

College of Medicine

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Microbiology Department

Neisseria gonorrhoeae, also known as *gonococci* ,or *gonococcus* is a species of Gram-negative coffee bean-shaped diplococci bacteria responsible for the sexually transmitted infection gonorrhea.

Laboratory diagnosis of gonorrhea.

Gonorrhea

Gonorrhea is caused by *Neisseria gonorrhoeae*. Samples are taken from the anterior portion of the male urethra and the endocervix of the uterus, or the posterior pharynx, the tonsils and the rectum in cases of orogenital or anal intercourse.

Laboratory diagnosis is based on the following.

1-Microscopy of a direct smear of the discharge stained with Gram stain reveals Gram-negative diplococci within polymorphonuclear leucocytes.

2-Culture *Neisseria* are fastidious Gram-negative cocci that require nutrient supplementation to grow in laboratory cultures. Specifically, they grow on chocolate agar with carbon dioxide.

Neisseria is usually isolated on Thayer-Martin agar ,an agar plate containing antibiotics (vancomycin, colistin, nystatin,)and nutrients that facilitate the growth of *Neisseria* species while inhibiting the growth of contaminating bacteria and fungi.

3-Gram stain: to show Gram-negative coffee bean-shaped diplococci bacteria within polymorphonuclear leucocytes.

4-Enzyme immunoassays (EIAs) can be used for quick identification of gonococcal urethritis with good sensitivity and specificity. These tests lack sensitivity and specificity when used for cervical, pharyngeal and rectal samples.

5-Molecular test by polymerase chain reaction tests (PCR)

6-Biochemical tests: oxidase test positive. And glucose fermented.

Neisseria meningitides

Neisseria meningitides is Gram negative pair shape ,non motile ,capsulated ,non spore forming .

Neisseria meningitidis, often referred to as *meningococcus*, is a bacterium that can cause meningitis and other forms of meningococcal disease such as meningococemia, a life-threatening sepsis. *N. meningitidis* is a major cause of morbidity and mortality during childhood in industrialized countries and has been responsible for epidemics in Africa and in Asia.

Upon Gram staining, it appears as a Gram-negative diplococcus and cultures of the bacteria test positive for the enzyme cytochrome c oxidase.

It exists as normal flora (nonpathogenic) in the nasopharynx of up to 5–15% of adults. It causes the only form of bacterial meningitis known to occur epidemically.

Meningococcus is spread through the exchange of saliva and other respiratory secretions during activities like coughing, sneezing, kissing, and chewing on toys.

Diagnosis

1-Specimen collection

The gold standard of diagnosis is isolation of *N. meningitidis* from sterile body fluid. A cerebrospinal fluid (CSF) specimen is sent to the laboratory immediately for identification of the organism. Blood taken for blood culture .Nasopharyngeal swab.

2-Direct examination :

Gram stained smears of the sediment of centrifuged CSF to examine typical *Neisseria* within polymorph nuclear leukocytes .

3-Culture

Culture *Neisseria* are fastidious Gram-negative cocci that require nutrient supplementation to grow in laboratory cultures. Specifically, they grow on chocolate agar with carbon dioxide.

Neisseria is usually isolated on Thayer-Martin agar ,an agar plate containing antibiotics (vancomycin, colistin, nystatin,)and nutrients that

facilitate the growth of *Neisseria* species while inhibiting the growth of contaminating bacteria and fungi.

4-Gram stain : Gram-negative diplococci within polymorphonuclear leucocytes.

5-Biochemical tests

Oxidase test positive reaction

Glucose and maltose fermented

6-Serological tests

A- Serology determines the subgroup of the organism by agglutination reactions with antisera prepared against cell surface antigen . the most common are A,B, C . group A strains account for the majority of case meningococcal meningitis in epidemic and are regarded as of higher pathogenicity than the other serotype which more usually found in the nasopharynx of healthy people.

B-ELISA .

7-Molecular test by polymerase chain reaction tests (PCR).

Organism	Glucose¹	Maltose	Lactose	Sucrose
<i>Neisseria meningitidis</i>	+	+	-	-
<i>Neisseria gonorrhoeae</i>	+	-	-	-
<i>Moraxella catarrhalis</i>	-	-	-	-