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Review Article

Acute Rhinosinusitis: A Review of Clinical Presentation, Evaluation, Management

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Abstract

In urgent care, one of the most prevalent conditions that providers encounter is Acute Rhinosinusitis. Viral upper respiratory infections are the leading cause of acute rhinosinusitis cases and have a significant socioeconomic impact.

Key Points

The following are the main ideas of this project:

1. To provide a succinct overview and definition of acute rhinosinusitis.
2. Discuss the clinical presentation and pathophysiology.
3. Provide an overview of the history and physical examination.
4. Discuss potential red flag symptoms.
5. Review different classifications of the disease.
6. Discuss the epidemiology and diagnosis of the disease.
7. Provide treatment options.

Introduction

One in seven adults in the United States is diagnosed with rhinosinusitis each year, accounting for almost 30 million cases1. Acute Rhinosinusitis (ARS) ranks as the sixth most prevalent condition for which prescription antibiotics are written. The annual direct cost associated with treating both acute and chronic sinusitis exceeds $11 billion, not accounting for the financial burden of missed work due to illness [1]. Acute rhinosinusitis is a potentially 12-week-long inflammatory condition that affects the nose and paranasal sinuses. The primary initiating factor is a viral infection, commonly known as a common cold. This infection can persist over time (post-viral), and a small percentage of patients may also develop a bacterial infection [2]. Differentiating between the various ARS phenotypes is crucial to comprehending the needs for diagnosis and treatment in each patient [2]. Despite the fact that ARS typically resolves on its own and has a very low incidence of chronicity or sequelae, it can significantly lower quality of life [2]. This leads to overprescribing antibiotics by both general practitioners and ENT specialists.

Definition of Acute Rhinosinusitis

Based on the duration of symptoms, the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) divides rhinosinusitis into subgroups.1 Rhinosinusitis is classified as:

(1) acute when symptoms last less than four weeks, (2) subacute when symptoms last between four and twelve weeks, and (3) chronic when symptoms remain beyond twelve weeks.1 There are two further classifications for acute rhinosinusitis: bacterial and viral.1 Acute rhinosinusitis is a medical condition that should be considered when there are two or more nasal symptoms[2]. Nasal congestion, blockage, obstruction, or rhinorrhea (anterior or post-nasal drip) should be one of the symptoms, and the other symptoms could be reduction/loss of smell or facial pain/pressure that lasts for up to 12 weeks [2].

Clinical Presentation and Pathophysiology

The most prevalent cause of rhinosinusitis is a viral upper respiratory infection, which results in thick mucus production, nasal lining inflammation, and edema that clogs the paranasal sinuses and promotes secondary bacterial overgrowth [3]. The sphenoid, ethmoid, frontal, and maxillary sinuses are commonly affected. A higher mucus viscosity brought on by ciliary immobility may further obstruct drainage.8 Nose blowing and coughing cause bacteria to enter the sinuses [3]. Bacterial sinusitis can develop following a viral upper respiratory infection, with symptoms either getting worse after five days or becoming persistent after ten [3].

History and Physical

A thorough history and physical examination are necessary to evaluate the patient with acute rhinosinusitis. Acute sinusitis patients exhibit symptoms that have persisted for less than four weeks. A few symptoms that may be specific to this condition are headache, halitosis, facial pain or pressure, posterior or anterior nasal purulence, blockage, hyposmia, anosmia, fever, and dental pain. The three "cardinal" symptoms of purulent nasal discharge combined with either nasal obstruction or facial pain, pressure, or fullness are the most sensitive and specific indicators of acute rhinosinusitis [4]. Patients who explicitly present with complaints of "headache" should explain this specifically [4]. With the rare exception of sphenoid sinusitis, which typically manifests as a chronic occipital or vertex headache, isolated headaches are not indicative of sinusitis; rather, facial pressure is [4]. To ascertain the precise symptoms the patient is experiencing, the astute practitioner needs to obtain this history from them [4].

During the physical examination, the healthcare provider can observe erythema on anterior rhinoscopy, turbinate hypertrophy, anterior or posterior purulent rhinorrhea, or mucosal congestion. Palpation of the frontal, ethmoid, or maxillary sinuses may reveal external pain [5]. The patient may have widespread facial pain and be febrile or tachycardic [5]. Mucopustular discharge coming from the osteomeatal complex may be seen on anterior rhinoscopy [5]. Though uncommon, ocular cellulitis, preseptal cellulitis, or cavernous sinus thrombosis can occur in some patients who have acute sinusitis [5]. To rule out these issues, cranial nerve testing and a detailed examination of the orbit should be carried out [5].

Red Flags

The frequency of problems related to acute bacterial rhinosinusitis has been reported to be roughly 3:1,000,000 per year [2]. It has been shown that using antibiotics does not shield against complications.2 ABRS complications are categorized as ocular (60-80%), intracranial (15-20%), and rarely osseous (5%) [2]. The most frequent ABRS-related problems are orbital ones, which are caused (in decreasing order) by frontal, ethmoid, maxillary, and infrequently, sphenoid sinusitis [2].

A complication should be ruled out when a patient exhibits any one of the following indications and/or symptoms: periorbital edema/erythema, evidence of infection, a displaced globe, double vision, ophthalmoplegia, decreased visual acuity, intense headache, frontal swelling, or other neurological symptoms [2].

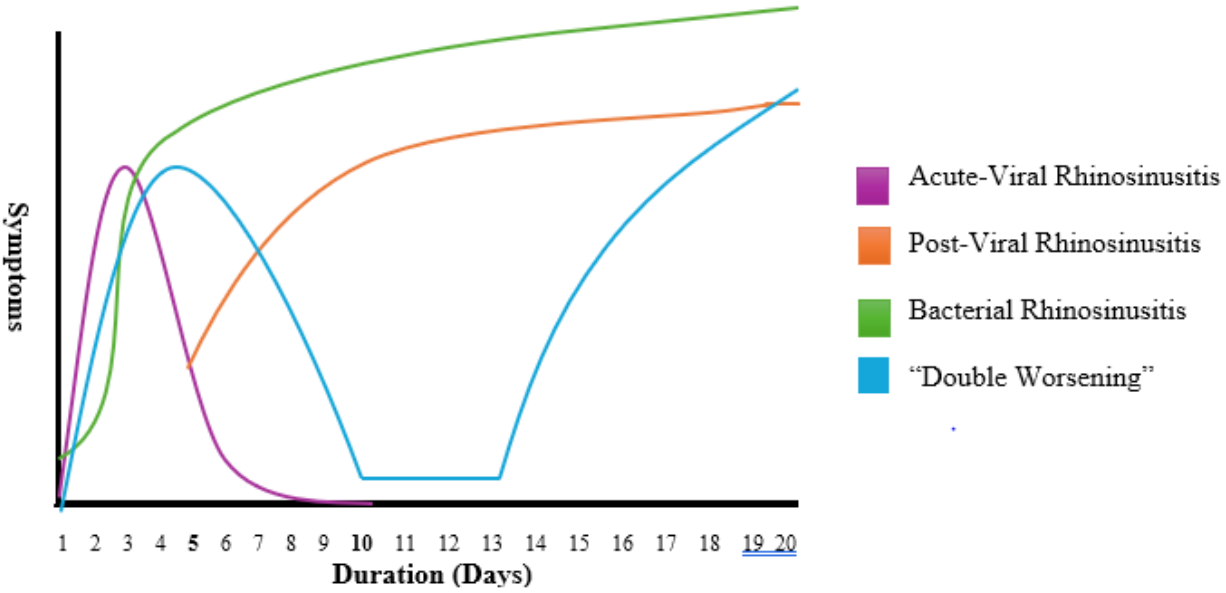
Complications from rhinosinusitis can include pre-septal or orbital cellulitis, abscess formation, meningitis, cavernous sinus thrombosis, and osteomyelitis when it extends outside the nasal cavity and sinuses to affect the orbit, neurological system, or other surrounding structures [6].

Headache, nausea, vomiting, fever, and altered mental status are indicators of central nervous system involvement, such as meningitis or intracranial abscess [6]. Palsy of cranial nerves III (oculomotor), IV (trochlear), or VI (abducens) should raise suspicions about cavernous sinus involvement [6]. Patients with these symptoms should be checked out immediately to determine whether they have a complex infection [6].

Classification of Acute Rhinosinusitis

Three primary clinical phenotypes of the illness might manifest: (1) viral acute rhinosinusitis, often known as the common cold, (2) post-viral acute rhinosinusitis, and (3) acute bacterial rhinosinusitis. Viral acute rhinosinusitis is when the event lasts for up to 10 days. Post-viral acute rhinosinusitis is when symptoms intensify or continue for more than 5 days [2]. Acute bacterial rhinosinusitis is suspected when symptoms persist for more than ten days without showing any signs of clinical improvement when they follow a biphasic pattern and get better for five to six days, then get worse again (a condition known as "double worsening"), or when symptoms are severe and include fever exceeding 39°C (102°F), purulent nasal discharge, or persistent facial pain that lasts for more than four days [6]. Nearly 80% of cases of acute bacterial sinusitis are preceded by a viral upper respiratory infection [5]. Usually, viral diseases resolve in three to five days.5 Only 0.5% to 2% of rhinosinusitis cases are caused by bacterial infections [6] (Table 1).

Table 1: Classification of Acute Rhinosinusitis.



Epidemiology

Acute rhinosinusitis is more common in the Midwest, the South, and among women [3]. Most affected are adults between the ages of 25 and 64.8 Existing research shows wide variations in the prevalence of acute rhinosinusitis in the general population [4]. The common cold, or acute viral rhinosinusitis, is a very common illness that affects people two to five times a year on average [4]. One in eight individuals will be diagnosed with sinusitis at some point in their lifetime, making sinusitis one of the most prevalent disorders for which patients seek medical attention [3]. Twenty percent of antibiotic prescriptions are written for sinusitis [5]. In the United States, sinusitis was diagnosed in thirty million instances in 2015[5]. The direct cost of treating sinusitis is over $11 billion, with $3 billion going toward treating acute cases and $8.3 billion going toward treating chronic cases [5].

Diagnosis

Acute rhinosinusitis is primarily a clinical diagnosis [4]. Diagnosing acute rhinosinusitis is a multi-step process that includes getting a medical history, doing a physical examination, and analyzing the results to determine the most likely cause of the condition. The process could also include radiographic images and diagnostic testing. In most cases, routine laboratory testing is not required [4]. The gold standard is the culture of endoscopic aspirates that have more than or equal to 10 CFU/mL [4]. But in most ABRS cases, this is not done and is not necessary for diagnosis. The minimal association between nasal and nasopharyngeal cultures and endoscopic aspirates renders them of limited use [5]. Imaging is not required for acute sinusitis unless a different diagnosis or a clinical concern for a complication exists [5]. In general, sinus plain films are not helpful for identifying inflammation although they may display air-fluid levels [5]. This is insufficient to distinguish between bacterial and viral etiologies [5]. To check for bone, soft tissue, dental, or other structural abnormalities, or the presence of chronic sinusitis, sinus CT imaging should be performed if a complication or other diagnosis is suspected, or if the patient experiences repeated acute infections [5].

Treatment

Since viral rhinosinusitis is a self-limited illness, symptom alleviation and avoiding unnecessary prescription antibiotics are the main goals of medical treatment [1]. For acute rhinosinusitis, practitioners frequently overprescribe antibiotics [1]. The AAO-HNS's clinical practice guideline suggests using antibiotic medication and cautious waiting as the first lines of treatment for acute bacterial rhinosinusitis [1].

When follow-up is available, it is wise to avoid antibiotics for seven to ten days following the onset of upper respiratory symptoms in favor of watchful waiting [1]. If the patient's symptoms fail to improve in seven to ten days after first presenting, or if symptoms increase at any point, antibiotic medication should to be taken into consideration [1]. Patients who are being observed should be offered symptomatic therapy [1]. Medical professionals may also write a delayed prescription, commonly known as a safety net antibiotic prescription, for these patients along with instructions on when to fill it [1].

After seven days, with or without antibiotic medication, 47% of patients with bacterial rhinosinusitis said that their symptoms had subsided, according to a Cochrane analysis.1 Without the use of antibiotics, almost 70% of patients recovered in less than two weeks [1]. Compared to a placebo, antibiotic therapy did improve cure rates for patients in the seven to fifteen-day range; however, the clinical advantage was minimal, with just 5% of patients experiencing a speedier recovery [1].

According to most guidelines, amoxicillin, either with or without clavulanate, is the first-choice antibiotic for adults due to its restricted microbiologic spectrum, safety, and affordability [1]. Patients with moderate to severe infection and those with concomitant disorders and a high risk of bacterial resistance should utilize amoxicillin/clavulanate [1]. There are no appreciable variations in the rates of cure for acute bacterial rhinosinusitis across various antibiotic classes [1]. It is not advised to use respiratory fluoroquinolones as first-line antibiotics due to their numerous side effects and lack of advantage over beta-lactam antibiotics [1]. Reserving fluoroquinolones for patients without alternative treatment choices is advised, per a recent U.S. Food and Drug Administration safety advisory [1]. The initial treatment for acute bacterial rhinosinusitis no longer involves macrolides such as azithromycin (Zithromax), and second or third-generation cephalosporins, due to the high rates of resistance in S. pneumoniae and H. influenzae [7].

Symptomatic treatment options include nasal washing, humidification, and topical or systemic decongestants such as pseudoephedrine [3]. Recall that oral decongestants should be used cautiously in individuals with hypertension and that oxymetazoline should not be administered for longer than three days due to rebound congestion [3]. Antihistamines can cause poor drainage and have not been proven to be helpful [3]. Topical steroids are more effective in treating chronic sinusitis, but they are also utilized to reduce nasal mucosal edema [3].

Conclusion

Acute rhinosinusitis (ARS) is a common cause of illness and visits to urgent care facilities and primary care offices. Symptoms appear suddenly and last no more than 12 weeks. Different etiologies of ARS can be identified based on symptoms, indications, and duration. Most acute sinusitis episodes, regardless of their bacterial or viral cause, resolve within 10 to 14 days. It is critical that healthcare professionals comprehend the many forms, clinical presentations, and possible treatments. Antibiotic resistance is exacerbated by over-prescription of antibiotics due to misunderstanding of ARS. Due to the significant indirect expenses associated with ARS, the excessive number of medical appointments, improper use of diagnostic testing, and abuse of medicine, the disease has an extremely high economic burden. One unmet need that is necessary to lower the high costs of this condition is to educate patients and providers about the idea that ARS is a benign disease that typically resolves on its own [8].

Acknowledgement

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Conflict of Interest

None.

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