

GENERAL SURGERY

11-3-2014 >>>> [[SHEET # 4]]

***Note ***: this sheet includes the slides and extra notes >> and what the dr were mentioned are in the bold font ☺

Acute Rhinosinusitis

- **Sinusitis** commonly used for any inflammation or infection of paranasal sinuses
- This term has largely been replaced by rhinosinusitis because the nose is almost always involved with the infection or inflammation at the same time as the sinuses
- Because we can't separate the paranasal sinuses from the nasal cavity, any inflammation in the nasal cavity (rhinitis) usually associated with sinusitis to give us (rhinosinusitis) .

- **Classification**

A) Rhinosinusitis is usually divided to 4 parts according to its duration to:-

- Acute rhinosinusitis(<4weeks)
- Sub acute(4-12 weeks)
- Chronic(>12weeks)
- Recurrent Acute (If it attacks more than one time ..ex. 4 time per year)

B) Acute sinusitis is also classified according to its etiology to :-

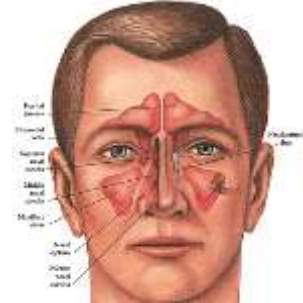
- Viral
- Bacterial

And this is important in the management of sinusitis

Epidemiology

Acute sinusitis affects 3 in 1000 people .

- More common in winter than in summer. But there is a variation
(Rhinoviral infections are prevalent in autumn and spring. Coronaviral infection occurs mostly from December to March)
- Women have more episodes of infective sinusitis than men (because women deal with children which are more susceptible to get infection).



In this pic we can see

- ➡ Frontal sinus
- ➡ Maxillary sinus
- ➡ Ethmoid sinus

In this pic we can see

- ➡ Sphenoid sinus

both are located in the base of skull



- ➡ Lateral wall of nasal cavity (which has 3 projections (conchae))
 - Inferior , middle and superior

- Between inferior and middle conchae the middle meatus is located (a drainage of ant ethmoid , frontal and maxillary sinus
- Between middle and superior conchae the superior meatus is located (a drainage of post ethmoid)
- Above superior conchae sphenoidal recess is located (a drainage of sphenoid sinus)

What previously mentioned are imp ..to know from where the drainage come from.

Usually sinusitis starts with infection (viral or bacterial) which leads to edema → the ostium of sinus become narrower → inflammation will increase the goblet cells secretion → which will drain in the nasal cavity → O₂ will decrease and CO₂ will increase → increasing infection and the cycle continue

- If the infection remains more than 12 weeks → chronic sinusitis .

Etiology

Cause	Organism	Frequency
Virus	Proportion of total acute rhinosinusitis (ARS) cases	39%–87%*
	Proportion of viral pathogen recovered on sinus puncture:	
	Rhinovirus	15%
	Influenza virus	5%
	Parainfluenza virus	3%
	Adenovirus	2%
Bacteria	Proportion of total ARS cases	0.05%–2%
	Proportion of each bacterial species in acute bacterial rhinosinusitis (ABRS):	20%–43%
	<i>S. pneumoniae</i>	22%–35%
	<i>H. influenzae</i>	2%–10%
	<i>M. catarrhalis</i>	2%–6%
	Anaerobes	<5%
	<i>S. aureus</i> and <i>Streptococcus pyogenes</i>	

Viral infection → the most common (39%-89%)and the most common viruses are Rhinovirus ,influenza and paranasal influenza viruses

- Symptoms or signs are present for < 10 days
- Not worsening

Bacterial infection → 0.05 % -2%.... (*S.pneumoniae* , *H influenza* –not type B- has not effective vaccine , *M catarrhalis* and anaerobes).

- **Symptoms or signs are present for > 10days**
- **Worsening with time**

Predisposing factors

❖ Local

- **URI (upper respiratory infection)**
- **Allergic rhinitis**
- **Congenital defects ,Nasal septal defects (such as deviation of nasal cavity)**
- **Barotrauma (diving)**
- **Nasal foreign bodies**
- **Nasal tubes**
- **Dental infections**
- **Overuse of topical decongestants**
- **Nasal polyps or tumors**
- **Aspiration of infected water**
- **Smoking**

❖ Systemic

- **Diabetes**
- **Immunocompromise (AIDS)**
- **Malnutrition**
- **Blood dyscrasias**
- **Cystic fibrosis**
- **Chemotherapy**
- **Long term steroid Rx**

Clinical presentations

- Symptoms progress over 2 to 3 days
- **Nasal congestion & discharge** (usually thick & colored, not clear)
- **Localized pain +/- referred pain** (pain according to location of sinus)
- **Tenderness or pressure sensation over sinuses**
- **Headache**
- **Cough due to postnasal drip**
- **Halitosis**
- **Malaise**

Physical findings

If we examine the nasal cavity we will find

- **Erythematous edematous nasal mucosa**
- **Purulent secretions in middle meatal area**
- **May be absent if ostia completely blocked**
- **Percussion tenderness over the involved sinuses**
- **Over the maxillary molar +/- premolar teeth**
- **Halitosis**
- **+/- fever**

Pain pattern in acute sinusitis

- **Maxillary sinusitis**
- **Unilateral pain over cheekbone**
- **Maxillary toothache**
- **Periorbital pain**
- **Temporal headache**
- **Pain worse if head upright**
- **Pain better if head supine**

- **Ethmoid sinusitis:**

- Medial canthal pain
- Medial periorbital or temporal headache
- Pain worsening by valsava or if supine (the pt feels pressure on his nose)

- **Sphenoiditis (in the base of skull)**

- Retroorbital , temporal or vertical headache
- Often deep seated headache with multiple foci

- **Frontal sinusitis:**

- Frontal pain
- Worse in supine position

In the morning the symptoms are mild

And in the afternoon the symptoms are worse and we call it (office headache).

Signs of potentially dangerous complications

Be careful if one of these symptoms are seen during examination

- Periorbital , frontal ,cheek swelling
- Proptosis
- Ophthalmoplegia (orbital complication ,cavernous sinus involvement)
- Ptosis
- Meningeal signs
- So when we detect such signs we refer the pt to doctor to treat these complications .

Major and Minor Factors in diagnosis of rhinosinusitis (1997 Task Force)

- Major factors:

- Facial pain and pressure
- Facial congestion or fullness
- Nasal obstruction or blockage
- Nasal discharge , purulence ,or discolored postnasal drainage
- Hyposmia or anosmia
- Purulence in nasal cavity

➤ **Fever (in acute sinusitis)**

The chronic sinusitis has the same factors but without fever

● **Minor factors:**

- Headache
- Halitosis
- Fatigue
- Dental pain
- Cough
- Ear pain , pressure ,fullness
- The presence of 2 major or 1major and 2 minors or 3 minors strongly suggests the diagnosis.

Viral Vs Bacterial Acute Sinusitis

- **The diagnosis of acute bacterial sinusitis be entertained when :**
- Symptoms or signs of acute rhinosinusitis are present 10 days or more beyond the onset of upper respiratory symptoms
- **Symptoms or signs of acute rhinosinusitis worsen within 10 days after an initial improvement.**
- A history of purulent secretions and **facial or dental pain are specific symptoms may point to a bacterial etiology.**
- **In a patient in intensive care(ICU), acute bacterial sinusitis should be suspected in the presence of sepsis of unknown origin.**

Tests appear to add little to the predictive value of clinical findings in the diagnosis.(diagnosis usually is a clinical diagnosis ..which means it doesn't depend on the test that much)

From these tests :

Radiography (plane films or CT)

- Imaging studies are not necessary when the probability of sinusitis is either high or low but may be useful when the diagnosis is in doubt, based upon a thorough history and physical examination.
- **Plain films not as sensitive as CT (CT more accuret)**

- **Radiographic signs of sinus pathology :**

- **Air fluid levels**
- **Partial or complete opacification**
- **Bony wall displacement**
4 mm or more of **mucosal wall thickening**

We see air fluid level in the left side →



← **Complete opacification on the left side and air fluid level in the right side**

Opacification of frontal sinus →



Limitations of plain films include :

- **Interobserver variability**
- **Inability to distinguish infection from a polyp or tumor disease**
- **Poor depiction of the ethmoid and sphenoid sinuses**

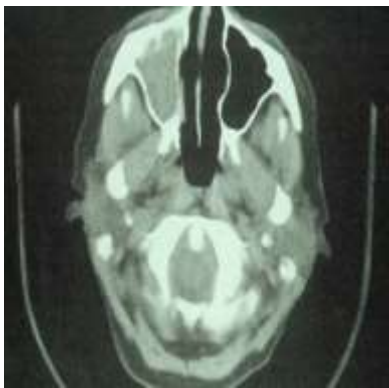
CT scan: (more specific than plane film)

- **Advantages of CT :**
- **Visualizes ethmoid air cells**

- Evaluates cause of opacified sinus
- Differentiates bony changes of chronic inflammation from osteomyelitis
- The problem with CT is that the dose of radiation is high and it is expensive
- We don't do it routinely
- Indicated only if complications suspected or if diagnosis uncertain (not needed initially for most cases)



Coronal CT : we can see maxillary sinuses , ethmoidal sinus , and fluid in both sides >> this indicate the presence of acute sinusitis



Axial section : we see opacification of maxillary sinuses because the radiograph is in horizontal plane ..we can't see the air fluid level .

Also for diagnosis we can use

Nasal endoscope

- Visualize posterior sinonasal structures.
- This test is useful to help exclude structural

lesions, fungal disease, and granulomatous diseases

the another test are not that imp unless we doubt of underling cause

Lab tests

- Not indicted routinely.
- May include:
 - Blood tests

- Nasal cytology
- Nasal culture (but it could be contaminated with normal flora if we took it by swap >> so using endoscope to take the sample is more accurate)
- Tests for immunodeficiency
- Tests for cystic fibrosis → sweat chloride test

Treatment

- The primary goals of management of acute sinusitis are:
- Eradicate the infection
- Decrease the severity and duration of symptoms
- Prevent complications

We differentiate between viral and bacterial sinusitis because in viral we use symptoms treatment we don't need to start with antibiotic ..unless we have severe symptoms such as high fever (39) ..here we can start with antibiotic

In viral we can start with analgesics

- ☐ Symptomatic or adjunctive therapies may include the following:
- Humidification/vaporizer
- Warm compresses
- Adequate hydration
- Smoking cessation
- Balanced nutrition
- Nonnarcotic analgesia
- Antihistamines are not recommended and have not been proven beneficial(unless we have allergy).

- **Topical decongestants such as oxymetazoline can be used to decrease mucosal edema.(<5days).... More than 5 days we may get rhinitis and increase in secretion**
- **A 15- to 21-day (3week) course of intranasal corticosteroids may reduce symptom duration when compared to placebo**

Antimicrobial treatment

- **Antibiotics are indicated for sinusitis that is thought to be bacterial, including sinusitis that is severe or involves the frontal, ethmoid, or sphenoid sinuses, since this type of sinusitis is more prone to complications.**

A 10- to 14-day regimen of amoxicillin 500 mg 3 times a day is recommended by many as first-line therapy

Why we don't use antibiotic from the beginning ?

Because it has side effects

To avoid resistant

- **If the patient worsens or fails to improve with the initial management option by 7 days after diagnosis, the clinician should reassess the patient to confirm ABRS, exclude other causes of illness, and detect complications.**
- **If ABRS is confirmed in the patient initially managed with observation, the clinician should begin antibiotic therapy.**
- **If the patient was initially managed with an antibiotic, the clinician should change the antibiotic.**

(ya3ni etha el pt ma t7san b3d 7 ayam we7na ma konna ma36eno antibiotic ..sa3etha bn36eh ...w etha konna ma36eno antibiotic (3 asas eno bacterial infiction) bn36eh dwa tani ..ya3ni another course of antibiotic)

The antibiotics that we use are :

- **Augmentin 500 mg po q 8 h (amoxicillin + clavulanic acid)**
- **Trimethoprim / Sulfamethoxazole DS one po bid**

- **Azithromycin** 500 mg po then 250 mg po q d x4
- **Pediazole** (Erythromycin - sulfisoxazole) QID may be best choice in kids

Antibiotic Therapy in Acute Sinusitis if Staph. aureus is suspected :

- **Also useful if patient fails Rx with previous antibiotics**
- **Cefuroxime** axetil 500 mg po q 12h
- **Cefprozil** 500 mg po q 12h
- **Cefpodoxime** 200 mg po 12h
- **Loracarbef** 400 mg po q 12h

Frontal sinusitis

We afraid from complication esp that the frontal table is attached to dura (so intercranial complication and meningitis)

- **Usually should be admitted for initial IV antibiotic Rx**
- **Higher incidence of intracranial complications**
- **Give IV Cefuroxime 2 gm IV q 8h or Ceftriaxone 2 gm IV q d and decongestants**

If not resolving in 24 to 48 hours of Rx may need surgical intervention (frontal sinus trephination or external sinusectomy

Surgery

- **Indications:**
 - **Recurrent or persistent sinusitis**
 - **Presence of complications may require surgical therapy.**

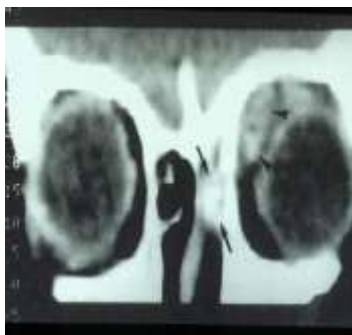
- Failure to respond to appropriate antibiotic therapy, especially in chronic and persistent sinusitis (eg, cystic fibrosis).

Functional endoscopic sinus surgery (FESS) has revolutionized the treatment of sinusitis in recent years (they enter with endoscope .. → reaching the ostium → widening the ostium → cleaning the sinus)

Complication that results from treatment failure :

- Mucocele or mucopyocele esp in frontal sinus
- Osteomyelitis (we detect swelling)
- Facial cellulitis
- Oroantral fistula esp in maxillary sinus
- Orbital cellulitis
- Cavernous sinus thrombosis (it may cause diplopia , ophthalmoplegia ,retro orbital pain ,decrease in level of consciousness then mortality may occur)
- Septic thrombophlebitis
- Meningitis
- Epidural , subdural and intracerebral **abscess**.

In this CT we can see epidural abscess from frontal sinusitis



Ethmoidal sinusitis and we have abscess (subperiosteal) which pushes the orbit laterally



General management of complications

- Hospitalization
- CT scan of sinuses (+/- cranial CT)
- IV antibiotics with anaerobic coverage
- ENT consult

Antibiotics to be considered in complications :

- Ceftriaxone 1 gm IV q 12h
- Cefotaxime 2 gm IV q 4h
- Ceftizoxime 4 gm IV q 8h + metronidazole 30 mg/Kg/d
- Ampicillin / sulbactam 3 gm IV q 6h
- Vancomycin 500 mg q 6h + aztreonam 1 gm q 8h or chloramphenicol (for PCN - allergic patients)

When to refer to otolaryngologist ?

- When continued deterioration occurs with appropriate antibiotic therapy
- When episodes of sinusitis recur
- When symptoms persist after 2 courses of antibiotic therapy
- When comorbid immunodeficiency, nosocomial infection, or complications of sinusitis are present

Management Summary:

- Diagnosis by clinical presentation
- Evaluate for complications
- Admit to hospital if complications present
- Treat for 10 to 14 days
- Extend Rx if not resolved in 10 days

- Workup and consult if not resolved in 3 weeks
- Prognosis
- Sinusitis does not cause any significant mortality by itself. However, complicated sinusitis may lead to morbidity and, in rare cases, mortality.
- Approximately 40% of acute sinusitis cases resolve spontaneously without antibiotics.
- The spontaneous cure for viral sinusitis is 98%.
- Patients with acute sinusitis, when treated with appropriate antibiotics, usually show prompt improvement. The relapse rate after successful treatment is less than 5%.

😊 **BEST WISHES** 😊

DONE BY :

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