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Impact of iron availability on survivability of selected bacteria of *Neisseria* genus

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Introduction: Effective pathogen invasion requires an environment which provides proper concentration of essential ions so in which bacteria population can grow up and successfully colonize. Iron is a very important factor for almost all organisms around the world. It is necessary for a basic life processes such as for example DNA biosynthesis. The bioavailability of free iron ions is difficult and it is often a limiting factor for microorganism life. *Neisseria gonorrhoeae* is the obligatory pathogen for a human and is an etiological factor of gonorrhoea disease, which is a global health problem. *Neisseria sicca* and *Neisseria lactamica* are examples of commensal bacteria, common in human upper respiratory tract. However, during immune deficiencies, they can cause diseases such as sepsis, arthritis or pneumonia. *N. gonorrhoeae* as well as *N. sicca* and *N. lactamica* needs iron ions for survival in the environment.

Materials and Methods: Bacterial strains: *Neisseria gonorrhoeae* FA 1090 ATCC 700825, *Neisseria sicca* ATCC 29256 and *Neisseria lactamica* ATCC 23970 were grown in liquid GC medium with different availability and amount of iron: + 250 μM $\text{Fe}_3(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ and; + 500 μM desferal (iron ions chelator). Controls were grown under standard conditions. Three times of culture incubation were tested: 1h, 4h and 24h. After incubation, the OD600 of the culture was measured. Additionally, formed biofilm was stained with crystalline violet, dissolved in ethanol and OD570 was measured.

Results: After 1h and 4h, neither for iron ions and desferal there are not statistical significance in survivability and in forming biofilm. After 24h addition of desferal significantly reduced bacterial growth in all tested bacteria species. Furthermore after 24h desferal induced forming biofilm in *N. gonorrhoeae* ($p < 0,005$). but reduced in *N. sicca* and *N. lactamica*. Iron ions reduced forming biofilm in *N. sicca* ($p < 0,005$) but stimulated in *N. lactamica* ($p < 0,05$).

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