

# Haemophilus influenzae

*Haemophilus influenzae* is a pleomorphic gram-negative rod. They are divided according to serotype into groups a-f, of which the most dangerous is group b. Virulent strains can cause dangerous childhood epiglottitis, purulent respiratory infections or meningitis. Invasive hemophilic diseases have virtually disappeared in children thanks to the introduction of a widespread vaccination of infants against H. influenzae group b.

H. influenzae was originally thought to be the cause of the flu (found in the blood of flu epidemics), but it has nothing to do with it. However, the bacterium can mount an existing viral (flu) disease in the form of a superinfection.

## Morphology

A facultatively anaerobic, immobile, non-sporulating gram-negative coccoid rod which may form chains. It requires the presence of factors **X** (= hemin) and **V** (= NAD) for growth.

## Cultivation

It forms small colonies "like dewdrops", requires factor X and V to grow. It grows on blood agar only near staphylococci or micrococci (= **satelliteism**, it receives NAD from them).

## Laboratory diagnostics

- **Swelling of the capsules** (Quellung reaction) - mix with a specific antiserum and stain with methylene blue, observe under a microscope.
- **Group b polysaccharide detection** (immunofluorescence, RIA).

## Antigens and toxicity

- **Capsule antigens** determine group affiliation (type a-f);
- **body antigens**;
- "Ciliostatic substance" - damages the cilia of the epithelium, it is probably an **endotoxin**.

## Patogenesis

Virulence is conditioned by the presence of the capsule, non-encapsulated strains are part of the normal flora of the upper respiratory tract. The most virulent is type b. Pili enhance adherence, IgA protease.

## Diseases

- Hemophilic epiglottitis - life-threatening, the child appears calm (saves breath), does not want to swallow (drooling), do not touch the throat much (there is a risk of laryngospasm), does not want to lie down (lying down can cause the epiglottis to bog down and result in death).
- Pneumonia.
- Otitis media.
- Sinusitis.
- Meningitis purulenta - mainly in children (most common etiological agent of meningitis up to 2 years). They are also at risk of permanent neurological damages. In adults, it is often a complication of an upper respiratory tract infections.

## Treatment

- **Aminopenicillins**, 20% produce  $\beta$ -lactamase → with inhibitor.
- **Chloramphenicol**.
- **Sulfisoxazole + streptomycin**.
- **Cephalosporins**.

## Prevention

The *Haemophilus influenzae* type b capsular polysaccharide vaccine is part of the mandatory hexavaccine.

## Links

## Similar articles

- Epiglottitis

## Literature

- BEDNÁŘ, M, et al. *Lékařská mikrobiologie*. 1. vydání. Marvil, s. r. o., 1996. s. 278–280. ISBN 80-238-0297-6.
- Ústav lékařské mikrobiologie 3. LF UK. *Repetitorium bakteriologie – Haemophilus influenzae* [online]. [cit. 6. 2. 2010]. <<http://mikrobiologie.lf3.cuni.cz/ustavy/mikrobiologie/rep/hain.htm>>.

## Source

- ws:Haemophilus influenzae