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

Michał Styczyński, Jagoda Płaczkiewicz, Agnieszka Kwiatek
Department of Virology, Institute of Microbiology, Faculty of Biology, University of Warsaw

INTRODUCTION:

Effective pathogen invasion requires an environment which provide 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 gonorrhea 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
- *Neisseria lactamica* ATCC 23970

Bacterial cultures were grown in liquid GC medium with different availability and amount of iron:

(i) + 250 µM $Fe_3(NO_3)_3 \cdot 9H_2O$

(ii) + 500 µM desferal (iron ions chelator)

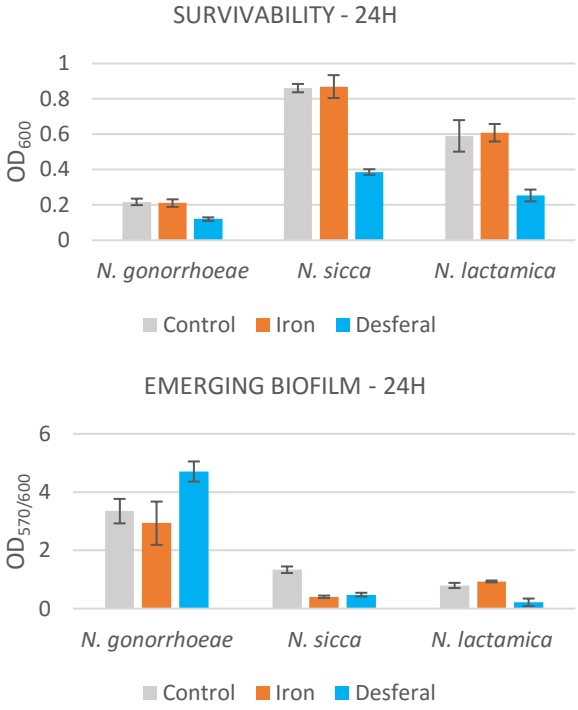
Controls were grown under standard conditions.

Three times of culture incubation were tested:

1h, 4h and 24h.

After incubation, the OD_{600} of the culture was measured.

Additionaly, formed biofilm was stained with crystalline violet, dissolved in ethanol and OD_{570} 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.

Futhermore after 24h desferal induced forming biofilm in *N. gonorrhoeae* ** but reduced in *N. sicca* and *N. lactamica*. Iron ions reduced forming biofilm in *N. sicca*** but stimulated in *N. lactamica**.

***p<0,05 ** p<0,005**

RECENT PUBICATIONS:

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- K. H. Changal, A. Raina, S. S. Altaf, Neisseria lactamica Causing a Lung Cavity and Skin Rash in a Renal Transplant Patient: First Report from India. *Case Rep Infect Dis* 2016, 1932963 (2016).
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BIOGRAPHY:

Michał Styczyński, student of Biotechnology in Department of Virology at University of Warsaw. He is working on human epithelium tissues such as HEC-1B and ME-180 and with bacteria from *Neisseria* genus. Michał is interested in LSCM and SEM microscopy, and he is already exploring structure of *Neisseria gonorrhoeae* biofilms. Michał is also very interested in bioremediation and application of practical biotechnologies.

E-mail: michal@coecco.com

NOTES/COMMENTS: