

Lecture 2

By Omar Debas

	<i>Hemophilus influenzae</i>	<i>Bordetella pertussis</i>	<i>Pseudomonas aeruginosa</i>
General info	Gram-ve coccobacilli Non-motile, no spores some are capsulated.	Gram-ve aerobic coccobacilli	Gram-ve bacilli motile with single or multiple-poled flagella
Virulence factors / Pathogenesis	<p>A polysaccharide capsule classifies the pathogen from A to F. B is the most pathogenic with a polyribitol phosphate capsule (PRP).</p> <p>The outer membrane reduces mucociliary clearance.</p> <p>IgA protease activity.</p>	<p>Filamentous hemagglutinin causes attachment to the cilia</p> <p>The pertussis toxin (ptx) has adenyl cyclase activity and suppresses phagocytosis.</p> <p>The tracheal cytotoxin (tct) causes necrosis of the ciliated cell.</p>	<p>Pili has a glycocalyx which forms a biofilm to protect it antibiotics and the immune system</p> <p>cytotoxin A inhibits protein synthesis & causes tissue necrosis. Pyocyanin damages the cilia and kills the cell.</p>
Clinical Presentation	<p>The capsulated H. influenzae causes epiglottitis (cherry red appearance) and can cause bacteremia, meningitis or septic arthritis.</p> <p>Non-capsulated influenza cause otitis media, sinusitis tracheobronchitis and pneumonia</p>	<p>catarrhal stage (1-2 weeks): fever, sneezing, rhinorrhea.</p> <p>Paroxysmal stage (2-4 weeks): Repetitive coughing with the distinct "whoop" on inhalation. Patient's get cyanosed and convulsions</p> <p>Convalescent stage (weeks) Gradual recovery with immunity</p>	<p>P. aeruginosa is found in water (Jaccuzi, swimming pools) and is an opportunistic pathogen, prevalent in people with skin burns, chronic respiratory disease (such as CF) and immunocompromised ppl</p> <p>Hospital-acquired pneumonia (ventilator acquired pneumonia), otitis externa, eye infections folliculitis, nails, meningitis</p>
Laboratory Diagnosis	<p>Chocolate agar, or agar enriched with factors X and V or satellitism with S. aureus</p> <p>Quellung reaction - capsule swells</p>	<p>Nasopharyngeal swab or coughing on the plate (Bordet-Gengon medium) or (charcoal-cephalexin agar)</p> <p>shiny convex "mercury drop"</p> <p>Colonies show hemolysis</p>	<p>P. aeruginosa has a distinct grape odor. It is oxidase +ve and is a non-fermenter</p> <p>Pigments: Pyocyanin = blue-green Pyoverdin = Green-yellow (fluorescent) Pyorubin = Red</p>
Management	<p>Tracheostomy or intubation in case of epiglottitis.</p> <p>Rifampicin for prophylaxis</p>	<p>AB' are not useful during the paroxysmal stage because the damage has been done.</p> <p>whole cell vaccines cause encephalopathy. Acellular vaccine has fewer side effects given at 2, 4 and 6 months, 15-18 months and 4-6 years.</p>	

