Haemophilus

Haemophilus species GNB, capsulated.

Require special growth factors present in blood V and X

Important species-

H.Influenza-Pneumonia and meningitis

H.Ducreyi-Chancroid

H.Aegypticus ,parainfluenza,haemolyticus

H.influenza-

- Also called as Pfeiffers bacillus
- Coined wrongly thought to cause influenza
- Growth requirements-
- Two growth factors present in blood
- a)Factor X-Heat stable compound composed of haemin,porphyrins required for synthesis of enzymes cytochrome,catalase,peroxidase for aerobic respiration

- b)Factor V-Heat labile NAD,gets inactivated by NADase present in sheep blood
- -Haemophilus doesnot grow in nutrient agar or peptone water
- -Growth scanty in blood agar
- -Good growth in chocolate agar
- -Satellitism

Serotyping-

Based on capsular polysaccharide typed in 6 serotypes a to f

Non capsular strains are non typeable

- H.Influenzae serotype b (Hib) most virulent and accounts for most of invasive infection
- Hib capsule has PRP ag induces IgG,IgM,IgA bactericidal,opsonic and protective hence PRP ag used for vaccination

Next to Hib non typeable strains are commonly isolated

Virulence factors-

Capsular polysaccharide

Endotoxin

Outer membrane proteins

IgA1 proteases

Pilli and adhesion proteins

Clinical manifestations-

- H.Influenza type B
- CNS infections-meningitis, Subdural effusions,
- Epiglottitis, pneumonia in infants

Non typeable-

Childhood otitis media,COPD exacerbations (most common bacterial cause),puerperal sepsis and neonatal bacteremia Lab diagnosis

- Specimens-csf,blood,sputum,pus, joint fluids,middle ear effusions
- Sample never be refrigerated
- Direct detection-
- Gram staining
- Capsule detection(quellung reaction)
- Ag detection-LA and IF test

Culture-

- Fastidious ,X and V factor requirement, aerobic
- Poor anaerobe,5 -10% co2
- Blood agar streked with S, aureus satellitism
- Chocolate agar
- Fildes agar and levinthal agar-Rbcs lysed by adding peptic digest(fildes) and heat(levinthal)
- Haemophilus selctive media with bacitracin and sucrose

Culture smear and motility testing

Biochemical tests-

Fermenter, nitrate to nitrite and catalse and oxidase positive

Disk test for X and V requirement

Typing methods-

Biotyping IOU, H. influenza 8 biotypes

Serotyping

AST-chocolate agar or fildes agar

Drugs of choice ceftriaxone or cefotaxime

- Non typeable strains are sensitive to quinolones or macrolides
- Prophylaxis by Hib conjugate vaccine

Chemoprophylaxis by rifampin for contacts

Haemophilus ducreyi

Chancroid or soft chancre STD char by

Painful genital ulceration bleeds easily with no inflammation and enlarged tender inguinal lymph nodes(bubo)

No immunity following infection

Epidemiology-heterosexual,more in males,increases susceptibility to hiv

Lab diagnosis-

Specimen collection-swab from ulcer or lymph node aspirate

Direct microscopy-Pleomorphic gram negative coccobacilli, bipolar staining, arrangement school of fish or rail road track appearance

Culture-requires only factor X ,grown on rabbit blood agar or chocolate agar with vancomycin And can also be grown on CAM of chick embryo Colonies small grey and translucent Slide agglutination test

Multiplex PCR for herpes, H.ducreyi and

Treponema pallidum

Treatment-Azithromycin

HACEK group

Abbreviation to represent fastidious slow growing gnb that reside in oral cavity as commensal but occasionally have been associated with local infections of mouth and systemic infections such as bacterial endocarditis

HACEK

- H-Haemophilus parainfluenza
- A-Aggregatibacteractinomycetemcomitans
- C-Cardiobacterium hominis
- E-Eikenella corrodens
- K-Kingella kingae

Hacek endocarditis

- Accounts for 3% cases of endocarditis
- Subacute course
- Preexcisting valvular defects or dental procedures
- Common aortic and mitral valve

Lab diagnosis

Fastidious requires special media

- 5-10% co2 required
- 30 days incubation required but 1 week in case of automated systems

PCR employed

Treatment by quinolones and ceftriaxone