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ANALYSIS OF RESTRICTED ANTIBIOTICS' IMPLEMENTATION IN CLINICAL CENTER OF MONTENEGRO DURING 2019. AND THE IMPACT OF COVID-19 EPIDEMIC ON THEIR USAGE

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Restricted antibiotics include the ones that are not used as first-line antibiotics, for they are preserved for treating infections that cannot be cured with common antibiotics. In 2016, Clinical center of Montenegro filed a restriction on implementation of amikacin, tobramycin, ceftazidime, cefotaxime, cefixime, cefepime, colistin, linezolid, moxifloxacin, ofloxacin, levofloxacin, meropenem, imipenem/cilastatin, ertapenem, piperacillin/tazobactam, tigecycline, vancomycin and teicoplanin. The goal of this research is analysis of restricted antibiotics' implementation during 2019. and their usage during the COVID-19 epidemic. 174 requests for restricted antibiotics from 2019. and the usage of restricted antibiotics during the COVID-19 pandemic were retrospectively analyzed. By data analysis it was determined that the antibiogram has been done only in 21,84% of cases. In 72.25% of cases restricted antibiotic was included in therapy without prior antimicrobial therapy using unrestricted antibiotic. Monotherapy was included in the largest number of cases (75,28%), two antibiotics were used in 19,54% of cases, combination of three in 4,02% of cases, and there were 1,15% of cases of using 4 restricted antibiotics in therapy. The average therapy duration was 8.84 days, though there was a large range of shortest (3 days) and longest (40 days) therapy duration. Most commonly used antibiotics were meropenem (53 cases – 30,45%), amikacin (36 cases – 20,68%), vancomycin (33 cases – 18,7%). The combination of imipenem and cilastatin was used in 13 cases (7,47%). Most commonly isolated causative agents were *Acinetobacter spp.* (8), *Pseudomonas aeruginosa* (8), *Staphylococcus aureus* (6) and *Clostridium difficile* (4). Usage of restricted antibiotics has increased during COVID-19 (2021) – usage of amikacin has risen 1,5 times more than in 2019, ceftazidime 2,3 times, cefixime 1,6, meropenem 2,3, piperacillin/tazobactam 2,57 and vancomycin 1,63 times.The increase of restricted antibiotics' usage during COVID-19 could highly negatively affect rational antibiotic use implementation, as well as the antimicrobial resistance.

ANALIZA PRIMJENE REZERVNIH ANTIBIOTIKA U KLINIČKOM CENTRU CRNE GORE TOKOM 2019. GODINE I UTICAJ EPIDEMIJE COVID-19 NA NJIHOVU POTROŠNJU

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Koncept rezervnih antibiotika podrazumijeva usvajanje liste antibiotika koji se ne koriste kao ljekovi prvog izbora, već se čuvaju za infekcije koje ne reaguju na antibiotike prvog izbora. U Kliničkom centru Crne Gore je 2016. godine uvedena restrikcija u propisivanju amikacina, tobramicina, ceftazidima, cefotaksima, cefiksima, cefepima, kolistina, linezolida, moksifloksacina, ofloksacina, levofloksacina, meropenema, imipenem/cilastatina, ertapenema, piperacilin/tazobaktama, tigeciklina, vankomicina i teikoplanina. Cilj istraživanja je analiza primjene rezervnih antibiotika tokom 2019. godine i njihove potrošnje tokom epidemije COVID-19.Retrospektivno su analizirana 174 zahtjeva za izdavanje rezervnih antibiotika iz 2019. godine i potrošnja rezervnih antibiotika tokom epidemije COVID-19. Analizom je utvrđeno da je antibiogram rađen u 21,84% slučajeva (38). U 72,25% slučajeva rezervni antibiotik je uključen u terapiju bez prethodne terapije nerezervnim antibiotikom. U 75,28% analiziranih slučajeva korišćen je jedan rezervni antibiotik, u 19,54% slučajeva korišćena su dva, u 4,02% slučajeva tri, a u 1,15% slučajeva su u terapiji bila zastupljena četiri rezervna antibiotika. Prosječna dužina trajanja terapije bila je 8,84 dana, sa velikim rasponom između minimalne (3 dana) i maksimalne dužine trajanja (40 dana). Najčešće su korišćeni meropenem (30,45%), amikacin (20,68%) i vankomicin (18,7%). Najčešće su izolovani *Acinetobacter spp*. (8), *Pseudomonas aeruginosa* (8), *Staphylococcus aureus* (6) i *Clostridium difficile* (4). Potrošnja rezervnih antibiotika tokom epidemije COVID-19 (2021. god.) u odnosu na 2019. godinu bila je povećana – potrošnja amikacina je bila veća 1,5 puta, ceftazidima 2,3, cefiksima 1,6, meropenema 2,3, piperacilin/tazobaktama 2,57, a vankomicina 1,63 puta. Povećanje potrošnje rezervnih antibiotika tokom epidemije COVID-19 može negativno uticati na mogućnost implementacije principa racionalne primjene antibiotika i pojavu antimikrobne rezistencije.