

ANTIMICROBIAL RESISTANCE PHENOTYPES OF *ACINETOBACTER BAUMANNII* BLOOD CULTURE ISOLATES IN TERTIARY-CARE HOSPITAL DURING A 2-YEAR PERIOD: JULY 2019- JULY 2021

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Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is a rapidly emerging pathogen in hospitals, able to evolve resistance to antibiotics and cause a spectrum of severe nosocomial infections in critically-ill patients, mainly in the intensive care units. This study aimed to investigate the isolation and antimicrobial susceptibility of *Acinetobacter baumannii* in blood cultures collected from inpatients in the University Clinical Center Kragujevac during a 2-year period (July 2019- July 2021). *Acinetobacter baumannii* isolated from positive blood cultures incubated in the automated blood culture system Bact/ALERT (bioMérieux, France), was identified in routine laboratory work. Antimicrobial susceptibility to β -lactam antibiotics, aminoglycosides, tetracycline, fluoroquinolones and trimethoprim-sulfamethoxazole was done by disk diffusion assay (Bio-Rad, UK). Minimum inhibitory concentrations were evaluated for colistin by ComASP Colistin (Liofilchem, Italy) and tigecycline by broth microdilution method with Mueller-Hinton broth (Bio-Rad, UK). The isolates were classified as multidrug-resistant, extensively drug-resistant and pandrug-resistant (1). During the study time there were 195 non-repetitive *Acinetobacter baumannii* blood isolates. Mostly (75.9%) were obtained from the COVID-19 period. Although comparing with pre-COVID-19 period the number of isolates has tripled statistical significance for antimicrobial resistance patterns was not observed. All isolates were CRAB and majority, 192 (98.5%) displayed both multidrug-resistant and extensively drug-resistant phenotype while three (1.5%) were pandrug-resistant. All pandrug-resistant isolates were from COVID-19 period. Our results raise serious concerns about the prevalence of CRAB isolates and available treatment options and CRAB is one of the critical-priority pathogens on the World Health Organization priority list of antibiotic-resistant bacteria for effective drug development (2).

References

1. Magiorakos AP, Srinivasan A, Carey RB, Carmeli Y, Falagas ME, Giske CG, et al. Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance. Clin Microbiol Infect. 2012;18(3):268–81.
2. Tacconelli E, Carrara E, Savoldi A, Harbath S, Mendelson M, Monnet DL et al. Discovery, research, and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. Lancet Infect Dis. 2018;18(3):318–27.

**FENOTIPOVI REZISTENCIJE *ACINETOBACTER BAUMANNII* IZOLATA IZ
HEMOKULTURA U BOLNICI TERCIJARNOG NIVOVA TOKOM DVOGODIŠNJEG
PERIODA: JULI 2019 - JULI 2021**

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Karbapenem-rezistentan *Acinetobacter baumannii* (KRAB) je zahvaljujući sposobnosti da razvije rezistenciju na sve trenutno dostupne antibiotike i izazove ozbiljne bolničke infekcije posebno kod teških pacijenata u jedinicama intenzivne nege svrstan u preteće patogene u bolničkoj sredini. Cilj ove studije bio je da ispita učestalost izolacije *Acinetobacter baumannii* sojeva iz hemokultura uzorkovanih pacijentima hospitalizovanim u Univerzitetskom kliničkom centru Kragujevac tokom dvogodišnjeg perioda (Juli 2019 - Juli 2021). *Acinetobacter baumannii* izolovan iz pozitivnih hemokultura inkubiranih u automatizovanom sistemu Bact/ALERT (bioMérieux, France) identifikovan je u rutinskom radu laboratorije. Osetljivost na β -laktamske antibiotike, aminoglikozide, tetracikline, fluorohinolone i trimetoprim-sulfametoksazol urađena je disk difuzionom metodom (Bio-Rad, UK). Minimalne inhibitorne koncentracije ispitane su za kolistin ComASP Colistin (Liofilchem, Italy) testom, a za tigeciklin bujon mikrodilucionom metodom u Miler Hinton bujonu (Bio-Rad, UK). Izolati su klasifikovani na multirezistentne, ekstenzivno rezistentne i panrezistentne (1). U razdoblju obuhvaćenom studijom iz uzoraka krvi izolovano je 195 neredovnih *Acinetobacter baumannii* sojeva, od kojih su većinu (75,9%) činili izolati iz COVID-19 perioda. Iako se u odnosu na pre-COVID-19 period broj izolata utrostručio statistički značajne razlike u osetljivosti na antimikrobne agense nije bilo. Svi izolati su ispoljili rezistenciju na karbapeneme. Kod 192 (98,5%) izolata detektovan je istovremeno multirezistentan i ekstenzivno rezistentan fenotip, a tri (1,5%) je bilo panrezistentno. Svi panrezistentni sojevi izolovani su tokom COVID-19 perioda. Rezultati ove studije pokazuju zabrinjavajuću činjenicu o prevalenciji KRAB izolata uz trenutno limitirane terapijske mogućnosti, a Svetska zdravstvena organizacija je KRAB uvrstila na listu prioritarnih rezistentnih patogena za koje je neophodan razvoj novih antimikrobnih agenasa (2).

Literatura

1. Magiorakos AP, Srinivasan A, Carey RB, Carmeli Y, Falagas ME, Giske CG, et al. Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance. Clin Microbiol Infect. 2012;18(3):268–81.
2. Tacconelli E, Carrara E, Savoldi A, Harbath S, Mendelson M, Monnet DL et al. Discovery, research, and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. Lancet Infect Dis. 2018;18(3):318–27.