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

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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 ß-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,

mean 3). 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.