

**ANTIMICROBIAL ACTIVITY OF SPIRONOLACTONE AGAINST  
*CUTIBACTERIUM ACNES***

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Spironolactone (SP) is being used as off-label systemic and topical acne therapy, due to its anti-androgen potential. Our previous study confirmed the safety of topical 5% SP preparations (1). *Cutibacterium acnes* (*C. acnes*) is an anaerobic Gram-positive bacillus that leads to severe acne skin lesions. Although there were some assumptions, there are currently no data on antimicrobial activity of SP. In this regard, we aimed to investigate the potential activity of SP against *C. acnes*. Two different samples were tested: 5% SP DMSO solution and 5% SP topical emulsion stabilized with alkyl polyglucoside (APG) sugar emulsifier. Minimum inhibitory concentration (MIC) was determined by a microwell dilution method according to the recommendations of the National Committee for Clinical Laboratory Standards (2). Vancomycin was used as positive, while DMSO was negative control. Both tested samples showed antimicrobial potential against *C. acnes* (ATCC 6919). The MIC values were 1.56 mg/g for 5% SP solution and 0.078 mg/g for 5% SP emulsion. These results showed that the antimicrobial activity of SP was better from the emulsion, which could indicate that APG emulsion vehicle can enhance antimicrobial activity of SP. DMSO showed minor activity against tested microbial strain confirming that antimicrobial activity depended on SP. On the other side, commercial antimicrobial drug vancomycin exhibited obviously higher antimicrobial activity than SP, as expected. SP *per se* and after incorporation into APG emulsion vehicle showed satisfactory antimicrobial activity against *C. acnes*. This supports its use in acne therapy, particularly regarding topical treatment of this common skin disease.

**References**

1. D.Ilić, M.Cvetković, M.Tasić-Kostov. Emulsions with alkyl polyglucosides as carriers for off-label topical spironolactone – safety and stability evaluation. *Pharm. Dev. Technol.* 2021; 26:3, 373-379.
2. NCCLS Document M100-S11, National Committee for Clinical Laboratory Standard, Wayne, PA, USA, 2003.

## ANTIMIKROBNA AKTIVNOST SPIRONOLAKTONA PREMA *CUTIBACTERIUM ACNES*

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Spironolakton (SP) se koristi u vidu "off-label" sistemske i lokalne terapije akni zahvaljujući antiandrogenom delovanju. Naša prethodna studija je potvrdila bezbednost primene kremova za primenu na koži sa 5% SP (1). *Cutibacterium acnes* (*C. acnes*) je anaerobni, Gram-pozitivni bacil koji je uključen u patologiju akni. Iako postoje navodi, trenutno nema istraživanja koja pokazuju antimikrobnu aktivnosti SP. S tim u vezi, cilj rada je bio da istražimo potencijalnu aktivnost SP prema *C. acnes*. Ispitivani su 5% rastvor SP u DMSO-u i emulzija sa 5% SP stabilizovana alkil-poliglukozidnim (APG) šećernim emulgatorom. Za određivanje minimalne inhibitorne koncentracije (MIK) korišćena je mikrodiluciona metoda u skladu sa preporukama Nacionalnog komiteta za standarde kliničkih laboratorija (2). Vankomicin je korišćen kao pozitivna, dok je DMSO bio negativna kontrola. Oba ispitivana uzorka su pokazala antimikrobnu aktivnost prema *C. acnes* (ATCC 6919). Vrednosti MIK su bile 1.56 mg/g za 5% rastvor SP i 0.078 mg/g za emulziju sa 5% SP. Ovi rezultati su pokazali da je antimikrobna aktivnost SP bolja nakon inkorporacije u emulziju, ukazujući da APG emulziona podloga utiče na antimikrobnu aktivnost SP. DMSO je pokazao slabu aktivnost protiv testiranog bakterijskog soja. Sa druge strane, antibiotski lek vankomicin je ispoljio značajno veću antimikrobnu aktivnost od SP, kao što se i očekivalo. SP je sam po sebi, kao i nakon inkorporiranja u APG emulzionu podlogu pokazao zadovoljavajuću antimikrobnu aktivnost protiv *C. acnes*, što baca novo svetlo na upotrebu SP u terapiji akni, naročito u kontekstu lokalnog lečenja ove česte kožne patologije.

### Literatura

1. D.Ilić, M.Cvetković, M.Tasić-Kostov. Emulsions with alkyl polyglucosides as carriers for off-label topical spironolactone – safety and stability evaluation. *Pharm. Dev. Technol.* 2021; 26:3, 373-379.
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