

# *Acinetobacter*

## **Habitat**

They are distributed in soil and water and can occasionally be cultured from skin, mucous membranes, secretions, and the hospital environment. *Acinetobacter baumannii* is the species most commonly isolated. *Acinetobacter haemolyticus*, and other species are isolated occasionally.

## **Morphology**

Aerobic gram-negative . Cocci or coccobacilli appearance; diplococcal forms predominate in body fluids and on solid media. Rod-shaped forms also occur. It can grow well on most types of media. *Acinetobacter* recovered from patients with meningitis and bacteremia has been mistaken for *Neisseria meningitidis*; similarly, *Acinetobacter* recovered from the female genital tract has been mistaken for *Neisseria gonorrhoeae*. However, the *Neisseria* produce oxidase, and *Acinetobacter* does not.

## **Pathogenesis**

They often are commensals but occasionally cause nosocomial infection. *A baumannii* has been isolated from blood, sputum, skin, pleural fluid, and urine, usually in device-associated infections. *A johnsonii* is a nosocomial pathogen of low virulence and has been found in blood cultures of patients with plastic intravenous catheters. In patients with *Acinetobacter* bacteremias, intravenous catheters are almost always the source of infection. In patients with burns or with immune deficiencies, act as opportunistic pathogens and can produce sepsis.

## **Treatment**

Strains are often multidrug resistant. In many cases, the only active agent may be colistin. The more susceptible *Acinetobacter* strains respond most commonly to gentamicin, amikacin, or tobramycin and to extended spectrum penicillins or cephalosporins.

# *Neisseria*

## **Morphology and culture**

Gram-negative, aerobic cocci that are often arranged in pairs (diplococci), Some are Normal flora others are pathogenic. They are typical mucosal parasites that die rapidly outside the human organism. Culturing on enriched nutrient mediums is readily feasible.

## *Neisseria gonorrhoeae*

### **Morphology and culture**

coffee-bean-shaped cocci. Gonococci can be grown on culture mediums enriched with protein (blood). The atmosphere for primary culturing must contain 5–10% CO<sub>2</sub>.

### **Pathogenesis**

It is the pathogen responsible for gonorrhoea. Infection results from sexual intercourse. The organisms adhere to cells of the urogenital tract by means of attachment pili and the protein Opa, penetrate into the organism cause a pyogenic infection. In men, the prostate and epididymis can also become infected.

In women, the gonococci can also cause salpingitis. If reaching the conjunctival membrane may cause a purulent conjunctivitis, in newborn children. Also cause arthritis or even endocarditis.

### **Diagnosis**

-Specimen: Purulent secretions.

-The method of detection microscopically is by means of methylene blue and gram staining

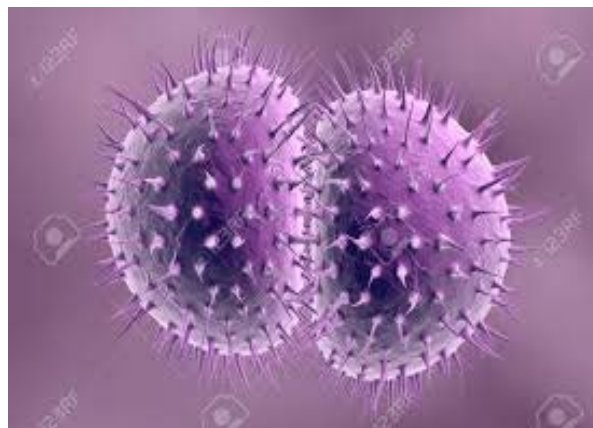
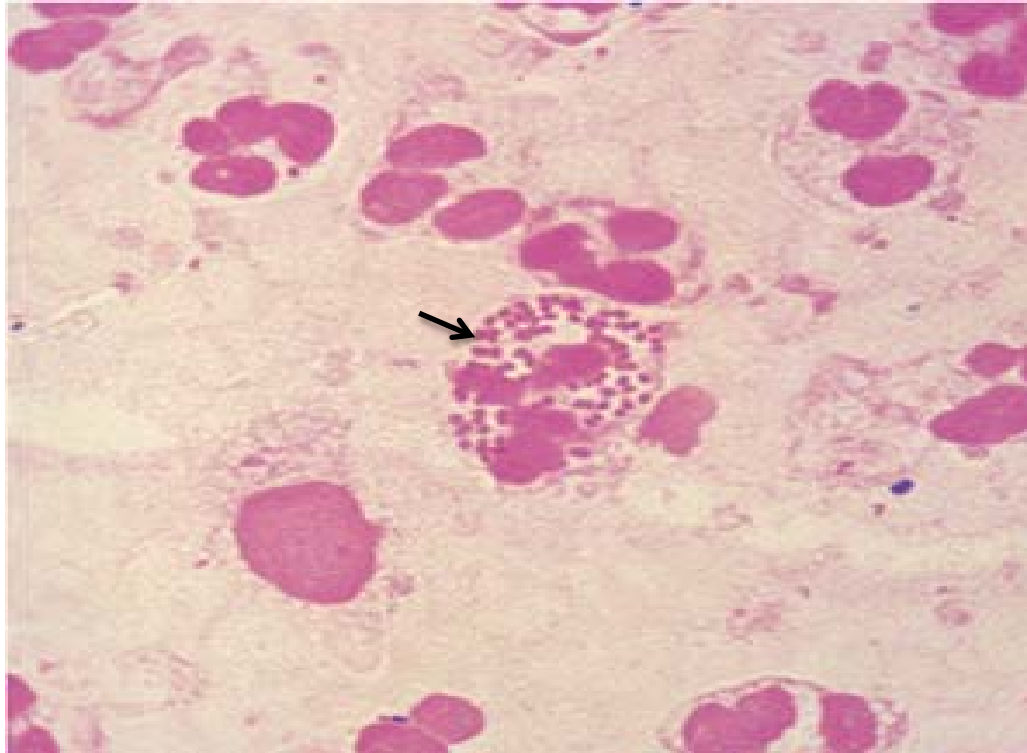
-Culturing. They are sensitive in cultures and the material must be used immediately.

-Biochemical tests.

-Immunofluorescence and coagglutination methods

## Treatment

The choice is penicillin G. Alternatives for use against penicillinase-positive gonococci include third-generation cephalosporins and 4-quinolones(eg; ciprofloxacin)



## *Neisseria meningitidis*

### Morphology

Meningococci are Gram-negative, coffee-beanshaped cocci that are frequently pleomorphic. Nonmotile and feature a polysaccharide capsule.

## **Culture**

Growing in cultures requires mediums containing blood .A concentration of 5–10% CO<sub>2</sub> encourages proliferation.

## **Pathogenesis and clinical picture.**

They cause Meningitis. They are infecting the nasopharyngeal mucosa. These microorganisms are carried by 5–10% of the population.They can also infect the lungs, endocardium, or major joints. Onset of the meningitis is usually sudden, with severe headache, fever, neck stiffness, and severe malaise. The disease occurs in the form of minor epidemics in children, youths, and young adults. Severe hemorrhagic sepsis sometimes develops.

## **Diagnosis**

-Specimen: cerebrospinal fluid and blood.

-Culturing: Success in culturing, the material must be used to inoculate blood agar without delay.

-Biochemical tests

-Slide agglutination test is used to determine the serogroup, and Latex coagglutination

## **Treatment**

Antibiotics of choice are penicillin G and third-generation cephalosporins.

## ***Haemophilus***

### ***Haemophilus influenzae.***

## **Morphology and culture**

Nonmotile, Gram-negative, small rod ,capsulated. Facultative anaerobe that requires growth factors X (hemin) and V (NAD, NADP) in its culture

medium. The X factor, required by the bacteria to synthesize enzymes containing heme (cytochromes, catalase, oxidases), this factor is reduced in anaerobic culturing. A standard blood agar plate does not contain sufficient free V factor. The medium normally used to culture *H. influenzae* is chocolate agar containing sufficient amounts of the X and V factors.

Some bacteria, in particular *S. aureus*, produce excess NAD and even secrete this coenzyme into the medium. That is why *H. influenzae* can proliferate in the immediate vicinity of *S. aureus* colonies. This is known as the satellite phenomenon. Other *Haemophilus* species either infect only animals or are found in the normal human mucosal flora

## **Pathogenesis**

It is a typical parasite of the respiratory tract mucosa. It occurs only in humans, in individuals with weakened immune defenses. Invasive infections-meningitis and sepsis-are also observed in small children. The non-capsulated strains usually little or no virulent. The body has built up a sufficient store of antibodies by the age of four. Any list of clinical developments:

- meningitis
- epiglottitis,
- pneumonia,
- empyema,
- septic arthritis
- otitis media, and others

## **Diagnosis**

- Specimen: Cerebrospinal fluid, blood, pus, or purulent sputum
- Microscopy : Gram staining
- Culture: Satelliting on blood agar is an indication of a V factor requirement. An X factor requirement is confirmed most readily by the porphyrin test, with a negative result in the presence of *H. influenzae*.
- Biochemical tests
- Immunological tests

## Treatment.

Since the number of betalactamase-producing strains increasing ; agent of choice in meningitis is ceftriaxone.

### - *Haemophilus influenzae*

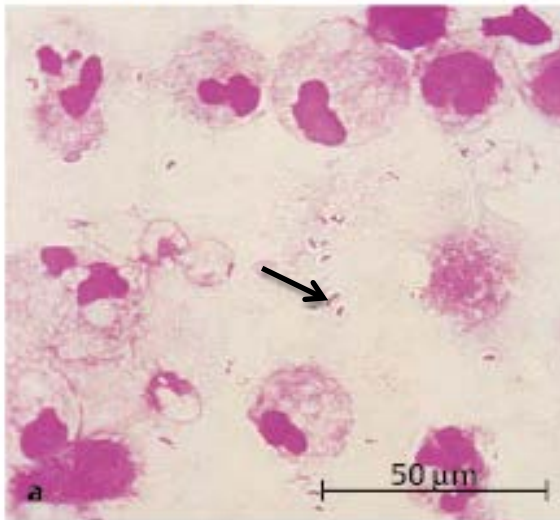


Fig.4.21 **a** Gram-stained cerebrospinal fluid sediment preparation. Fine, Gram-negative rods surrounded by a capsule (serovar b). Clinical diagnosis: purulent meningitis.

**b** Satellite colonies of *Haemophilus influenzae* surrounding the *Staphylococcus aureus* streak. *S. aureus* provides small amounts of V factor. The blood agar contains free X factor.

