

ACUTE AND CHRONIC RHINOSINUSITIS

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Abstract: *Acute sinusitis (ARS) and chronic rhinosinusitis (CRS) is a common condition worldwide. CRS is due to the infection and inflammation of paranasal sinuses. Frequent clinical manifestations of ARS include persistent symptoms with nasal discharge or cough or both, presentation with fever accompanies purulent nasal discharge, and worsening symptoms. Complications of CRS have five stages, preseptal cellulitis, orbital cellulitis, subperiosteal abscess, orbital abscess and cavernous sinus septic thrombosis. Most acute sinusitis generally of viral origin, e.g. rhinoviruses, corona viruses, and influenza viruses. Bacterial pathogen include Streptococcus pneumonia, Haemophilus influenza and Moraxella catarrhalis. Bacteria found in biofilms have their antibiotic resistant increased up to 1000 times when compared to bacteria free living of same species.*

Key words: *Chronic Rhinosinusitis, Pathophysiology and Treatment.*

Sinusitis, also known as rhinosinusitis, is inflammation of the paranasal sinuses. It can be due to infection, allergy, or autoimmune problems. Most cases are due to a viral infection and resolve over a course of 10 days. It is a common condition, with over 24 million cases in the United States [1]. Evidence of maxillary sinusitis has been found in human archeological specimens discovered in Africa, North America, and Europe [2]. Hippocrates recognized the association between high arched palate, nasal obstruction, headache, and discharging ears-probably what today would be called rhinosinusitis associated with otitis media. The first accurate description of the paranasal sinuses was by Vesalius in the 16th century, and the first documented cases of documented cases of supportive sinusitis were by Antonio Molinetti in Venice in 1697[3]. Classification of sinusitis or rhinosinusitis include a) acute rhinosinusitis- a new infection that may last up to four weeks and can be divided symptomatically into severe and non-severe; b) recurrent acute rhinosinusitis four or more separate episodes of acute sinusitis that occur within one year; c) sub-acute rhinosinusitis- an infection that lasts between four and 12 weeks, and represents a transition between acute and chronic infection) chronic rhinosinusitis - when the signs and symptoms last more than 12 weeks; and e) acute exacerbation of chronic rhinosinusitis exacerbate, but return to base line treatment. All these types of sinusitis have similar symptoms, and are thus difficult to distinguish. Acute sinusitis is very common. Roughly ninety percent of adults have had sinusitis at some point in their life [4,5].

Diagnosis of acute bacterial or viral sinusitis by imaging, X rays, computed tomography (CT) or magnetic resonance imaging (MRI) is generally not recommended unless complications develop, for chronic sinusitis nasal endoscopy, and clinical symptoms are also used to make positive diagnosis [6,7], A tissue sample for histology and cultures also be collected [8].

Cultures obtained via endoscopy or by sinus aspiration, bacterial pathogens isolated in order of frequency include *Streptococcus pneumoniae*, *Haemophilus influenzae*, Anaerobes, *Streptococcal spp*, *Moraxilla catarrhalis*, *Staphylococcus aureus*, methicillin resistant *Staphylococcus aureus* (MRSA) and others [9]. There is

limited evidence to support short treatment with oral corticosteroids for chronic rhinosinusitis with nasal polyps [11]. Surgery should only be considered for those people who do not benefit with medication [11]. The paper reviews the current literature, pathophysiology and treatment of acute and chronic rhinosinusitis.

Pathogenesis of rhinosinusitis involves three key elements: narrow sinus ostia, dysfunction of the ciliary apparatus, and viscous sinus secretions. The narrow caliber of the sinus ostia sets the stage for obstruction to occur. Factors that predispose the ostia to obstruction include those that result in mucosal swelling and those that cause direct mechanical obstruction. Of these multiple causes viral upper respiratory infection (URI) and allergic inflammation are the most frequent and most important. During episodes of acute rhinitis, a completely patent ostia is present only 20% of time [12]. When obstruction of sinus ostium occurs, there is transient increase in pressure within the sinus cavity. As oxygen is depleted in this close space, the pressure in the sinus becomes negative relative to atmospheric pressure. This negative pressure may allow the introduction of nasal bacteria into sinuses during sniffing or nose blowing [13]. When obstruction of the sinus ostium occurs, secretion of mucus by mucosa continues, resulting in accumulation of fluid in the sinus. A study of adult volunteers investigated the role of nose blowing in introducing nasal fluid, and possibly microbes with the fluid, into the sinus cavities.

Acute sinusitis Bacterial and viral sinusitis are difficult to distinguish. However, if symptoms last less than 10 days, it is considered viral sinusitis. When symptoms last more than 10 days, it is considered bacterial sinusitis [6]. Imaging by either, CT or MRI is generally not recommended unless complications develop. Pain caused by sinusitis is sometimes confused for pain by pulpitis (toothache) of maxillary teeth, and vice versa. Classically, the increased pain when tilting the head forwards separates sinusitis from pulpitis [6].

For sinusitis lasting more than 12 weeks a CT scan is recommended [6]. Nasal endoscopy, and clinical symptoms are also used to make a positive diagnosis [7]. A tissue sample for histology and cultures can also be collected and tested. Allergic

fungal sinusitis (AFS) is often seen in people with asthma and nasal polyps. In rare cases, sinusoscopy may be made. Nasal endoscopy involves inserting a flexible fiberoptic tube with a light and camera at its tip into the nose to examine the nasal passages and sinuses. This is generally a completely painless (although uncomfortable) procedure which takes between five to ten minutes to complete [8]. A meta-analysis of studies comparing plain radiographs with sinus puncture and culture demonstrated a sensitivity of 90% and specificity of 61% for plain radiograph. In summary, the diagnosis of acute sinusitis should be made on clinical grounds in most patients. CT of sinuses is useful for evaluation of patients with infraorbital or intracranial complications of sinusitis and for the evaluation of patients in whom sinus surgery is being considered [32]. Magnetic resonance imaging may have a role in the diagnosis of fungal rhinitis and is useful in diagnosis of intracranial complications of sinusitis [15].

Decongestant nasal sprays containing for example oxymetazolin may provide relief, but these medications should not be used for more than the recommended period. Longer use may cause rebound sinusitis.

In conclusion, Acute and chronic rhinosinusitis have similar symptoms, although acute sinusitis is more common. Studies to correlate signs and symptoms with radiographic or culture results, have methodologic issues.

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