life increase IFN- γ , while the artificial reduction in bacterial exposure through the early use of antibiotics, improvements in public health and hygiene, changes in infant diets, and smaller family size contributes to a reduction in IFN- γ .

ACUTE SINUSITIS

Most episodes of sinusitis (or rhinosinusitis) are due to viruses. Acute bacterial infection of the sinuses is commonly due to *Streptococcus pneumoniae*, nontypable *Haemophilus influenzae* and *Moraxella catarrhalis*.¹¹ Predisposing factors to bacterial colonisation of the sinuses are viral rhinopharyngitis, allergic rhinosinusitis, adenoiditis, smoking (active and passive), septal deviation, nasal foreign body, immunodeficiency states, cystic fibrosis and diving.⁵

Acute sinusitis may be suggested by nasal symptoms of a viral URTI persisting for more than 10 days, or nasal secretions becoming purulent. Halitosis, fever, cough and headache are variably present (especially in children).⁵ Special investigations for acute sinusitis are uniformly unhelpful. Nasal swab and culture do not help to identify the organism, as there is a lack of correlation between sites.¹² Both plain x-ray and CT scan are not helpful for acute disease.¹³

Treatment of pain and fever are usually the only non-specific measures that help. Antimicrobial treatment consists of amoxicillin (90 mg/kg/day given 8 hourly for 14-21 days) or, alternatively, amoxicillin/clavulanate, cefuroxime or a macrolide.¹² There are studies suggesting that these agents do not alter the course of the disease.¹⁴

Topical corticosteroids have been shown in at least three studies to improve symptoms.¹⁵⁻¹⁷ Some authors recommend that topical corticosteroids form the basis of therapy and that antibiotics should be reserved for more severe disease, complications or symptoms lasting beyond 7-10 days.¹⁸ Oral corticosteroids may be useful if the sinusitis is complicated by allergic rhinitis and/or asthma.¹⁹ Since acute and especially repeated attacks of

sinusitis are complications of allergic rhinosinusitis, affected children and adults should be evaluated for allergy and treated accordingly.²⁰ This is a useful approach to limiting the cost and quality of life impairment of many patients. Prophylactic treatment of allergic rhinitis with a regular topical corticosteroid often stops further episodes of sinusitis.²⁰

Chronic sinusitis is defined as symptoms attributable to the facial sinuses for two to three months or longer. In chronic sinusitis, intermittent sinus obstruction and internal metabolic changes lead to bacterial overgrowth and acute infective sinusitis. This acute sinusitis may complicate upper respiratory tract infection in up to 5% of cases.⁵

The anatomical relationship of the nose to the sinuses, Eustachian tubes, throat, tonsils and adenoids means that the upper airway (nose, sinuses and ears) functions as an interconnected unit. The common epithelium is subject to both intrinsic inflammatory processes and also to obstruction by vascular engorgement and mucous plugging. Therefore, the sinuses and middle ear cavities are often involved in chronic rhinitis. Many authors would thus believe that chronic allergic sinusitis always accompanies allergic rhinitis.²¹

ACUTE OTITIS MEDIA

Since hearing loss is a risk of untreated and severe AOM, this condition is usually treated with antibiotics. However, a recent Cochrane Review concluded that the number needed to treat for a benefit is 15.²² (* See page 14.) In children older than 6 months, it is recommended to delay the use of and only use antibiotics for more severe disease or a more protracted illness. A similar antibiotic selection to that of acute sinusitis is sufficient. Chronic middle ear disease is a risk factor from acute infection, and this is more common in allergic children.

ALLERGIC RHINITIS

Allergic diseases are becoming epidemic in the modern world. An atopic link between allergic rhinitis, chronic sinusitis and otitis media with effusion has been confirmed by various studies.²³ In infants with chronic or recurrent middle ear disease, nasal metachromatic cells were detected more frequently, and in a long-

term follow-up of infants and children in general practice, allergy (family history, spasmodic nocturnal cough, blood hypereosinophilia and maxillary rhinosinusitis) was shown to be an important association.²⁴ Findings in other studies have been similar.²⁵

Historically, the clinical picture of allergic rhinitis has focused on the direct symptoms and signs in the nose. The occurrence of itching, sneezing and profuse rhinorrhoea is typical of early allergic rhinitis, but nasal obstruction becomes a prominent symptom over time, especially in perennial allergic rhinitis.²⁶ This gives rise to both the classic facial appearance of children with perennial allergic rhinitis, and to the many complications.²⁶

The “allergic facies” arises as a result of a blocked nose and is characterised by²⁶

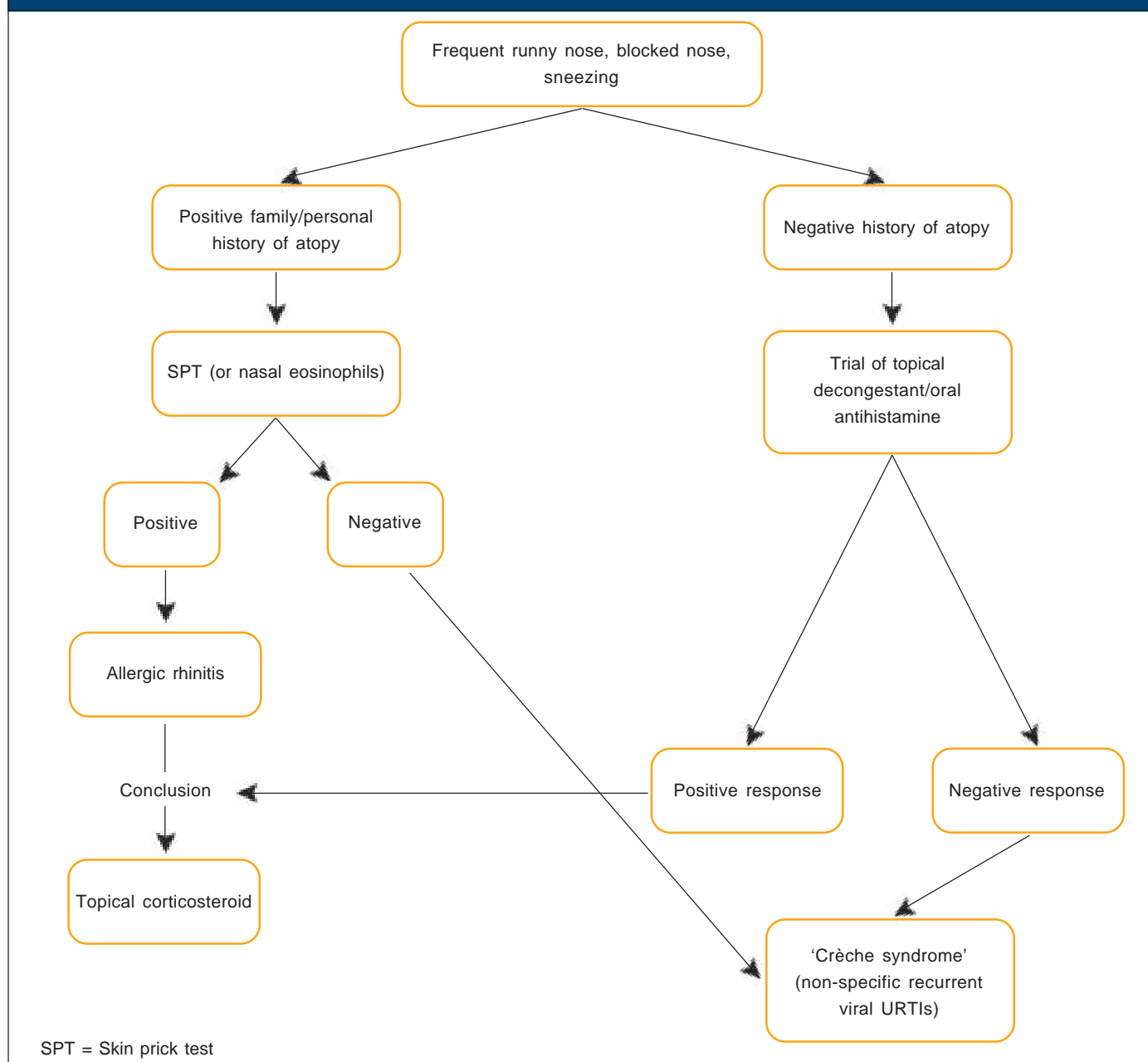
- pallor – often appearing remarkably pale;
- allergic shiners – bluish discoloration of the lower eyelids (due to obstructed venous drainage from this area of the face);
- mouth breathing;
- long-face syndrome – of maxillary and dental disordered development, controversially attributed to nasal blockage;
- allergic mannerisms – ‘allergic salute’, performed in an attempt to open the airway.

Complications of allergic rhinitis include those described earlier: chronic sinusitis and acute infective sinusitis, otitis media with effusion, long-face syndrome, and, probably the most troublesome of all, an impaired quality of life.²⁶

Allergic rhinitis causes the following sleep disturbances: sleep-disordered breathing, periodic breathing, hypopneic and hypoventilation episodes and increased micro-arousals, attributed to increased upper airway resistance. Disturbed sleep can result in chronic fatigue syndrome, which impacts heavily on the patients’ quality of life by resulting in the limitation of activities, emotional problems and impaired learning ability in children. The appropriate treatment of allergic rhinitis will improve sleep quality and thereby quality of life.²⁷

The foregoing discussion can be

Figure 2: Suggested approach to a child with recurrent rhinitis



summarised by a fairly sweeping statement that allergic rhinitis (and other chronic rhinitides) are seldom limited to the nose. Therefore, in the examination and investigation of a patient with suspected allergic rhinitis, the entire upper airway should be examined (sinuses, ears, throat). Clinical examination of the ears, as well as tympanometry, frequently reveals middle ear disease. X-ray examination of the sinuses, although often performed, is limited in its ability to demonstrate chronic inflammation.

In addition to the above, there is a strong relationship between upper airway allergy and asthma. More than 75% of asth-

matic children have co-existing allergic rhinitis.²⁷ Chronic sinusitis should therefore be considered in cases of asthma resistant to treatment, as these have frequently been shown to be associated.²⁷

The most effective therapy for allergic rhinosinusitis (as the disease should correctly be called) involves topical nasal steroids.²⁷ Other therapeutic modalities play a role either in relieving acute symptoms or treating complications. The use of antibiotics should be restricted to acute sinusitis or otitis media, but adequate prevention should render this unnecessary. Topical steroids do not predispose to, or aggravate, an infective process.²⁶

CONCLUSION

URTIs are common, but so is allergic rhinosinusitis. There is a limited role for antimicrobial agents in upper airway disease. There is also a very limited role for oral corticosteroids. Antibiotics should be used cautiously and correctly for specific acute bacterial infection, and not prophylactically. Corticosteroids (preferably topically) will solve many of the problems of allergic upper airway disease. It is useful to think of allergy in a child who has repeated upper respiratory tract 'infections', especially in the summer. □

References on p. 28

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