Diversity and dynamics of resistotypes of Staphylococcus aureus during chronic airway infection of cystic fibrosis patients

Lena Ueberhorst\textsuperscript{1}, Theo Thissen\textsuperscript{1}, Björn Husmann\textsuperscript{1}, Susanne Deiwick\textsuperscript{1}, Heike Rengbers\textsuperscript{1}, Angelika Dübbers\textsuperscript{2}, Christina Keßler\textsuperscript{3}, Peter Küster\textsuperscript{4}, Holger Schüttingkemper\textsuperscript{5}, Claudia Neumann\textsuperscript{1}, Barbara C. Kahl*\textsuperscript{6}

\textsuperscript{1}University Clinics Münster; Medical Microbiology

\textsuperscript{2}University Hospital Münster; Department of Pediatrics

\textsuperscript{3}University Clinics Münster; Pediatrics

\textsuperscript{4}Clemenshospital Münster

\textsuperscript{5}Clemenshospital Münster; Pediatrics

\textsuperscript{6}Institut für Med. Mikrobiologie Universitätsklinikum Münster; Medical Microbiology

Background: Cystic fibrosis patients suffer from chronic recurrent bacterial airway infections which ultimatively lead to lung insufficiency and decreased life expectancy. Staphylococcus aureus is one of the earliest and one of the most common pathogens isolated from the airways of CF patients. The diversity of resistotypes of S. aureus during chronic airway infection is not known. Therefore, we conducted a prospective study to determine the dynamics of resistotypes in the lung habitat of patients chronically infected by S. aureus in a one-year period.

Material/methods: We selected 14 patients of 2 CF-centers in Münster, who were persistently infected by S. aureus and regularly expectorate sputum. From every sputum we isolated 40 colonies and determined resistance to β-lactams, lincosamids, clindamycin, gentamicin, fluorquinolones and rifampin and spa-types.

Results: The median age of patients was 24 years (range 16, 45). Nine patients (70%) were co-infected by Pseudomonas aeruginosa. Preliminary results of 52 sputa (n=2080 isolates) from 14 patients revealed a high diversity of resistotypes within individual sputa (1 -7 resistotypes/sputum,
The number of resistotypes varied during sequential visits. 226 (11%) isolates were PSSA, 1448 (70%) MSSA and 406 (19%) MRSA. In 19 of 48 sputa (40%), only a single clone was determined, whereas in 13 sputa variants of the spa type and in 13 sputa different spa types were identified, in 4 of these sputa, isolates with spa types reflecting microevolution as well as isolates with spa types reflecting different clones were identified.

Conclusions: Our preliminary results revealed a high diversity of *S. aureus* resistotypes and spa types during persistent airway infection, which varied within and also between patients. Associations of changing resistotypes with bacterial density, exacerbation, co-infection with *P. aeruginosa* or antibiotic therapy will be further evaluated.