

Lecture – 01

Upper Respiratory Tract Infection



Microbiology Team - 430

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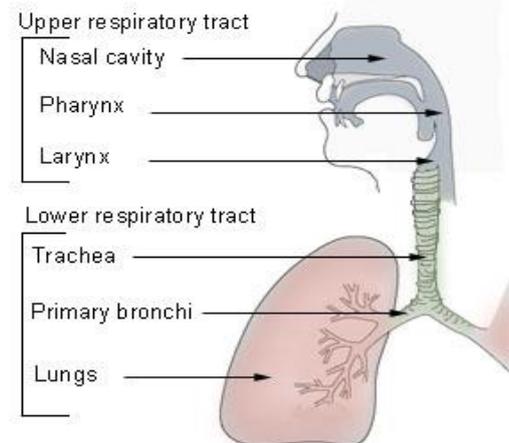
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### ▪ Upper Respiratory Tract:

1. Nose
2. Nasal Cavity
3. Paranasal Sinuses
4. Pharynx
5. Larynx

### Conducting Passages



### ▪ Upper Respiratory Tract Infections:

Syndromes	Diseases
<i>Pharyngitis "tonsillitis"</i>	<i>Diphtheria</i>
<i>Sinusitis</i>	<i>Pertussis "whooping cough"</i>
<i>Epiglottitis</i>	
<i>Otitis media</i>	
<i>Deep pharyngeal abscess (dr.somily said he won't ask about it)</i>	

## *Pharyngitis :*

Infection of the pharynx and tonsils

Etiology in most cases is **viral infection** (Enterovirus, Herpes, EBV, HIV)

### ▪ **Clinical Presentation:**

- In children (5 to 15 yrs) during late fall, winter and early spring.
- Sore throat
- Fever
- Tender and enlarged lymph nodes
- Tonsillopharyngeal exudates/edema and erythema
- **No cold symptoms (rhinorrhea and cough) in bacterial infection**  
“present in viral infection”

### ▪ **Organisms:**

**Bacterial Group A streptococcus**, Neisseria, Anaerobic bacteria, Corynebacterium diphtheria

### ▪ **Diagnosis:**

Throat swap (blood agar media)

### ▪ **Treatment:**

- Penicillin.
- Erythromycin “with penicillin allergic patients” .

## *Diphtheria :*

Occurs in immune compromised and unvaccinated patients in poor countries

It is a preventable disease (could be prevented by vaccine)

Fatal in children (1-5 years)

The organism *C.diphtheriae* adheres to the mucosal cells in throat and release toxins .

### ▪ **Clinical Presentation:**

- Sore throat.
- Difficulty in breathing and swallowing.
- Gray thick pseudomembrane (edema and necrotic cells) developed from the release of toxins.
- The pseudomembrane close “blocks” the throat and cause suffocation.
- The toxins might reach the blood stream and effect the CNS , heart “heart block” and kidneys.

### ▪ **Organism:**

*Corynebacteriumdiphtheriae*

### ▪ **Diagnosis:**

Throat swap (tinsdale media)

### ▪ **Treatment:**

Erythromycin

## ***Epiglottitis :***

Acute inflammation in the supraglottic region of the oropharynx with inflammation of the epiglottis

Occurs in unimmunized children.

### ▪ **Clinical Presentation:**

- Fever
- Difficulty breathing
- Drooling (inability to handle secretion of saliva)
- Dysphasia (impairment of speech)
- Stridor (harsh vibrating noise when breathing, caused by obstruction of airways)

### ▪ **Organism:**

***H.influenzae Type b***, *S.pneumoniae*, *S.aureus* (Beta hemolytic streptococcus), *Candida*

### ▪ **Diagnosis:**

- X-ray (lateral x-ray shows thumb side epiglottis)
- No swabs because death may occur if patient opens his mouth

### ▪ **Treatment:**

Ceftriaxone

## *Pertussis :*

Respiratory tract infection characterized by a paroxysmal cough

*Bordetella pertussis* release toxins that effect trachea and bronchi and mediated by lymphocyte predominance.

### ▪ **Clinical Presentation:**

- Incubation period (1-3 weeks): asymptomatic period
- Catarrhal Stage (1-2 weeks): fever, mild cough
- Paroxysmal Stage (1-6 weeks): **paroxysmal cough** (short frequent sudden attacks of cough)
- Convalescent Stage (3-6 weeks): chronic cough

### ▪ **Organism:**

***Bordetella pertussis (GNB)***

### ▪ **Diagnosis:**

Nasopharyngeal swap (Regan-Lowe and Bordet-Gengou media)

**This media contains Charcoal and blood**

### ▪ **Treatment:**

Erythromycin

## *Acute Otitis Media :*

Infection of the middle ear, causes secretions “edema” that obstruct the Eustachian tubes

### ▪ **Clinical Presentation:**

- Ear pain “infants pull their ears”
- Red tympanic membrane
- Fever
- Mastoiditis (infection of the spaces within the mastoid bone) treatment for 2 weeks

### ▪ **Organism:**

**S. pneumonia, H. influenza**, Group A Streptococci. S. aureus, Moraxella catarrhalis, fungal.

### ▪ **Diagnosis:**

By the Otoscope (An instrument for examining the interior of the ear)

### ▪ **Treatment:**

Amoxicillin

In severe cases Tympanocentesis (puncturing the tympanic membrane to drain fluids from middle ear) is required.

## ***Bacterial Sinusitis :***

Inflammation of the lining of the paranasal sinuses

	<u>Acute Sinusitis</u>	<u>Chronic Sinusitis</u>
<b>Clinical Presentation:</b>	More local symptoms More in children	unresolved acute sinusitis with less local symptoms Mimic allergic rhinitis
<b>Organism:</b>	S.pneumoniae, H.influenza M.catarrhalis	same as acute + <b>oral anaerobes</b>
<b>Diagnosis:</b>	Clinical diagnosis <u>No need for X-rays CT/MRI</u> <u>Aspiration only in case of</u> <u>immune compromised</u> <u>patients or TTT (treatment)</u> <u>failure.</u>	X-rays CT/MRI is less useful (Obtain odontogenic X-rays if maxillary sinus) <u>(in sever we need to take biopsy form</u> <u>the sinus)</u>
<b>Treatment:</b>	Quinolones or Ceftriaxone for 1-2 weeks	Quinolones or Ceftriaxone for 2-4 weeks

- If CT showed Periorbital cellulitis roll out sinusitis
- Post-septal involvement treat as meningitis

Syndromes/diseases	organism	Clinical features	diagnosis	Treatment
<b>Pharyngitis</b>	Group A streptococcus	Sore throat Fever Tender and enlarged lymph nodes	Throat swap (blood media)	Penicillin
<b>Sinusitis</b>	S.pneumoniae H.influenza M.catarrhalis oral anaerobes in chronic	More local symptoms in acute  Less local symptoms in chronic	X-rays CT/MRI	Quinolones or Ceftriaxone
<b>Otitis media</b>	S. pneumonia H. influenza	Ear pain Red tympanic membrane Fever	Otoscope	Amoxicillin
<b>Epiglottitis</b>	<i>H.influenzae</i> Type b <i>S.pneumoniae</i>	Fever Difficulty breathing Drooling Dysphasia	X-ray	Ceftriaxone
<b>Diphtheria</b>	<i>Corynebacterium diphtheriae</i>	Sore throat Difficulty in breathing and swallowing  Gray thick pseudomembrane	Throat swap (tinsdale media)	Erythromycin
<b>Pertussis</b>	<i>Bordetella pertussis (GNB)</i>	paroxysmal cough	Nasopharyngeal swap (Charcoal and blood media)	Erythromycin