

TITLE: BIOFILM PRODUCTION BY PENICILLIN-SUSCEPTIBLE AND PENICILLIN-RESISTANT *Enterococcus faecalis* CLINICAL ISOLATES

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ABSTRACT:

Enterococci, natural inhabitants of the oral cavity, normal intestinal microbiota, and genital tract of both human and animals, are recognized as opportunistic pathogens in urinary tract infections, bloodstream, intra-abdominal and surgical wounds. *Enterococcus faecalis* is the most common enterococci species, and it is responsible for 80–90% of human enterococcal infections. The ability to form biofilms has been considered an important mechanism of virulence among *E. faecalis* strains. Biofilms are microbial communities attached to a biotic and abiotic surfaces, involved by an exopolymeric matrix. The aim of this study was to evaluate the *in vitro* biofilm formation by clinical strains of *E. faecalis* identified as sensitive and resistant to penicillin. The strains of *E. faecalis* were previously isolated from clinical samples taken from patients attended at a university hospital in Uberaba, MG. Overnight bacterial cultures were diluted in BHI medium until an OD=0.1, and transferred to 96-well plates; the plates were incubated for 18 h at 37 °C and the biofilm formation was assayed by staining of polystyrene-attached cells with crystal violet. Optical density measurements obtained at 570 nm were corrected for blanks. *E. faecalis* ATCC 29212 was used as positive control. All the strains evaluated were capable of producing biofilms. Among the penicillin-susceptible *E. faecalis* (PSEF), only the strain 155 was classified as a strong biofilm producer; the strains 175 and 221 were considered moderate biofilm producers, while strains (07, 228 and 277) were poor biofilm producers. Regarding the penicillin-resistant *E. faecalis* (PREF), all strains (n=6) were classified as moderately biofilm producers. Among the eight isolates with moderate biofilm production, five were isolated from wounds (PSEF 175 and the PREF 157, 250, 269 and 313). Among the urine isolates, two were moderate producers of biofilm (PREF 20 and PSEF 221), and one (PSEF 07) was a weak producer. PSEF 155, isolated from a blood sample, was the

only one classified as strong biofilm producer. In this work, 100% of the evaluated strains showed the capacity to adhere to microtiter plates, suggesting that the biofilm formation may play a critical role in infections caused by *E. faecalis*. As the greatest biofilm production was observed among penicillin-resistant isolates, there may be a relationship between biofilm production and penicillin resistance.

Key words: *Enterococcus faecalis*, biofilm, opportunistic infections.

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