

Acute Rhinosinusitis

Objectives

- To understand the definition of ARS
- How to treat it
- Know what are the complications of it

Definition

Acute rhinosinusitis (ARS) is an acute inflammatory condition of the nose and paranasal sinuses. As the mucosal lining of the nose and paranasal sinuses are continuous, ARS is a more appropriate term than the traditionally used acute sinusitis. ARS is defined as (European Position Paper on Rhinosinusitis and Nasal Polyps – EPOS):

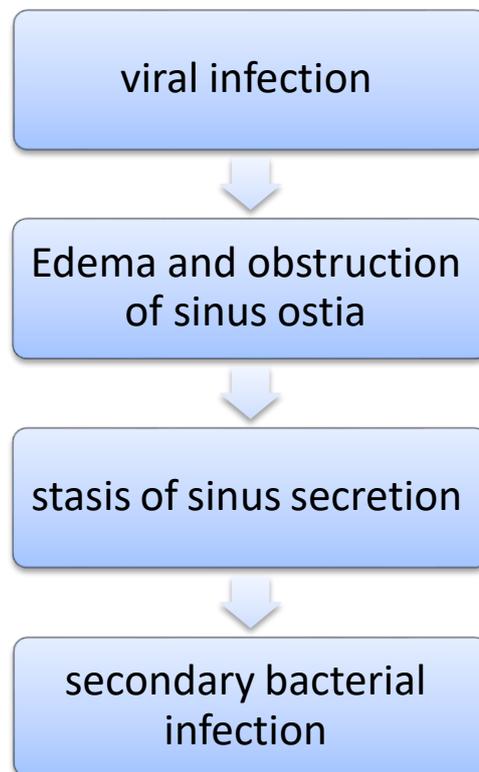
- Sudden onset of two or more symptoms, one of which should be either nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip)
± Facial pain/pressure
± Loss/reduction of sense of smell
- Symptoms lasting less than 12 weeks

This differs in children in that they should have sudden onset of two or more of the following symptoms:

- Nasal blockage/obstruction/congestion
- Or discoloured discharge
- Or cough (daytime and nighttime)

Pathophysiology

ARS usually develops as a result of a preceding viral upper respiratory tract infection which leads secondarily to a bacterial infection. Most of the sinuses drain in the middle meatus and congestion and obstruction of this part of the sinonasal anatomy is often implicated in ARS. The most commonly implicated bacterial pathogens are the pyogenic or pus-forming organisms such as *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*. Presence of atopy, anatomical abnormalities (such as septal deviation and mechanical obstruction to sinus drainage pathways) and a history of chronic rhinosinusitis (with or without nasal polyposis) may predispose some individuals to developing ARS. Sinonasal tumours and foreign bodies can also cause mechanical obstruction. Conditions affecting mucociliary clearance (e.g. cystic fibrosis, Kartagener's syndrome) as well as immunodeficiency disorders are also risk factors for recurrent ARS.



Clinical features

The diagnosis of ARS is predominantly based on clinical history and examination. Patients usually present with a history of a preceding coryzal illness with clear rhinorrhoea, nasal congestion, fever and malaise, followed by development of symptoms of ARS:

- Prurulent rhinorrhoea
- Nasal congestion (more marked)
- Facial pain and/or pressure
- Hyposmia or altered taste
- Dental pain.

On examination, there is often mucopus in one or both nasal cavities. Gentle palpation of the surface of the involved sinus can be painful. The patient may complain of a severe headache, particularly over the frontal region.

Treatment

Treatment is aimed at symptom control and prevention of disease progression and complications. Most cases of ARS can be managed in the primary care setting with good analgesia, decongestants and appropriate antibiotics. However, a high index of suspicion needs to be maintained in resistant or nonresponsive cases for development of complications – in such scenarios an early specialist ENT opinion is advisable. Broadly speaking, the treatment of ARS includes:

- Analgesics (paracetamol ± non-steroidal anti-inflammatory drugs)
- Decongestants (topical and/or systemic)
- Antibiotics (e.g. amoxicillin, cephalosporins)
- Rarely, surgical intervention.

Complications

Most cases of ARS resolve without adverse effects. The anatomical location of the nose and paranasal sinuses, however, means that the infection can spread to adjacent areas. The most frequent complication of ARS, most notably in children, is development of periorbital cellulitis . Infection can spread directly through the thin bone separating the sinuses from the orbit (lamina papyracea) or by venous thrombophlebitis. If not treated promptly, this can rapidly progress to orbital cellulitis, subperiosteal and/or orbital abscess formation, blindness and cavernous sinus thrombosis, which can be fatal. An urgent specialist review and, in most cases, hospital admission for intravenous antibiotics and monitoring of visual acuity is required if any degree of orbital involvement is suspected. As inpatients, these cases are managed in a multidisciplinary manner with involvement from ENT surgeons, ophthalmologists and paediatricians in the case of children. Radiological imaging (CT scanning) is utilised in patients who have severe symptoms at the outset or in those whose symptoms continue to progress or do not respond to maximal medical therapy. Surgical intervention is required if there is evidence of abscess formation.

Osteomyelitis, meningitis, extradural/subdural and intracranial abscesses can also be sequelae of ARS . Osteomyelitis of the frontal bone can result in the formation of a subperiosteal abscess on the forehead and is referred to as ‘Pott’s puffy tumour’. Subdural abscess is the most common intracranial complication. It may occur via direct extension through the posterior wall of the frontal sinus or infection may spread through thrombophlebitis of the valveless veins.

Delayed diagnosis can result in long-term neurological deficits and even fatality. A long-standing untreated sinus infection can cause persistent chronic obstruction to

the drainage pathway of the sinus so that the bone expands and causes an external deformity – known as a mucocele.

Table 5. Complications of Acute Sinusitis

Bony

Osteomyelitis

Pott's puffy tumor

Intracranial

Cavernous sinus thrombosis

Epidural abscess

Intracranial abscess

Meningitis

Subdural abscess

Superior sagittal sinus thrombosis

Orbital

Cavernous sinus thrombosis

Inflammatory edema and erythema (preseptal cellulitis)

Orbital abscess

Orbital cellulitis

Subperiosteal abscess

Pitfalls and pearls

- M/C Sinus involved in adults in order of frequency: Maxillary > Frontal > Ethmoid > Sphenoid
- M/C sinus involved in children = Ethmoidal sinus
- In acute sinusitis—diagnosis is mainly made on clinical ground and there is little role for imaging
- The first investigation usually done in past was plain X-ray but it is not done nowadays. The plain CT scan without contrast is the first line of screening study of the nose and paranasal sinuses these days