MLI – 7

EFIKASNOST BIOCIDA U ERADIKACIJI *ACINETOBACTER BAUMANNII* BIOFILMA

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Sažetak: Produkcija biofilma je veoma značajan faktor virulencije bakterija, koji dodatno doprinosi rezistenciji na antibiotike i omogućava im preživljavanje nepovoljnih uslova. *Acinetobacter baumannii* je odličan produktor biofilma, koji predstavlja veliki izazov u terapiji intrahospitalnih infekcija, jer mu omogućava preživljavanje u bolničkoj sredini. Cilj rada je bio da se uporedi dejstvo različitih biocida na uklanjanje zrelog, formiranog biofilma koji su produkovali *A. baumannii* klinički izolati. U ovoj studiji je ispitana sposobnost produkcije biofilma kod 30 *A. baumannii* kliničkih izolata, metodom po Stepanoviću i saradnicima u mikrotitarskoj ploči sa bojenjem formiranog biofilma pomoću biološke boje gencijana ljubičasta. Sojevi su bili klasifikovani kao neproduktori, slabi, umjereni i jaki produktori na osnovu adsorbance gencijana ljubičasta boje mjerene pomoću spektorfotometra. Nakon toga je isprodukovani biofilm bio tretiran 10 minuta sa komercijalno dostupnim biocidima različitog sastava (1% natrijum hipohlorit-varikina, 70% alkohol i ekološki dezinficijens marke "Frosch"). Od ukupno 30 testiranih izolata, 5 izolata nisu isprodukovali biofilm, po 10 izolata su bili slabi i jaki produktori, a 5 izolata su klasifikovani kao umjereni produktori. Nakon dejstva sva tri dezinficijensa došlo je do značajne eradikacije biofilma, jer nakon tretmana sa sva tri biocida najveći broj sojeva prešao u neproduktore i slabe produktore biofilma ($p<0,001$, $p=0,01$, $p=0,04$). Najveći stepen uklanjanja biofilma utvrđen kod varikine (biofilm uklonjen u potpunosti kod svih izolata), dok su alkohol i ekološki dezinficijens podjednako djelovali (uklonili su biofilm kod 46%, odnosno kod 53% izolata). Na osnovu dobijenih rezultata možemo preporučiti varikinu kao najbolje sredstvo za uklanjanje produkovanog biofilma, pri čemu je veoma važno da se ostvari dužina kontakta između površine i biocida od 10 minuta.

Ključne riječi: biocidi, biofilm, *Acinetobacter baumannii*

THE POTENTIAL OF DIFFERENT BIOCIDES IN ERADICATION OF MATURE *ACINETOBACTER BAUMANNII* BIOFILM

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Apstract: Biofilm production is an important bacterial virulence factor, which contributes to bacterial resistance mechanisms to antibiotics and enables them to survive adverse conditions. *Acinetobacter baumannii* is an excellent biofilm producer and it represents a great challenge in the treatment of hospital infections, because it facilitates bacterial survival in the hospital environment. Aim of this study was to compare the efficacy of three different biocides in eradication of mature, performed *A. baumannii* biofilm. Biofilm production of 30 clinical isolates of *A. baumannii* was performed by method of Stepanovic *et al*. Strains were classified as biofilm-non producers or weak, moderate and strong biofilm producers according to OD of crystal violet dye, measured by spectrophotometer. Afterwards, mature biofilm was treated for 10 minutes with different comercially available biocides, such as 1% of sodium hypochlorite (bleach), 70% alcohol and ecological disinfectant "Frosch". Out of a total of 30 isolates tested, 5 isolates did not produce biofilm, 20 isolates were weak and strong producers (10 isolates in both groups), and 5 isolates were classified as moderate producers. There was a significant eradication of biofilm in tested isolates after the treatment of all three disinfectants. After treatment the majority of isolates became non- biofilm producers and weak biofilm producers ($p<0.001$, $p=0.01$, $p=0.04$). The best effect in biofilm removal was found with bleach (biofilm removed completely in all isolates), while alcohol and environmental-friendly disinfectant were equally effective (they removed biofilm in 46% and 53% of isolates, respectively). Based on the obtained results, we can recommend bleach as the best biocide for removing the mature biofilm. Also it should be emphasised that is very important to achieve a contact period of 10 minutes between the surface and the biocide.

Key words: biocides, biofilm, *Acinetobacter baumannii*