Microbiology

Subject :

Lec no : 11

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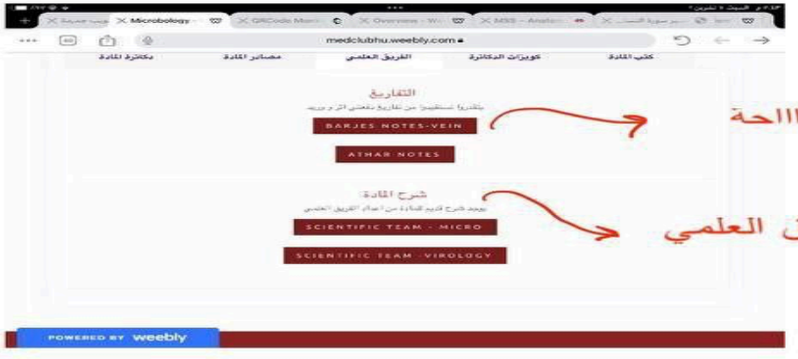
وقل رب زدني علما

للوصول الى guidance المايكرو و تفاريغ المادة كاملة :

كل اعمال الفريق العلمي تنشر على قناة التيليغرام

تجدون في guidance مادة المايكرو على موقع النادي :



فاريغ برجس جداااا قوية ، سفاااااحة

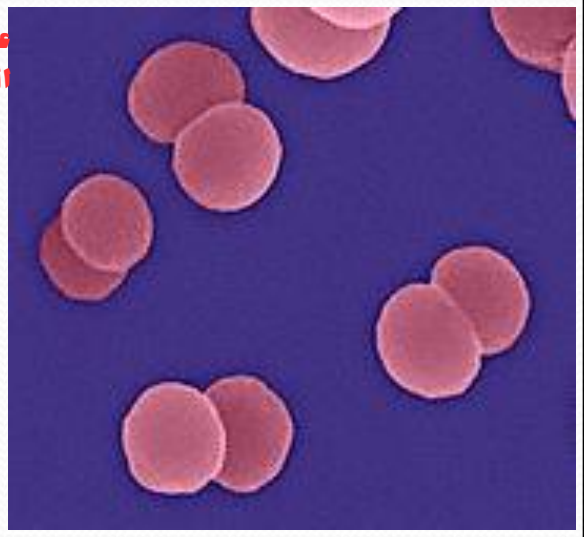
شرح للفريق العلمي

بتلاقو هون ملف سكشني ، بدل ما تحضروا الفيديوهات بتلاقوها هون كتابة

Neisseria meningitidis (meningococcus)

General Characteristics

- Encapsulated small, gram-negative diplococci
- Oxidase positive
- Catalase positive
- Can be a member of the normal flora of the upper respiratory tract
- Causes life-threatening disease when the bacteria invade the blood or cerebrospinal fluid
- CO_2 enhances growth but is not absolutely required
- Less sensitive than *Niesseria gonorrhoeae*
- Have a well developed highly antigenic capsule



Structure

- Pili: attachment and enhance virulence
- Outer membrane:

1. Porins
2. Outer membrane proteins (OMP)
3. Lipooligosaccharide (LOS)

- Capsule contains polysaccharide with more than 13 known antigenic types
- Types A, B, C, Y & W135 are more commonly associated with human disease

Epidemiology

Nasopharynx normal flora في ١٠٪ من الناس عندها هاي البكتيريا

- *Neisseria meningitidis* found as nasopharyngeal flora in 10% of healthy individuals
- Transmission occurs by inhalation of respiratory droplets through close contacts with infectious person (e.g., family members, day care centers, military barracks, prisons, and other institutional settings)

تنتقل من خلال الاتصال القريب

- The most common cause of meningitis in under 20 and the second most common cause after *pneumococci* in all ages

اذا نحكي عن ال common للاتهاب السحايا للناس الي عمهم اقل من عشرين فهي هاي البكتيريا اما اذا مان بغض النظر عن العمر فتكون الpneumonia

خط مفيد ← يعني نادر بين وقت الى اخر

- Usually cause sporadic cases but can be associated with outbreaks

يعني عندك طفل في مدرسة معو الاتهاب نقل العدوى الى زملاءه والحالات تسجل فقط من تلك المدرسة

↳ Rare

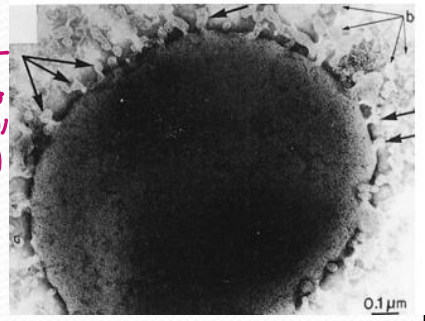
Virulence Factors الشراسة

- Pili-mediated, receptor-specific colonization of nonciliated cells of nasopharynx
- Antiphagocytic polysaccharide capsule allows systemic spread in absence of specific immunity
- Toxic effects mediated by hyperproduction of lipooligosaccharide (Endotoxin)

عوامل الشراسة مش كثير خطيرة بس
الخطير فيها مكان المرض الي هو الدماغ

Pathogenesis

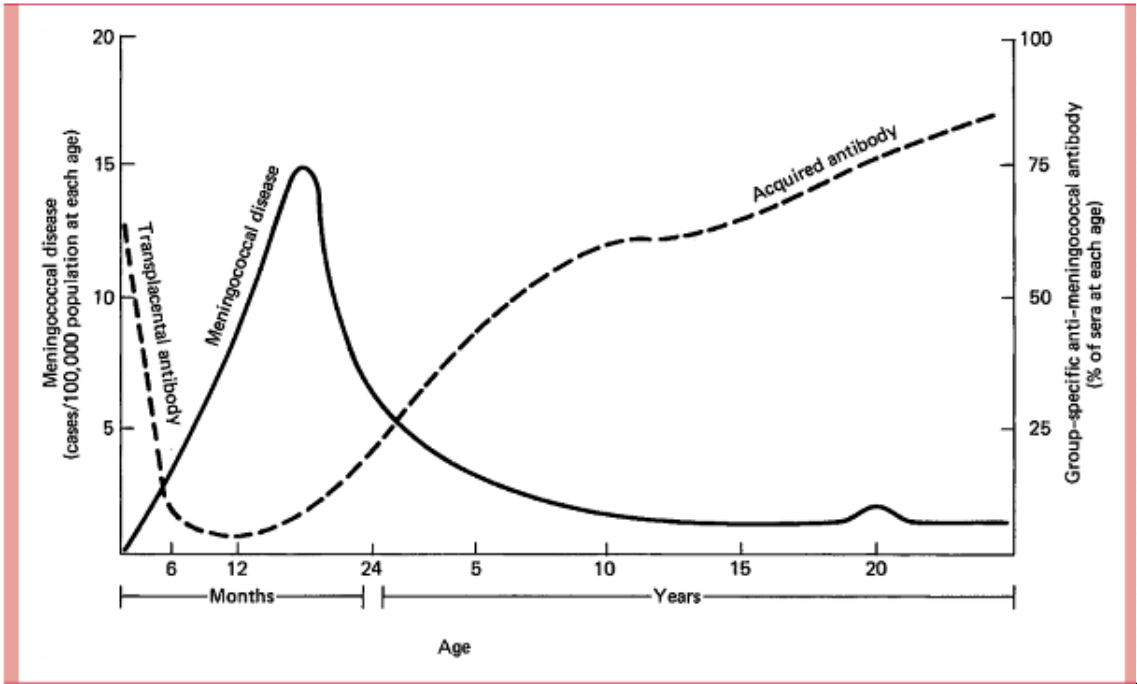
- Pili/fimbriae facilitate attachment to mucosal epithelium and invasion of submucosa
- Specific receptors for bacterial fimbriae on nonciliated columnar epithelial cells in nasopharynx of host
- Organisms are internalized into phagocytic vacuoles, avoid intracellular killing
- Replicate intracellularly and migrate to subepithelial space
- Once bacterial reach blood survival is mediated by production of polysaccharide capsule
- Endotoxin release and blebbing mediates systemic manifestation like shock
- Primarily infect CNS to cause acute purulent meningitis with meningocoocal bacteremia and systemic manifestation



Immunity

- Immunity to meningococcal infection is related to group specific antipolysaccharide antibody which is bactericidal and facilitate phagocytosis
- Infection, carrier state or other polysaccharide stimulate antibodies production
- Absence of antibody correlates with susceptibility

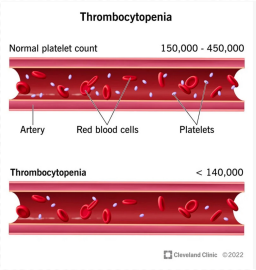
حساسية



Clinical Presentation

Meningitis:

- Fever, fatigue, weakness, Drowsiness
- CNS: convulsion, motor disability, loss of consciousness
- Thrombocytopenia results in bleeding and skin petchiae
- Disseminated intravascular coagulation (DIC)
- Fatal if not treated early (death within 6 hours of initial presentation)



اعراض اخرى بكون عند المريض Neck stiffness

Laboratory Diagnosis

Specimen collection and transportation

- Specimens: pharyngeal swab, cerebrospinal fluids, skin lesions and blood

نأخذ عينة من Cerebrospinal fluid من العامود الفقري من الفقرة L4 -L5

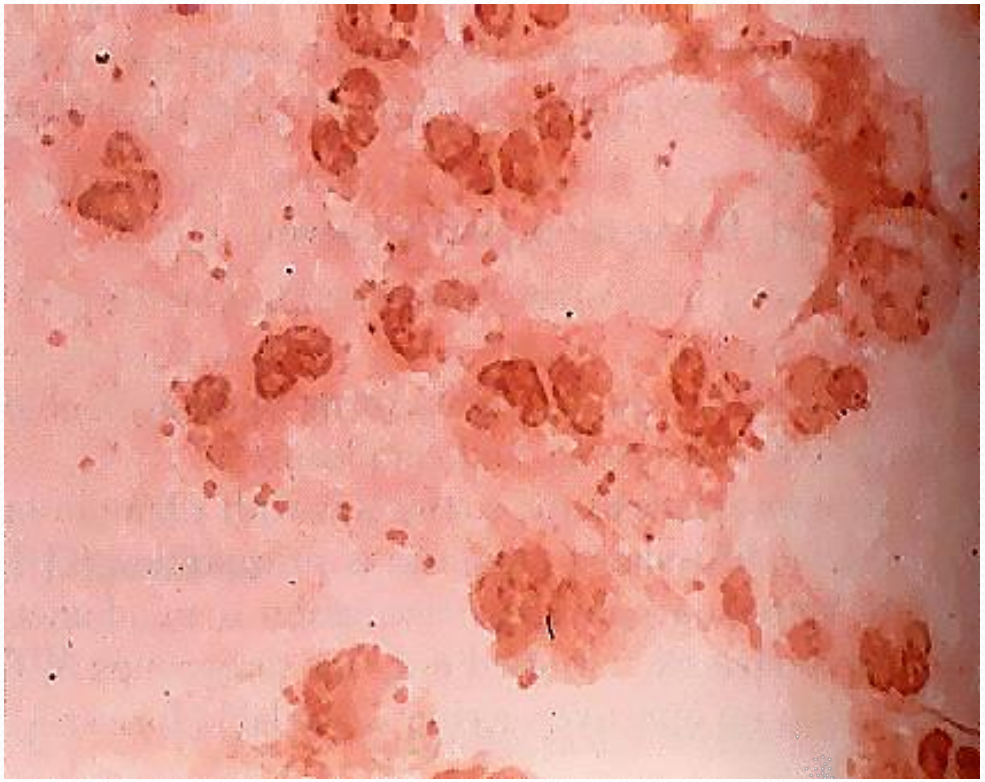
- Less sensitive compared to *Neiserria gonorrhoeae*, however quick handling is required to establish the diagnosis early

وجودها في الدم كإيجابي الأهمية

- Transport in media with increased CO_2 using special packaged system that contain CO_2 generation system

1. Gram Stain

- Large numbers of encapsulated, small, gram-negative diplococci (flattened along adjoining side) and polymorphonuclear leukocytes (PMN's) can be seen microscopically in cerebrospinal fluid (CSF)



2. Culture

Media:

- Thayer Marten Media (TM)
- Modified Thayer Marten Media (MTM
- Blood or Chocolate agar

Incubation conditions:

- Incubate at 35-37 °C for 18 hours
- CO_2 enriched ex candle jar (5-7%)
- Humid atmosphere ex sterile gauze pad soaked with sterile water in the bottom of candle jar

Colonial appearance:

- Medium, smooth, round, moist, gray to white, encapsulated strains are mucoid

3. Biochemical Tests

- Oxidase positive
- Glucose and maltose fermentation positive (while lactose fermentation is negative)
- Nitrite reduction negative

4. Immunological Tests

- The routine detection of *Neisseriae meningitidse* capsular polysaccharide antigen in body fluids (CSF) is not recommended

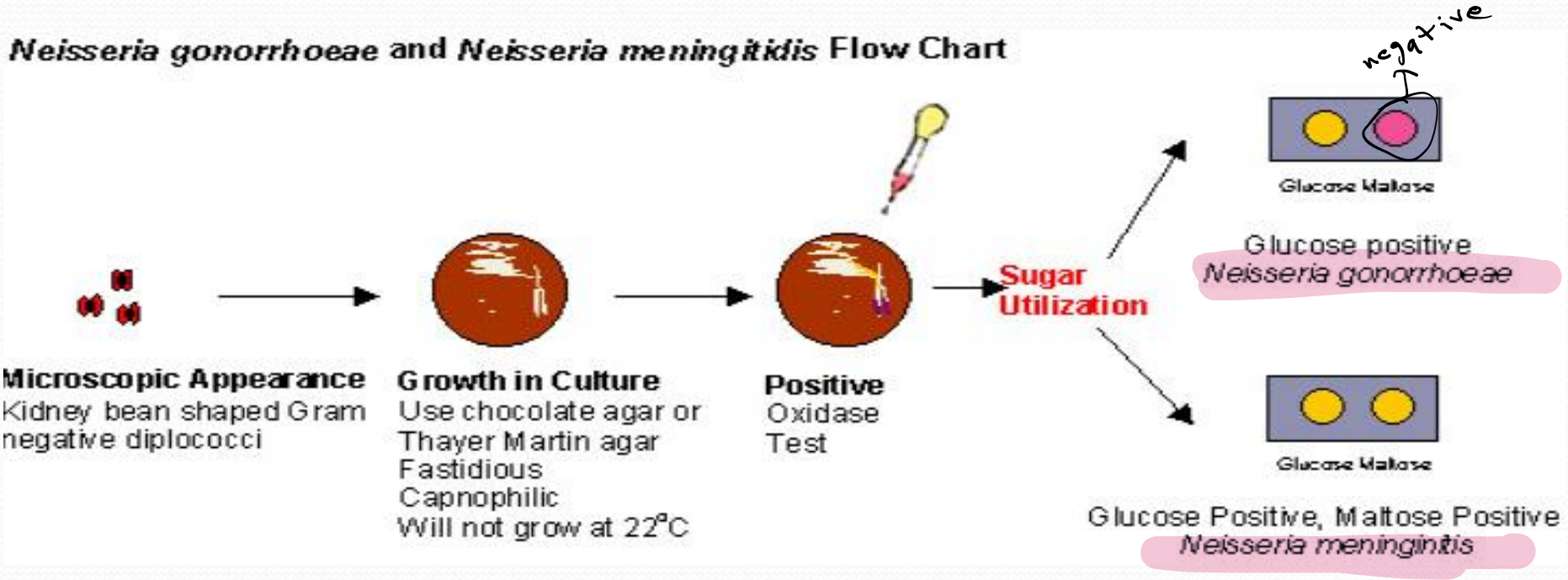
5. Antimicrobial Susceptibility Tests

- Resistance to pencillin is very rare and accordingly pencillin is still the drug of choice
- Chloramphenicol or cephalosporins can be used as alternatives
- Routine susceptibility testing is of limited value

Pencillin ✗

cephalosporin ممكن يتجاوب بس لخطورة المرض نستخدم

Diagnosis


Neisseria gonorrhoeae and Neisseria meningitidis Flow Chart
negative
Glucose Maltose
Glucose positive
Neisseria gonorrhoeae
Sugar Utilization
Microscopic Appearance
Kidney bean shaped Gram negative diplococci
Growth in Culture
Use chocolate agar or Thayer Martin agar
Fastidious
Capnophilic
Will not grow at 22°C
Positive
Oxidase Test
Glucose Maltose
Glucose Positive, Maltose Positive
Neisseria meningintis

Prophylaxis and vaccination

- Chemoprophylaxis of close contacts (if susceptible)
- Polyvalent vaccine containing serogroups A, C, Y, and W135 is effective for immunoprophylaxis as an adjunct to chemoprophylaxis
- Serogroup B is only weakly immunogenic and protection must be acquired naturally from exposure to cross-reacting antigens

لقاح متعدد الأولي

Thank you....