

Analysis of biofilm production in *Enterococcus faecium* strains depending on clinical source

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ABSTRACT

Purpose: *Enterococcus faecium* strains have been reported worldwide as etiologic factors of many nosocomial infections, which are difficult to manage because of the constantly increasing resistance of these microorganisms to antibiotics and the ability to form biofilm. The aim of this study was to analyze the ability to produce a biofilm in *E. faecium* strains, depending on the patient's clinical material.

Materials and methods: Sixty-six *E. faecium* strains were investigated. Identification and susceptibility testing were conducted by the VITEK2 system. The ability to form biofilm was assessed by phenotypic methods. The presence of selected virulence genes was established by PCR followed by gel electrophoresis and sequencing.

Results: Among the tested *E. faecium* isolates, 72.7% were biofilm-positive (BIO+) and 27.3% biofilm-negative (BIO-). Strains were collected mostly from rectal swabs (30.4%) and blood

(18.3%). BIO+ strains from infections constituted 31.8% (52.4% isolated from blood) and from colonization 40.9% (48.2% from rectal swabs). 91.7% of the Blood Group strains and 68.5% of the Other Group strains produced biofilm. Strains from the Colonization Group produced biofilm in a proportion similar to the Infection Group (about 75%). There were no statistically significant differences in virulence and resistance, except for vancomycin (more resistant BIO+ Other than the BIO+ Blood Group, and more resistant BIO+ Colonization than BIO+ Infection Group) and teicoplanin (more resistant BIO+ Colonization than the BIO+ Infection Group).

Conclusion: The majority of *E. faecium* isolates carries high levels of resistance to many antimicrobials, is well equipped with virulence genes, and possesses the ability to form biofilm.

Key words: *Enterococcus faecium*, biofilm, antibiotic, resistance, virulence