Salmonella

Template:Infobox - bakterie This bacterial species belongs to the G− family of *Enterobacteriaceae* rods. Until recently, salmonella serotypes were considered as different separate species. Genetic analysis revealed that it was a single species called ***Salmonella enterica*** divided into seven subspecies. For humans, pathogenic species are included in the "enterica" subspecies. ***Salmonella enterica*** **subsp.** ***enterica*** includes several serovars with several important human pathogens – ***Salmonella Typhi, Salmonella Paratyphi, Salmonella Typhimurium, Salmonella Enteritidis****...*

Salmonella Typhi

- Exclusively **anthropopathogenic**;
- relatively resistant to drying out, tolerates sub-freezing temperatures and survives in water and milk;
- it is destroyed by common disinfectants and temperatures above 60 °C;
- ferments glucose, mannitol and sorbitol;
- lactose and sucrose negative;
- forms H_2S.

Cultivation

- It grows on common culture media, selective and selective diagnostic soils (Endo's soil, DC agar, SS agar, etc.) are used for identification,
- It grows on **lactose agar** in the form of colourless colonies.
- Black colonies with a bismuth mirror grow on selective **Wilson-Blair bismuth-sulfite agar**.

Antigenic structure

- O-antigen types 9 and 12;
- flagellar H-antigen type d;
- surface Vi antigens.

Typhoid fever

- The incubation period for typhoid fever is about 7-14 days;
- septic disease;
- entrance gate - GIT mucosa;
- carrier: long-term (even lifelong) – gallbladder and bile ducts.

The incubation period lasts about 14 days, multiplies in the macrophages of the Peyer's patches, then the bacteria reach the lymph node, where they continue to multiply. From here they enter the circulation, a **septic condition** occurs, characterized by hyperpyrexia, headaches, impaired consciousness and red spots on the skin. The acute phase lasts several weeks.

Asymptomatic carrier

- The disease may not manifest itself, the bacteria settle in the gallbladder, from where they enter the stool and other people may become infected.

Clinical signs

- Septic temperatures, headaches, loss of appetite, pink patches on the skin, diarrhoea, intestinal perforations.

Epidemiology

- The source is exclusively human, symptomatic or bacillus carrier;
- contaminated water, soil, waste, food;
- countries with a low hygienic standard.

- The infection is possible by transmission from an infected person (the patient excretes bacteria in the urine or faeces), by food (contaminated water).

Immunity

- **The cell-type immunity** is solid and long-lasting after overcoming the disease.

Laboratory diagnostics

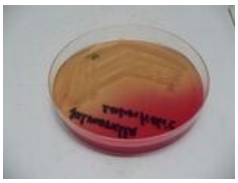
- Isolation of bacteria from blood, urine, exceptionally faeces;
- **Widal reaction** - determination of antibodies against O, H and Vi antigens from blood.

Therapy

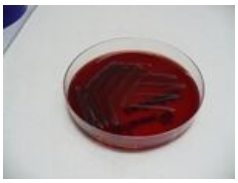
- ATB - fluoroquinolones, ampicillin, chloramphenicol are used (in complicated cases).
- In bacillus carrier is the ATB therapy often ineffective; cholecystectomy is performed.

Prevention is possible by administering a vaccine with salmonella deficient mutants. It is recommended when visiting countries with a low hygienic standard. The vaccine does not start working until 2 weeks later, it is effective for about 3 years.

Cultivation of *Salmonella* Enteritidis on **DC**



Cultivation of *Salmonella* Enteritidis on **Endo's soil**



Cultivation of *Salmonella* Enteritidis on **blood agar**

Salmonella Paratyphi B

- It is the only paratyphoid salmonella in our territory (Czechia).

Clinical signs

- We can say that it is a mild form of typhoid fever.

Laboratory diagnostics and therapy

- Same as typhoid fever

Other salmonella

- Most **salmonelloses** are caused by zooanthropopathogenic salmonella serotypes, which occur primarily in animals.
- Alimentary infections of people occur through insufficiently heat-treated foods or egg products - mayonnaise, creams, spreads, ice cream.

Salmonella Typhimurium a Salmonella Enteritidis

- The most common cause of explosive infections epidemically affecting people, which is shared by eating together.

Pathogenicity

- Certain components of the **O-antigen** block phagocytosis or prevent complement activation in an alternative way.
- Some strains produce **cytotoxins** that damage epithelial cells or sometimes enterotoxin.

Clinical signs

- The most well-known form is **gastroenteritis - "salmonellosis"** - nausea, vomiting, abdominal pain, fever.
- The disease subsides in 1-3 days, but the excretion of salmonella persists for weeks.
- **Metastatic purulent forms** - in bones, on meninges in joints − cause certain serotypes: **S. Cholereasuis, S. Dublin, S. Panama**.

Laboratory diagnostics

- Stool is sent for cultivation, or suspicious food;
- in the metastatic form: blood, pus, cerebrospinal fluid...

Therapy

- Necessary detection of ATB sensitivity in the treatment of the extraintestinal form;
- in gastroenteritis, we administer antiseptics and hydrate.

Links

Related articles

- Salmonella enteritis
- Typhoid
- Microbiology Repetitorium

References

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- BEDNÁŘ, Marek – SOUČEK, Andrej – FRAŇKOVÁ, Věra, et al. *Medical Microbiology : Bacteriology, virology, parasitology.* 1. edition. Prague : Marvil, 1999. 558 pp. ISBN 8023802976.
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