Gram-negative anaerobic rods and cocci

Bacteria from group G− anaerobes belong to species that are difficult to cultivate, therefore it is difficult to identify them as the causative agent of the disease. We include the clinically important genera ***Bacteroides, Prevotella, Fusobacterium, Mobiluncus*** **a** ***Veillonella***. [1]

Gram-negative anaerobic rods

Anaerobic G− bacilli form the normal flora of mucous membranes, often acting as **secondary pathogens**. These are pleomorphic bacteria that are difficult to cultivate. The main pathogenic mechanism is non-specific tissue damage by the acids produced.Bakteroidy a fusobakteria they produce enzymes that facilitate their penetration into tissues and spread.

These bacteria can cause infections anywhere in the human body: oral, pleuropulmonary, intra-abdominal, periodontal, also in the small pelvis and female genital infections. They are an infectious agent even in tissues damaged by injury or surgery. abscesses filled with foul-smelling pus form in the affected area. They are used for therapy *lincomycin, chloramphenicol, clindamycin and metronidazole*, it is often necessary to choose a *surgical intervention* (incision, drainage). [2] [3]

Bacteroides spp.

Bacteria of the genus *Bacteroides* are an important part of the natural intestinal flora, some species are potentially pathogenic. Their membrane contains sphingolipids , they have diaminopimelic acid in the wall. *Bacteroides* are **gram-negative pleomorphic rods** with rounded ends, usually **encapsulated** . They are characterized by **resistance** to bile acids . They massively colonize the large and small intestine, where they play a role in the digestion of complex molecules, the upper respiratory tract. In the vagina, it belongs to the commensal species B. fragilis, B. capillosus or B. ureolyticus . Their endotoxin has little biological activity.

Pathogenicity

The most important pathogens include **B. fragilis** with a polysaccharide capsule as a virulence factor. It can cause peritonitis , surgical infections in the digestive tract, and appendicitis . It inhibits phagocytosis and, like other species of this genus, is resistant to beta-lactams , aminoglycosides , and recently species resistant to erythromycin and tetracycline have appeared. The genus *Bacteroides* also includes, for example, *B. ovatus* , *B. vulgatus* and *B. gracilis*. [4]

Prevotella spp.

Bacteria of the genus Prevotella are **gram-negative anaerobic fermenting rods** related to the genus Bacteroides. Individual species are, for example, *P. oris*, *P. buccae*, *P. dentalis* and *P. melaninogenica*. Diseases caused by these bacteria include wound , urinary and respiratory infections (angina , sinusitis), they can also be an infectious agent in the formation of abscesses in the oral cavity, for example after a human bite. Due to the production of beta-lactamase, they are resistant to beta-lactam antibiotics. [5] [3]

Fusobacterium spp.

The genus Fusobacterium includes **gram-negative anaerobic rods** that are part of the natural bacterial flora of the upper respiratory tract, digestive and genital tracts. Pathogenic species include *F. necrophorum* and *F. nucleatum*. Fusobacteria cause surgical and traumatic wound infections, complicate animal bite wounds, can be identified in mixed cultures in pneumonia, chest empyema, intra-abdominal infection and abscesses. Rarely, they can cause osteomyelitis.

F. nucleatum is part of dental plaque , invasiveness is enabled by the ability to adhere to both G− and G+ biofilm . Bacteria can also cause periodontitis. **F. necrophorum** is the cause of serious infections in children and adolescents, the severe condition is **necrotizing tonsillitis** accompanied by the formation of blisters and abscesses. [6] [7] [8]

Mobiluncus spp.

Bacteria of the genus Mobiluncus are **gram- labile anaerobic motile rods** . They tend to be isolated in women with bacterial **vaginosis** , often together with Gardenerella vaginalis and other bacteria. At the same time, they are also found in women without clinical symptoms. We include M. curtisii and M. mulieris in this genus . [9] [10] [3]

Gram-negative anaerobic cocci

The G− group of anaerobic cocci includes *Acidaminococcus spp.*, *Megasphaera spp.*, which are part of the natural bacterial flora of humans. Bacteria of the genus *Veillonella* are clinically important. [3]

Veillonella spp.

The genus *Veillonella* belongs to **gram-negative anaerobic cocci**, which mostly form clusters or pairs. They fluoresce red under UV light. It belongs to the natural flora of the oral cavity, nasopharynx, digestive tract and female genitalia. They can cause *mixed infections* , exceptionally they have been identified as the causative agents of meningitis , osteomyelitis and periodontal infections. We include *V. parvula*, *V. montpellierensis* or *V. alcalescens* in this genus. *V. parvula* can cause endocarditis. [3] [11] [12]

Links

Reference

1. GLOBALRPh. *Anaerobes (gram positive and negative):* [online]. [cit. 2014-10-19]. <http://www.globalrph.com/bacterial-strains-anaerobic.htm>.
2. BARON, S. *Anaerobic Gram-Negative Bacilli* [online]. [cit. 2014-10-18]. <https://www.ncbi.nlm.nih.gov/books/NBK8438/>.
3. VOTAVA, Miroslav. *Lékařská mikrobiologie speciální.* 1. edition. Brno : Neptun, 2003. ISBN 80-902896-6-5.
4. * BENEŠ, Jiří, et al. *Infectious medicine.* 1. edition. Galén, 2009. 651 pp. pp. 266-267. ISBN 978-80-7262-644-1.
5. ITZHAK, Brook. *Bacteroides Infection* [online]. [cit. 2014-10-18]. <https://emedicine.medscape.com/article/233339-overview>.
6. *Public Health Agency of Canada. *Fusobacterium spp* [online]. [cit. 2014-10-18]. <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/fusobacterium.html>.
7. BENNET, K. W. *Fusobacteria : new taxonomy and related diseases* [online]. [cit. 2014-10-18]. <http://jmm.microbiologyresearch.org/content/journal/jmm/10.1099/00222615-39-4-246?crawler=true&mimetype=application/pdf,>.
8. Microbewiki. *Fusobacterium* [online]. [cit. 2014-10-18]. <https://microbewiki.kenyon.edu/index.php/Fusobacterium>.
9. (EDITOR), David Greenwood BSc PhD DSc FRCPath – GREENWOOD, David – (EDITOR), Michael R. Barer MBBS PhD FRCPath, et al. *Medical microbiology : a guide to microbial infections.* 18. edition. Edinburgh ; London ; New York ; Oxford ; Philadelphia ; St. Louis ; Sydney ; Toronto : Elsevier, 2012. ISBN 9780702040894.
10. VETERE, A. *Characterisation of anaerobic curved rods (Mobiluncus spp.) isolated from the urogenital tract* [online]. [cit. 2014-10-19]. <http://jmm.microbiologyresearch.org/deliver/fulltext/jmm/23/3/medmicro-23-3-279.pdf?itemId=/content/journal/jmm/10.1099/00222615-23-3-279mimeType=application/pdf>.
11. MicrobeWiki. *Veillonella parvula* [online]. [cit. 2014-10-19]. <https://microbewiki.kenyon.edu/index.php/Veillonella_parvula>.
12. BHATTI, Maqsood A. *Veillonella parvula Meningitis: Case Report and Review of Veillonella Infections* [online]. [cit. 2014-10-19]. <https://academic.oup.com/cid/article/31/3/839/299845>.