

# Efektivitas penggunaan kombinasi hidroksiapatit dan gentamisin pada penyembuhan osteomyelitis kronis tulang tibia pada model kelinci = Effectivity of the combination of hydroxyapatite and gentamicin in the healing of tibial chronic osteomyelitis in rabbit model

Yanto, author

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## Abstrak

[<b>ABSTRAK</b><br>

Pendahuluan: Tatalaksana osteomyelitis dengan debridement, guttering, pemberian antibiotika sistemik sering tidak mencapai hasil yang memuaskan dikarenakan antibiotik tidak dapat mencapai lokasi infeksi dengan baik. Cara lain dengan pemberian antibiotik lokal untuk mencapai lokasi infeksi dalam bentuk beads dinilai tidak efektif karena memerlukan 2 kali operasi. Kombinasi antibiotik lokal dengan scaffolding berupa hidroksiapatite (HA) porous yang dapat diserap dan pembawa antibiotik belum pernah diteliti.

Metode penelitian: Dilakukan uji pre test post test kelompok kontrol pada model kelinci osteomyelitis. Sepuluh ekor kelinci New Zealand digunakan dengan berat 2.500-3500 gr yang dibagi kedalam 2 kelompok yaitu kelompok kontrol dan kelompok perlakuan (n=5). Dilakukan penyuntikan bakteri pada tulang tibia kelinci, setelah terbentuk model osteomyelitis kemudian dilakukan perlakuan. Untuk kelompok kontrol dilakukan debridement dan diberikan injeksi antibiotik ceftriaxon selama 4 minggu dan kelompok perlakuan dilakukan debridement, diberikan kombinasi HA dan Gentamisin serta injeksi antibiotik ceftriaxon selama 4 minggu. Setelahnya dilakukan penilaian klinis, x- ray, kultur dan histopatologis.

Temuan dan Diskusi: Secara radiologis ditemukan perbaikan skor penebalan kortek tibia pada kelompok perlakuan dibanding kelompok kontrol (p=0,48), begitu juga pada Histopatological osteomyelitis evaluation score (p=0,009). Secara klinis terdapat perbaikan skor pembengkakan pada semua (n=5) kelompok perlakuan dibanding dengan kelompok kontrol, namun secara statistik tidak bermakna (p=0,053). Sementara pada penilaian kultur tidak ditemukan perbedaan bermakna antar kedua kelompok (p=1,00)

Kesimpulan: Kombinasi Hydroxyapaptite porous dan gentamisin sebagai antibiotik lokal pada pengobatan model osteomyelitis tibia kelinci memberikan perbaikan skor radiologis, histopatologis dan perbaikan klinis dibanding dengan prosedur standar pengobatan oseomyelitis kronis yang sudah ada.

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<b>ABSTRACT</b><br>

Introduction. Treatment of osteomyelitis with debridement, guttering, systemic antibiotics often do not achieve satisfactory results due to the antibiotic can not reach the infection site. Another way of local antibiotic delivery to reach the site of infection in the form of beads is considered ineffective because it requires two separate surgeries. Local antibiotic combined with scaffold in the form of porous hidroxyapatite that can be absorbed and antibiotics cariere have not been studied.

Methods. We conducted pretest and posttest control group in a rabbit model of osteomyelitis. Ten rabbits divided in control group and the treatment group (n=5). We injected Staphylococcus aureus in the rabbit tibia, forming the osteomyelitis model, and then performed treatment for osteomyelitis. In the control group, we performed debridement and gave ceftriaxone injection for 4 weeks. Whereas in the treatment group, we

add the combination of porous hydroxyapatite and Gentamicin. Afterwards, we did clinical assessment, x-ray, culture, and histopathology.

Results and discussion. Radiologically, tibia cortical thickening scores improved in the treatment group compared to the control group ( $p=0.48$ ) as well as histopathological osteomyelitis evaluation score ( $p=0,009$ ). Clinically, there were improvements in the swelling scores ( $n=5$ ) of the treatment group compared to control group, but no significant statistically ( $p=0.053$ ). In culture, there were no significant difference between the two groups ( $p=1.00$ ).

Conclusion. Combination of porous hydroxyapatite and gentamycin as a local treatment of osteomyelitis of the rabbit tibial osteomyelitis models improved radiological and histopathological scores and also clinically compared to existing standard treatment procedures for chronic osteomyelitis., Introduction. Treatment of osteomyelitis with debridement, guttering, systemic antibiotics often do not achieve satisfactory results due to the antibiotic can not reach the infection site. Another way of local antibiotic delivery to reach the site of infection in the form of beads is considered ineffective because it requires two separate surgeries. Local antibiotic combined with scaffold in the form of porous hydroxyapatite that can be absorbed and antibiotics carriers have not been studied.

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