

سههههههه + آءر صفة هه اءاءة للمءءوب بس شوفوه برضو مش ءلط




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Bacterial infections of the Respiratory Tract 3

Corynebacterium diphtheriae

- ✓ General information :
 - G-positive rod/ bacill / club shaped
 - Non-spore forming, non-motile , **not capsulated and non invasive**
 - cause cutaneous and respiratory infections
 - not virulent , except when it is infected with bacteriophage **[gain the toxgene by lysogenic repression]**

- ✓ Morphology : Chinese letters(V+L) + Palades: parallel to each other+ The granules stain metachromatically (stain the granules red)

Transmission	Pathogenesis	Clinical Findings	Diagnosis	Treatment	Prevention
<p>- Humans are the only natural host of C. diphtheriae</p> <p>- airborne or droplets</p>	<p>- The production of toxins is the cause of the disease.</p> <p>- No invasion into the blood [the systemic signs and symptoms are related to the toxin.] -This Toxin inhibits protein synthesis by ADP-ribosylation [of elongation factor-2]- primary mechanism : no protein synthesis in eukaryotic cell.</p>	<p>- forming a thick pseudomembrane in the pharynx[consists of fibrin, WBCs, RBCs, bacteria and exudates]</p> <p>- removing off this membrane can cause bleeding</p> <p>COMPLICATION:</p> <p>- Extension of the membrane into the larynx and trachea→ causing airway obstruction.</p> <p>- Myocarditis</p> <p>- Nerve weakness or paralysis.</p> <p>-mild or asymptomatic in adults</p>	<p>- mainly by clinical suspicion[pseudomembrane] and the treatment is by giving anti-toxin immediately without waiting for laboratory results.</p> <p>- two selective media : Loeffler's medium (cream colored colonies) + tellurite plate (black colonies). - Smears: should be stained with Gram stain+ methylene blue.</p> <p>- The gold standard for the detection of diphtheria toxin : Elek test</p>	<p>- antitoxin</p> <p>- penicillin G</p> <p>- erythromycin</p>	<p>The vaccine (DTaP): Consist of inactivated diphtheria toxin+ tetanus toxoid+ inactivated pertussis toxin.</p> <p>- three doses.</p> <p>- Immunization does not prevent nasopharyngeal carriage of the organism.</p>
			 <p style="text-align: center;">Grayish white membrane</p>		

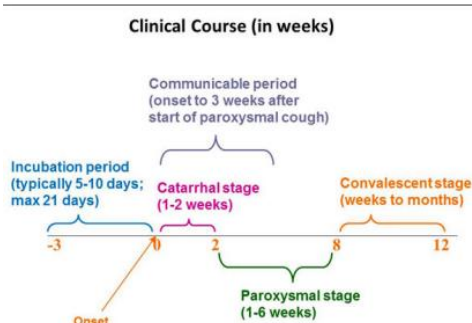
Bordetella pertussis

✓ General information :

- Gram-negative rod , encapsulated
- the cause of whooping cough (pertussis)
- non-invasive: needs a factor that will help to attach and colonize the pharynx

Pathogenesis	Clinical Findings	Diagnosis	Treatment	Prevention
<p>- Filamentous hemagglutinin: protein uses to attach itself to the cilia of the epithelial cells → no mucus clearance.</p> <p>- Pertussis toxin: stimulates (by enzymatic ADP ribosylation of G-proteins) the intracellular cAMP → over production of mucus./ it increases extracellular secretions.+increase cAMP[similar to the diarrhea mechanism by cholera]</p> <p>- adenylate cyclase: evaded immune cell destruction.</p> <p>- Tracheal cytotoxin a fragment of the bacterial peptidoglycan , acts alongside with endotoxin to induce nitric oxide, which kills the ciliated epithelial cells.</p>	<p>blood cultures are negative, but with pronounced leukocytosis with up to 70% lymphocytes. [due to Pertussis toxin , an A/B structured toxins]</p> <p>In children :</p> <ul style="list-style-type: none"> - Whooping cough - paroxysmal pattern - death is mainly due to pneumonia. <p>In adult :</p> <ul style="list-style-type: none"> - larger airways: not really develop the whooping cough - paroxysmal cough 	<p>- nasopharyngeal swabs taken during the paroxysmal (cough) stage</p> <p>- Polymerase chain reaction</p>	<p>- Azithromycin - erythromycin - Supportive care: oxygen therapy</p>	<p>- Vaccine based: killed vaccine containing inactivated B. pertussis organisms or acellular vaccine[contains 5 purified antigen proteins]</p>

- ➔ (pertussis toxoid) the toxoid in the vaccine is pertussis toxin that has been inactivated genetically by introducing two amino acid changes, which eliminates its ADPribosylating activity but retains its antigenicity.
- ➔ pertussis toxin is the main factor in the vaccine concerning B. pertussis



Corynebacterium diphtheriae

*causes Diphtheria

Bordetella pertussis

*causes pertussis (whooping cough)

<i>Corynebacterium diphtheriae</i>	<i>Bordetella pertussis</i>
<ul style="list-style-type: none"> - G-positive rod, not capsulated - not virulent, unless (bacteriophage > phage > bacteria > toxigenic) - club shaped - granules stain metachromatically - Non-spore forming, non-motile - humans are the only natural host and reservoir. - transmitted by airborne droplets. - not invasive. Systemic effects are produced by toxins. - pseudomembrane formation > which leads to airway obstruction. - cardiac and neural complications - diagnosis is based on clinical suspicion, laboratory findings for confirmation - culture in tellurite plate > black dots - Elek test: for toxin detection - toxin > antitoxin Bacteria > erythromycin and penicillin G - DTaP containing diphtheria toxoid 	<ul style="list-style-type: none"> - G-negative rod, encapsulated - 5 virulence factors (filamentous hemagglutinin, pertussis toxin...) - not invasive - the cause of whooping cough - increases mucus production - lymphocytosis - mainly children - 4 stages - adults form is called: chronic 100-day cough - death is mainly due to pneumonia - patients diagnosed with whooping cough > antibiotics - culture lasts for 1 week - Bordet-Gengou medium - azithromycin (macrolide) and erythromycin - acellular vaccine (proteins only). The main immunogen in acellular vaccine is the inactivated pertussis toxin
Things in common	
<p>Both are rod-shaped, the major virulence factor is the toxin produced which is the main cause of systemic signs and symptoms, non-invasive bacteria, same mode of transmission which is air-borne droplets and both are present in the DTaP vaccine. This vaccine is given in doses and there is a booster dose every 10 years because the vaccine does not give a life long immunity</p>	