Diagnosing and treating the acute sore throat

Acute sore throat may present as part of a generalised viral upper respiratory tract infection, be a symptom of specific pharyngeal infection, or be part of a generalised systemic disorder. The diagnosis is mainly clinical. The doctor needs to keep clearly in mind the differential diagnoses appropriate to the age of the patient, and also an appropriate treatment regimen.

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Acute sore throat is one of the most common complaints encountered in general practice. The causes can be grouped as infection, irritation and systemic disease (Table). Of the infective causes, most are viral and the remainder are a variety of bacterial and fungal conditions, predominantly group A beta haemolytic streptococcal infection.

The majority of acute sore throats are due to viral illnesses. On clinical grounds it is very difficult to differentiate a viral from a bacterial infection. Nevertheless, pustular tonsillitis (aggregates of pus on the tonsils) is suggestive of bacterial infection, and diffuse mucosal hyperaemia plus or minus granular pharyngitis is usually viral in aetiology.

Viral infections

At least 50% of acute sore throats are caused by viruses. They may occur during the prodrome of acute viral upper respiratory tract infection or may continue while the systemic symptoms persist. A large number of viruses, including rhinovirus, Epstein–Barr virus, influenza virus, parainfluenza, adenovirus, coxsackievirus and enterovirus, have been implicated.

Clinical features

The discomfort associated with a viral infection ranges from mild to extremely severe. Occasionally there may be associated odynophagia and rarely dysphagia and drooling.

The virus most commonly associated with severe symptoms is Epstein–Barr virus. In patients with infectious mononucleosis (glandular fever), the tonsils and the pharynx are sometimes covered by a pseudomembranous exudate (Figure 1), the appearance of which may cause

IN SUMMARY

- **Most acute sore throats are due to viral illness.**
- **Although on clinical grounds it is very difficult to differentiate a viral from a bacterial infection, aggregates of pus on the tonsils suggest bacterial infection, and diffuse mucosal hyperaemia plus or minus granular pharyngitis is usually viral in aetiology.**
- **Throat infections, whether bacterial or viral, are usually self-limiting, and if antibiotic therapy is being considered for a bacterial infection the risks and benefits should be discussed with the patient.**
- **In most cases of acute sore throat, treatment consists mainly of symptomatic relief.**
- **If the acute sore throat has any associated mucosal bleeding, the attending clinician should be alerted to the possibility of an underlying sinister condition, such as acute leukaemia.**

this illness to be mistaken for severe bacterial tonsillitis. In times gone by, it was confused with diphtheria.

Viral pharyngitis is characterised by generalised erythema and swelling of the pharynx. Odynophagia and drooling tend not to be present, although dysphagia is encountered occasionally. Examination of the neck may reveal bilateral upper deep cervical lymphadenopathy, and there may be generalised signs such as hepatosplenomegaly or lymphadenopathy in the axilla or groin. The clinical course is determined by the underlying virus and there may be accompanying systemic symptoms such as rigors, diffuse myalgia, vomiting and diarrhoea.

Measles can be associated with an acute sore throat; the pharyngeal manifestation is characterised by the presence of small white spots (Koplik's spots), which are about the size of a pinhead and surrounded by an area of erythema. Koplik's spots may precede the onset of a typical morbilliform rash by four to five days and fade as the rash appears. A membranous pharyngitis may also occur in measles.

With chickenpox, acute sore throat may occur in association with superficial vesicles or pustules within the oral cavity. There may be some ulceration with the vesicles, and there is always surrounding erythema and inflammation.

Herpes simplex lesions of the pharynx usually give rise to small vesicles that rupture and form shallow painful ulcers. The episode is self-limiting and of short duration.

Herpes zoster does not commonly affect the pharynx; however, if the virus is distributed in the ninth or tenth cranial nerve, the patient may present with a sore throat. The vesicles usually appear unilaterally and are extremely painful.

Treatment: symptomatic relief

The treatment of viral causes of sore throat is directed mainly at controlling the symptoms. For viral infections, hydration and temperature control, with paracetamol, aspirin (avoid in children) or ibuprofen, are indicated. If the sore throat is extreme, locally acting antiseptic and/or analgesic preparations are sometimes helpful. In my experience, the most useful commercially available preparations are anti-inflammatory gargles such as benzydamine hydrochloride (Difflam Solution).

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Figure 1. Inflamed tonsils covered with exudate in infectious mononucleosis.

Bacterial infections

Tonsillitis

The second most common cause of acute sore throat is bacterial tonsillitis. The most commonly identified causative agent is group A beta haemolytic streptococcus (*Streptococcus pyogenes*), which is isolated in roughly 30% of all cases of acute bacterial tonsillitis – in the remaining 70%, the agent is never firmly established. Other streptococci, *Staphylococcus aureus* and *Haemophilus influenzae* have been shown to be causative agents in acute tonsillitis, as have a variety of anaerobic bacteria.

The bacteriology of acute tonsillitis is complicated by the fact that most, if not all, of the bacteria thought to cause sore throat are harboured on the tonsillar surface of asymptomatic individuals without causing any clinical signs of infection.

As with all mucous membranes, the tonsillar surface is covered by stratified squamous epithelium interspersed with occasional ciliated cells. Overlying this epithelial surface is a film of mucus that is continually propelled forward by the action of the cilia. To cause invasive disease, micro-organisms must attach firmly to the epithelial cells and avoid being transported away with the mucus film. Once attached, the micro-organisms can proliferate, forming colonies and releasing extracellular toxins, which can then injure the underlying cells. In bacterial tonsillitis the progression from colonisation to invasion appears to be related to alterations in the composition of the mucosal film and in the effectiveness of mucociliary action.

Acute bacterial tonsillitis is predominantly a disease of childhood, which reaches peak incidence in the fifth and sixth years of life. It occurs relatively infrequently in adolescents and adults. It may occur as a primary infection, originating in the tonsils, or as a secondary infection associated with a viral upper respiratory tract infection.

The typical primary tonsillitis due to haemolytic streptococcal infection is often accompanied by a sense of fullness in the throat and severe dysphagia, with pain radiating into the ears and, occasionally, anorexia. The voice may have a plummy quality. There are pains in the neck and there may be limitation of neck movement due to the upper deep cervical lymphadenopathy. The patient may complain of headaches and systemic symptoms such as general malaise and rigors due to fever.

On examination, there may be circumoral pallor. The tongue is furred and dry, and the breath fetid. The tonsils are swollen and red and often spotted with purulent exudates from the crypts (Figure 2) or, in severe cases, covered with a purulent pseudomembrane. There is an acute stasis of viscid mucus due to the patient's reluctance to swallow.

In the parenchymatous form of tonsillitis there is a livid swelling of the tonsils accompanied by oedema of the uvula and soft palate. It is important to note that odynophagia severe enough to prevent patients from swallowing their own saliva usually indicates a complication of acute bacterial tonsillitis, the most common being quinsy (peritonsillar abscess).

In the differential diagnosis of severe acute bacterial tonsillitis it is important to consider infectious mononucleosis. Early in the course of this disease a Paul Bunnell heterophile antibody titre may be negative and the blood film may not show the definitive characteristics of this infection (that is, a total lymphocytosis with atypical cells). Therefore, consider requesting Epstein–Barr virus serology.

Vincent's angina is essentially a subacute tonsillitis with ulceration; it represents spread of acute necrotising ulcerative gingivitis to the oropharynx. It is uncommon and, compared with acute tonsillitis, it is of slower onset and usually accompanied by less soreness in the throat and less fever. A sloppy membrane forms, usually in an ulcer, either on the tonsils or elsewhere in the oral cavity. Vincent's organisms (a fusiform bacillus and a spirochaete) may be cultured from direct throat swabs.

Other bacterial infections

Diphtheria is now rare and is unlikely to be confused with tonsillitis because it is a systemic disease with a circulating exotoxin. However, if anything, it is usually confused with acute membranous tonsillitis. It is important to remember that diphtheria is slow in onset and, at first, is accompanied by less constitutional disturbance and less local discomfort. The membrane of diphtheria, which may extend beyond the surface of the tonsil and onto the palate, is dirty grey. It is adherent and its removal causes bleeding. This is the characteristic difference between a true membrane and a pseudomembrane, as may be seen in infectious mononucleosis or bacterial tonsillitis.

Gonococcal pharyngitis cannot be distinguished from other infections on clinical grounds alone; if the history suggests the possibility of gonococcal pharyngitis, swabs should be taken and appropriate cultures performed. (Secondary syphilis may also cause an acute sore throat.)

Atypical bacteria such as *Mycoplasma pneumoniae* may be associated with acute sore throat. Often the sore throat is part of a systemic disorder, the main part of the symptom complex being due to pneumonitis or pneumonia.

Treatment

To swab or not to swab?

The routine use of throat swabs for bacteriology is not recommended because, in the absence of a pure growth or at least a heavy, near-pure growth, interpretation is very difficult. The oral cavity and the pharynx are always heavily colonised with a variety of bacteria, and if a mixed growth is obtained on swabs (as is often the case) it will provide no diagnostic information.

If a viral infection follows an atypical course – in that the patient develops signs consistent with bacterial infection – a throat swab may be considered. Again, it is only of clinical use if a pure or a heavy near-pure growth is obtained from the swab.

When is an antibiotic indicated?

Throat infections, whether bacterial or viral, are usually self-limiting, and the risks and benefits of antibiotic therapy should be discussed with the patient. *Therapeutic guidelines: antibiotic* suggest

Table. Causes of acute sore throat*

Infection
Viral
Bacterial
Fungal

Irritation
Tobacco smoke
Oral aerosol sprays used for asthma treatment
Chronic mouth breathing
Reflux pharyngolaryngitis

Systemic disease
Blood disorders (e.g. granulocytopenia, leukaemia)
Aphthous ulceration

* At least 50% of acute sore throats are caused by viruses and around 30% of the remaining cases are due to group A beta haemolytic streptococcal infection.

limiting antibiotic therapy (penicillin, or roxithromycin [Biaxsig, Rulide] for those who are hypersensitive to penicillin) to the following indications:[1]

- severe tonsillitis displaying diagnostic features suggestive of *Streptococcus pyogenes* infection (fever, tender cervical lymphadenopathy, tonsillar swelling or exudate, no cough)
- patients aged 2 to 25 years with presumptive streptococcal sore throat who live in communities with a high incidence of acute rheumatic fever
- existing rheumatic heart disease at any age
- scarlet fever
- peritonsillar cellulitis or abscess.

A low percentage of viral infections go on to develop a secondary bacterial infection and if there is a second phase infection comprising temperature, rigors and generalised malaise, together with either a throat swab showing a pure growth of a pathogen and/or a blood film consistent with acute bacterial infection, antibiotics are indicated.

Fungal infections

Although they do not commonly do so, a variety of fungal infections may present with acute sore throat. The fungus that is most commonly involved is *Candida albicans*. This diagnosis should be borne in mind in patients who have been taking broad spectrum antibiotics and in those who are diabetic or immunosuppressed.

Many small white patches develop on the buccal and pharyngeal mucosa. The condition may be asymptomatic, may give rise to slight discomfort or may be associated with considerable soreness and dysphagia or odynophagia. Treatment involves gargling with or sucking appropriate antifungal preparations.

Irritation

After infection, probably the most common cause of acute sore throat is irritation – usually by tobacco smoking, chronic mouth breathing or gastro-oesophageal reflux.

External irritants

The most common irritant is tobacco smoke, inhaled by active or passive smoking. A characteristic feature is acute erythema of the pharynx. Usually there are no local findings apart from hypertrophy of the lymphoid tissue along the posterior pharyngeal wall in Waldeyer's ring. The diagnosis is made on the history of the patient and the appearance of the throat. The pharyngitis may be difficult to control if the patient continues to smoke. Treatment involves humidifying and lubricating the pharynx with mouth washes.

A variety of other agents, most commonly oral aerosol sprays used for the treatment of asthma, may cause sore throats. These are commonly chronic but may be acute. Nonaerosol devices deliver active ingredients without the use of irritant propellants, and should be introduced if inhalations are suspected as the cause of an acute or chronic sore throat.

Chronic mouth breathing

Chronic mouth breathing is a common cause of acute and chronic sore throat. When air is inspired through the mouth it is not warmed, humidified or filtered. Consequently, the pharynx becomes dry, the mucociliary blanket is affected and the number of infections, both viral and bacterial, increases.

Mouth breathing in young children is most commonly due to postnasal obstruction; in adults, appropriate investigation of the nose and postnasal space must be undertaken to determine the cause. Treatment involves measures that will reinstate the mouth-closed posture and physiological nose breathing.

Reflux pharyngolaryngitis

Another common cause of acute or chronic sore throat is reflux pharyngolaryngitis. It is interesting to note that in half of the individuals with this condition there is no strong history of gastro-oesophageal reflux, waterbrash and aerophagy. Characteristically, the oral cavity, pharynx and posterior larynx are acutely inflamed and erythematous. There is a varying degree of tenderness, and often the patient is dysphagic. In some cases, there may be accompanying voice changes or patients may complain of chronic nonproductive cough.

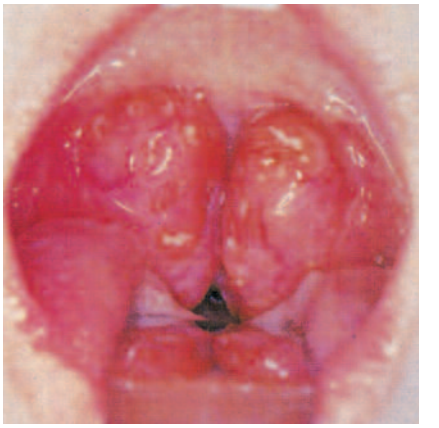

Figure 2. Tonsillitis – swollen red tonsils spotted with purulent exudates. Here, the tonsils are obstructing the airway.

Where reflux is the cause, the diagnosis is often missed and this group of patients has often been subjected to multiple treatments, usually with repeated courses of antibiotics and topical oropharyngeal medications.

Diagnosis is based on physical examination of the pharynx and direct viewing of the larynx by nasolaryngoscopy. The laryngeal changes are characterised by erythema and swelling of the mucosa over the arytenoids and interarytenoid bar, and perhaps posterior glottic pathology. Definitive diagnosis is by dual-level ambulatory 24-hour pH probing (available through most otolaryngology and gastroenterology clinics).

Appropriate treatment is the administration of vigorous antireflux medication using proton ion pump inhibitors,

plus or minus gastric motility enhancing agents. Patients should also be advised to avoid repeated throat clearing (by keeping water handy to sip) and undertake antireflux lifestyle changes (such as avoiding caffeine, alcohol and fatty or spicy foods and leaving three hours between eating and going to bed).

Systemic diseases

Systemic blood disorders

If the acute sore throat is associated with any mucosal bleeding, the attending clinician should be alerted to the possibility of an underlying sinister condition, such as acute leukaemia.

Systemic blood disorders such as granulocytopenia and leukaemia may be accompanied by necrotising lesions on the tonsils which resemble those seen in acute membranous tonsillitis or infectious mononucleosis. Ulceration is usually present elsewhere in the mouth and oropharynx and is characterised by the absence of a surrounding inflammatory reaction. The obvious severity of the patient's general condition in these disorders means that they are unlikely to be confused with typical tonsillitis. Treatment involves gargling with or sucking appropriate topical preparations.

Acute sore throats associated with systemic disorders are uncommon, and treatment in these cases should be directed at the underlying cause.

Recurrent aphthous ulceration

Recurrent aphthous ulceration can cause acute sore throat of a varying degree of severity. There is no known definitive cause. Viruses and psychogenic and endocrine disturbances are implicated in the aetiology of this condition, but most of the recent work indicates that it is probably the result of gastro-oesophageal reflux and/or viral reactivation.

Small vesicles are the first signs to appear, but these may not be noticed. Ulceration soon occurs, leaving a lesion the size of which may vary from that of a pinhead to 2 to 3 cm across. There may be a single lesion or several, occurring in all parts of the oral cavity and pharynx. The ulcers tend to have a sloughing base and a marked area of hyperaemia around the edges. They are usually extremely painful and last for several days.

Small isolated lesions may require no treatment other than local antiseptic and analgesic lozenges. In more severe cases, hydrocortisone lozenges (Corlan pellets) have been used. It is important to pay attention to oral hygiene. If the condition persists, local application of a caustic agent, such as phenol or silver nitrate, usually promotes healing and alleviates the pain.

Conclusion

The majority of acute sore throats are due to viral illness. The next most common cause is tonsillitis due to group A beta haemolytic streptococcus. On clinical grounds it is very difficult to differentiate a viral from a bacterial infection, and in most cases sore throat infections, whether bacterial or viral, are self-limiting. Treatment is directed mainly at symptomatic relief. Noninfective causes, such as irritation, should be considered if the sore throat persists.

If the acute sore throat is associated with any mucosal bleeding or the patient is generally very unwell, an underlying systemic disorder should be considered. MT

Reference

1. Therapeutic guidelines: antibiotic. Version 11. Melbourne: Therapeutic Guidelines Limited, 2000.