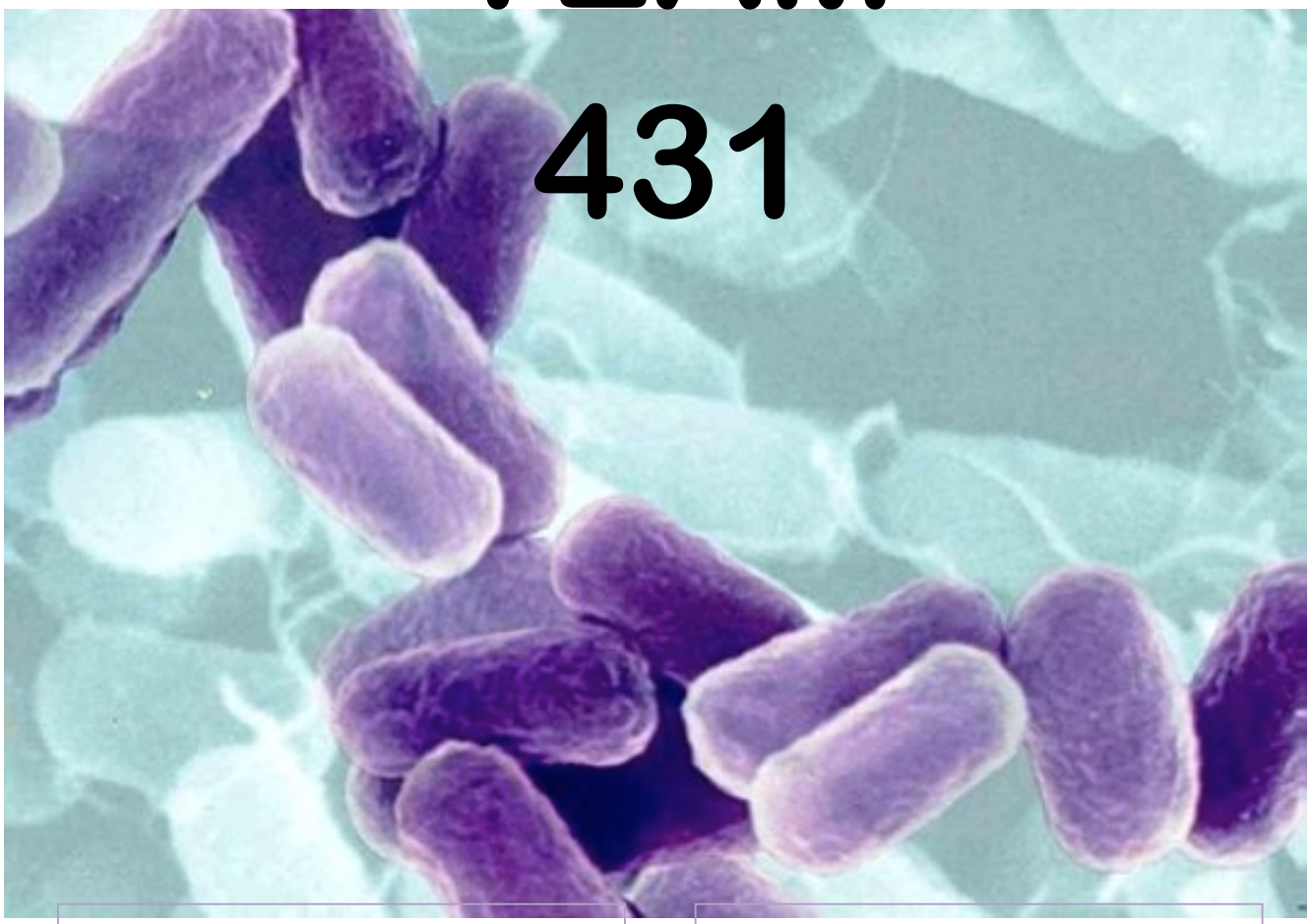
MICROBIOLOGY TEAM 431



TEAM MEMBERS:

Dalal Fatani

Jazeel AlMulla

Jumana AlShammari

Lama Mokhlis

Maymonah alabdely

Samiha AlJetaily

Abeer AlSwailem

Nourah AlSwaidan

Haifa Alabdulkarim

Bayan Al Tassan

TEAM MEMBERS:

Faisal Al Rashed

Ghassan Al Kharboush

Yazeed Al Qasim

Abdullah Al Turki

Abdullah Baqais

Abdullah Al Sulaimani

Abdullah Al Sufiani

Abdurrahman Al Sehli

Upper Respiratory Tract Infections

1. The RED color for the important points
2. The Blue color for the points which the doctor explained but didn't write in the slides.
3. Green is extra information

Generally, the most important Normal Flora that can cause upper respiratory tract infection are:

1- Streptococcus Pneumoniae. 2- Haemophilus influenzae. 3- Moraxella Catarrhalis

Most common cause of [Otitis media / Sinusitis]: **Streptococcus Pneumoniae**

Most common **Bacterial** cause of Sore throat: **Group A streptococcus (Strep. Pyogens – β Hemolytic Streptococci)**

Pharyngitis

- It is the inflammation of the throat, mainly the oropharynx.
- It is common in late fall, winter, early spring.
- It is common affect children between 5 to 15 years because they have more Adenoid tissue.
- Clinical presentation **difficulty in swallowing**, **erythema** (redness), **edema** and **exudates**. Bacteria (**enlarged lymph nodes**, **fever**) Virus (runny nose and sneezing).

Etiology:

- **Viruses** are the most common; Entrovirus, HSV, EBV, HIV (early stages of HIV may represent with pharyngitis)
- **Group A streptococci** is the most common bacterial cause
- **Neisseria gonorrhoeae** (sexually transmitted).
- Anaerobic Bacteria also may cause Pharyngitis especially **Fusobacterium** which cause thrombosis in the internal jugular vein and this may lead to lung emboli "Lemierre's syndrome".
- Corynebacterium diphtheria (rare)

➢ EBV and Group A streptococci have almost the same clinical presentation.

Corynebacterium diphtheria

- Rare disease because of the vaccine.
- One of the most common causes of death in **unvaccinated children**.
- The Bacteria is club shaped. It is normal flora in some population but these normal floras do not have toxins. A virus "Bacteriophage" infects the bacteria. This virus inserts the toxin gene inside the bacteria.
- Clinical diagnosis the presence of **grey whitish membrane** scratching it would cause bleeding.
- Laboratory diagnoses with **Tinsdale media** to detect the toxin.
- It is the only disease that crosses the midline. The problem is it is not a local disease. The toxin may cause Nephrotoxicity, Cardiotoxicity and Neurotoxicity.
- Treatment: first line is antitoxin then **Penicillin** or **erythromycin**.

➢ Note: the key word of the question in the **exam** is "**unvaccinated**".

Epiglottitis

- Epiglottitis is a pediatric emergency
- Usually affect unimmunized children they present with presented with dysphasia, drooling, distress, high fever, and difficulties in swallowing.

  ETIOLOGY:
  - The most common cause is **Haemophilus influenzae type B**.
  - Other etiology **Streptococcus Pneumoniae**, **Haemophilus influenzae nontypable, Candida**, **Staphylococcus aureus**, or **β Hemolytic Streptococci**.
- Treatment with **ceftriaxone** (cephalosporin 3rd generation**)**.
- When the epiglottis is inflated, it looks like **Thumb** in the X-ray.
- You **should not examine the patient by swab**.
- To examine the patient, it is necessary to use muscle relaxant and use intubation under ENT surgeon supervision.

Pertussis (whooping cough)

There is a vaccine nowadays for pertussis but the problem is the amount of antibodies decreases with time and the patient may then get infected. That is why we may still see some cases especially in adolescents. The problem will be more complicated when those teenagers spread the infection to **non vaccinated children.** So it is necessary to revaccinate adolescents and to give prophylactic antibiotic to the people who are close than infected persons. Patients do not get the infection at once. Instead, they experience four phases:

1- Incubation period 1 to 3 weeks. Treatment work best in this stage
2- Catarrhal Stage 1-2 weeks.
3- **Paroxysmal Stage 1-6 weeks.** "Acute attacks" (dangerous stage the patient will have continuous cough which end with vomiting)
4- Convalescent Stage 3-6 weeks.

- Eitiology **Bordetella pertussis**.
- The bacterium produce a toxin which cause very small and thick mucus plug so the patient will try to cough to get it out by multiple coughing then he will try to catch his breath and this will make the sound of the "whooping cough".

The special thing about pertussis is the **toxins** produced by this organism which are:

- **Pertussis toxin (PT)** "which is the most serious one"
- **Filamentous hemagglutinin (FHA)**
- **Pertactin (PRN)**

Diagnosis:

- Clinical diagnosis then laboratory for conformation.
- In CBC of the patient there will be Leukocytosis **ymphocytosis** (which may be mistaken with leukemia)
- Nasopharyngeal (NP) swabs, Charcoal-horse blood T media, Regan-Lowe, and Bordet-Gengou

➢ Usually, in Bacterial infections we have Leukocytosis.

- Treatment with **erythromycin**.

Acute Otitis Media

Otitis media means inflammation of the middle ear.

Eitiology:

- Most of the cases are viral
- **Streptococcus Pneumoniae** and **Haemophilus influenza**
- Group A Streptococci, Moraxella Catarrhalis and Staphylococcus aureus.
- Fungal

As we know, the tympanic membrane "eardrum" separates the external ear from the inner ear. In a case of viral infection this may lead the Bacteria to be sucked in the Eustachian tube, multiply and cause inflammation of the tympanic membrane. In some conditions, if this infection is not treated it may spread to the mastoid bone causing osteomyelitis "**Mastoiditis**" as a complication.

Diagnoses:

- Clinical diagnosis.
- In some cases, e.g. multi drug resistant organisms we may use **Tympanocentesis** which the ENT surgeon will use a small-gauge needle to puncture the membrane to drain the pus for **diagnosis and management**.

Treatment:

- Penicillin "**Amoxicillin**"
- If the patient is not responding or allergic we can use 2nd generation cephalosporin or erythromycin.

Bacterial Sinusitis

A patient with inflammation of the sinuses will present with **change in voice** "lose the resonance". This is because of the openings of those sinuses are closed and we will have collection of fluid in it.

Acute sinusitis:

- Affect children
- Eitiology: ***S.pneumoniae, M.catarrhalis****, and H.infuenza*
- Mainly **diagnosed clinically**
- Diagnosis by X-rays CT/MRI in severe cases
- In some cases, the inflammation may extend from the maxillary sinus to the orbit of the eye so they may get **periorbital cellulitis** which is a very serious case.
- Treatment: Quinolones or Ceftriaxone For 1-2 weeks

Chronic sinusitis:

- less local symptoms
- **mimics allergic rhinitis**.
- Eitiology: ***S.pneumoniae, M.catarrhalis****, H.infuenza* , **oral anaerobes**, also rhizopus fungi.
- X-Ray and CT scan can be used to roll out tumor.
- ENT surgeon may need to take a sample by needle.
- Obtain odontogenic X-rays if maxillary sinus
- Treatment: Quinolones or Ceftriaxone For 2-4 weeks

Deep Neck Space Infections

The neck has some empty spaces; peripharyngeal, **retropharyngeal,** lateral pharyngeal, prevertebral space. If an infection occurred in the throat or sinuses, these spaces may be filled by pus. They also can go from one triangle to another. It may compress the carotid artery, cause thrombosis to the jugular vein. It also can go to the esophagus then to the trachea. It may also go to the retromedistinum and cause pericarditis. Any infection of the upper respiratory or oral cavity, like **Lemierre's syndrome**, which we already discussed, they may spread in these spaces and cause very bad infections.

- Patients are toxic with unilateral posterior pharyngeal soft tissue mass on oral exam
- Neck stiffness with retropharyngeal space infection/abscess
- Retropharyngeal (danger space) infection may extend to mediastinum and present as **mediastinitis**
- Prognosis is poor without **surgical drainage**
- The usual pathogens are Oral streptococci and anaerobes.
- We treat them with Merpenem, Pipracilli or Clindamycin.
- Duration: 2 weeks

➢ Clindamycin is a very excellent drug it is anti-strep & anti-staph & anti-anaerobe (used in RTI, SSTI, & bone) has a very good absorption and invasion of bone.