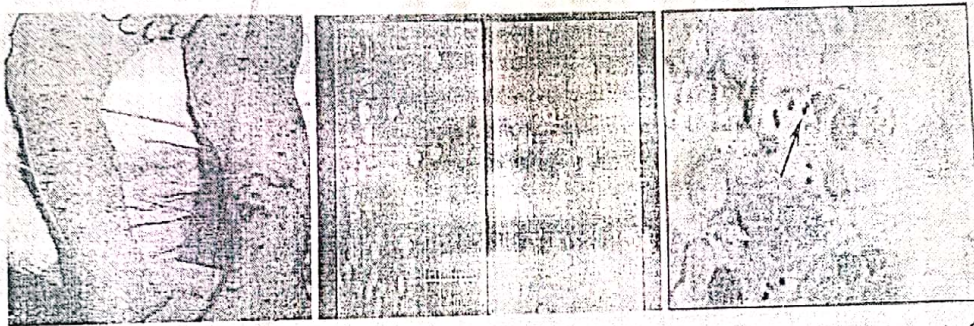


Ahmed Mustafa
F17-011

Neisseria meningitidis

A 8-year-old child is brought to the emergency department by his parents. He has been irritable and not eating well for the past 12 hours. He now has a temperature of 103°F, neck stiffness and has a petechial rash on his legs. The physician collects blood and CSF samples for analysis. When Gram stained, the CSF sample appears as shown. Both CSF and blood samples were plated on chocolate agar, resulting in white, mucoid colonies. Cells from the colony growth were Gram negative and oxidase positive. What is the most likely etiology and infection?

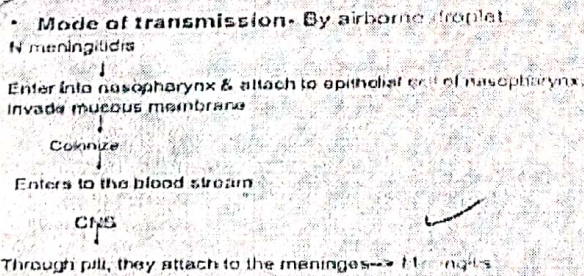


1. Name the disease and the causative agent. *Neisseria Meningitidis*
 2. What is the morphology of the bacterium on Gram stain? → Gram -ve cocci
 3. What virulence factor is variable between strains and allows the microorganism to evade phagocytosis and survive desiccation? *Polysaccharide caps*, *IgA protease*, *Protein A binding*, *Endotoxin*, *Pili*
 4. Enumerate the virulence factors. *Capsular*, *Meningococemia*
 5. What is Waterhouse-Friedrichson syndrome? *severe form of meningococemia*, *fever*, *thrombocytopenia*, *adrenal insufficiency*, *shock*
 6. Name the culture media and the biochemical tests. *Trayer martin media*, *Chocattet agar*
 7. What is the treatment & Prevention of disease?
 8. Enlist the causes of meningitis in a full age group. *St pneumonia*, *H. influenza*, *N. mening*
 9. Name the site where this organism is present as flora. *normal flora of nasopharynx*
 10. What is the route of transmission & pathogenesis? *E. coli*, *Strep A.*
- (2) Gram -ve intracellular diplococci show with in the neutrophils.
- (3) Polysaccharide Capsule.

KEY:

1. The patient most likely has meningitis caused by *Neisseria meningitidis*.
2. Gram-negative intracellular diplococci shown within Neutrophils.
3. The polysaccharide capsule is virulence factor that is variable between strains and allows the microorganism to both evade phagocytosis and survive desiccation.
4. Capsular polysaccharide, Outer membrane proteins, Pili, IgA protease, Lipopolysaccharide or endotoxin.
5. Waterhouse-Friderichson syndrome: Most severe form of meningococemia. Life-threatening: High fever, shock, widespread purpura, disseminated. Intravascular coagulation, thrombocytopenia, Adrenal insufficiency.
6. Culture: Chocolate agar: incubated at 37°C in 5% CO₂. Modified thayer martin medium: Colonies are convex, mucoid, transparent, and glistening. Biochemical tests: Glucose & maltose fermenter, Oxidase positive, Dnase negative
7. Penicillin G, Chloramphenicol, Cephalexin, Cefotaxime, Ceftriaxone
Conjugated Vaccine: four polysaccharides with a carrier protein, diphtheria toxoid. Conjugated in children (11-12) which prevents meningitis in teens and young adults.
Unconjugated Vaccine: four polysaccharides without a carrier protein.
Unconjugated vaccine recommended in military personnel and travellers.
8. *Streptococcus pneumoniae*, *N. meningitidis*, *H. influenzae*
9. Normal flora of nasopharynx.
- 10.

Pathogenesis of *N. meningitidis*



Lipopolysaccharides
Outer membrane

Ceftriaxone

10.

Pathogenesis of N meningitidis

• Mode of transmission- By airborne droplet

N meningitidis

Enter into nasopharynx & attach to epithelial cell of nasopharynx.
invade mucous membrane

Colonize

Enters to the blood stream

CNS

Through pili, they attach to the meninges → Meningitis

Leptop
Oule

Ceftri