

Formation of bacterial biofilms enterobacteriaceae, isolates from patients with rheumatoid arthritis

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The role of opportunistic pathogens in rheumatic diseases being studied by many researchers. A large amount of data supports the notion that rheumatoid arthritis, likely due to asymptomatic urinary tract infections caused by bacteria of the genus *Proteus*. In the serum of patients with rheumatoid arthritis were significantly more likely develop antibodies to the antigens of the bacteria of the Enterobacteriaceae family and examines the role of these organisms in the etiopathogenesis of the disease. All members of the gut microflora in humans exist in the biofilm. Since the formation of biofilms also begins to develop any infection.

Objective: to study biofilm formation by microorganisms of the family Enterobacteriaceae, isolated from patients with rheumatoid arthritis.

Design and methods. Studied 111 strains of microorganisms of the family Enterobacteriaceae, including 56 strains isolated from patients with rheumatoid arthritis, and 55 clinical strains isolated in patients of the comparison group. Strains studied were obtained by bacteriological examination of 59 - rheumatoid arthritis. The diagnosis of rheumatoid arthritis according to the criteria established by the American Rheumatism Association (1987). Dominated by patients with I-II radiographic stage (71%) and in 29% of patients was determined by X-ray phase III of joint damage. Most of the patients (84.7%) had a degree of functional impairment II joints. I set the degree of RA activity at 30,5%, II - at 50.8% and III - in 18.6% of patients. Form of seropositive RA is set at 86.4% of patients in the other - seronegative Microorganisms isolated by bacteriological examination of patients. Identification of isolates was performed by morphological, tinctorial, cultural and fermentation characteristics according to the guidelines on the taxonomy of bacteria Bergen. Isolated bacteria of the family Enterobacteriaceae genera *Proteus*, *Escherichia*, *Enterobacter*, *Klebsiella*. As a comparison group were used clinical strains isolated from patients with inflammatory processes that are identical in species and generic supplies of microorganisms obtained from patients with rheumatoid arthritis. Microbial biofilm formation was assessed by the degree of crystal violet binding them in a sterile 96-well plates polisterolovyh (Merritt JH, Kadouri DE). The results take into account on the reader at a wavelength of 540 nm. Statistical analysis carried out on the IBM PC compatible computer using STATISTICA □ (Data analysis software system, StatSoft) version 7.0.

Results: The bacteria of the Enterobacteriaceae family with different frequency formed biofilm. Microorganisms of the genus *Proteus*, *Escherichia*, *Klebsiella*, isolated from rheumatoid arthritis patients, 100% of the biofilm formed. Biofilm formation found in 66.7% of the strains of bacteria of *Enterobacter*. Microorganisms isolated from individuals with a comparison with a frequency formed biofilm. In 100% of the formed biofilm bacteria of the genera *Proteus*,

Klebsiella. In 72.7% of the strains of bacteria of the genus Escherichia, and 75% - kind of Enterobacter established biofilm formation. Significant differences in the formation of biofilms found in bacteria of the genus Escherichia ($p < 0,05$). In this case, the bacteria of the genus Escherichia were characterized by more intense bioplenkoobrazovaniem. In cultures isolated from rheumatoid arthritis patients, the optical density reached values of $2,483 \pm 0,238$, cultures isolated from individual comparison group had an optical density of $1,342 \pm 0,379$ ($P < 0,0001$). Bacteria of the genera Proteus, Enterobacter, Klebsiella, isolated from patients with rheumatoid arthritis, have an optical platnost between the values obtained from comparison of individual groups ($p > 0,05$).

Conclusion: Patients with rheumatoid arthritis biofilm formation by bacteria of the family Enterobacteriaceae and has features can facilitate the participation of bacteria of the genus Escherichia in the pathological process.