

Pengaruh Pemberian Kombinasi Aspirin dan Kalsium terhadap Jumlah Sel Osteoklas pada Tulang Tibia Tikus Ovariectomi = The Effect of Combination of Aspirin and Calcium on the Number of Osteoclast Cells in the Tibia Bone of Ovariectomized

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Abstrak

Osteoporosis adalah penyakit tulang yang ditandai dengan rendahnya massa tulang yang menyebabkan peningkatan risiko patah tulang. Pada penelitian sebelumnya menunjukkan bahwa aspirin dapat mengurangi kadar S1P (Sphingosine-1-Phosphate) sehingga resorpsi tulang akibat osteoklas dapat menurun. Kombinasi aspirin dan kalsium digunakan dalam penelitian ini untuk melihat pengaruhnya terhadap jumlah sel osteoklas. Penelitian ini dilakukan pada tikus putih betina Sprague-Dawley yang dibagi menjadi 8 kelompok yaitu kelompok sham dan kontrol negatif yang diberikan CMC Na 0,5%, kelompok kontrol positif yang diberikan tamoksifen 3,6 mg/200 gBB/hari, kelompok aspirin yang diberikan aspirin 5,4 mg/200gBB/hari, kelompok kalsium yang diberikan kalsium 15 mg/200 g BB/hari, serta kelompok kombinasi aspirin dan kalsium dengan masing-masing dosisnya yaitu D1 aspirin 1,8 mg/200 g BB/hari dan kalsium 15 mg/200gBB/hari; D2 aspirin 5,4 mg/200gBB/hari dan kalsium 15 mg/200gBB/hari; dan D3 aspirin 16,2 mg/200gBB/hari dan kalsium 15 mg/200gBB/hari secara peroral. Sebelum pemberian obat, semua tikus dibedah ovariektomi kecuali kelompok sham dan kontrol negatif yang dibedah sham. Setelah pembedahan, tikus dipelihara selama 28 hari kemudian diberikan obat. Parameter yang diukur adalah berat tulang tibia dan jumlah sel osteoklas yang dilihat secara histopatologi dengan pewarnaan HE (Hematoksilin-Eosin). Berat tulang tibia kelompok sham 321,90±10,39mg, kontrol negatif 272,30±54,18mg, kontrol positif 312,50±40,86mg, aspirin 336,67±29,57mg, kalsium 335,90±60,66mg, D1 346,27±83,91mg, D2 377,00±4,51mg, D3 366,67±48,52mg. Jumlah sel osteoklas kelompok sham 7,8±0,4sel/lapang pandang, kontrol negatif 9,13±1,10sel/lapang pandang, kontrol positif 8,13±1,67sel/lapang pandang, aspirin 7,53±1,52sel/lapang pandang, kalsium 7,67±0,64sel/lapang pandang, D1 7,47±0,31sel/lapang pandang, D2 5,33±0,99sel/lapang pandang, D3 7,67±0,31sel/lapang pandang. Hasil ini menunjukkan bahwa aspirin dan kalsium dapat meningkatkan berat tulang dan menurunkan jumlah sel osteoklas.

.....Osteoporosis is a bone disease characterized by low bone mass which causes an increased risk of fracture. Previous study have shown that aspirin can reduce S1P (Sphingosine-1-Phosphate) levels so that bone resorption due to osteoclasts can decrease. The combination of aspirin and calcium was used in this study to see its effect on the number of osteoclasts. This study was conducted on female white Sprague-Dawley rats which were divided into 8 groups, sham, negative control groups were given 0.5% CMC Na, positive control group was given tamoxifen 3.6 mg/200gBW/day, aspirin group was given 5.4 mg/200gBW/day, calcium group was given calcium 15 mg/200gBW/day, and the aspirin and calcium combination group with each dose of D1 aspirin 1.8 mg/200gBW/day and calcium 15 mg/200gBW/day, D2 aspirin 5.4 mg/200gBW/day and calcium 15 mg/200gBW/day, and D3 aspirin 16.2 mg/200gBW/day and calcium 15 mg/200gBW/day orally. All rats were ovariectomized except for the normal group and the negative control group which underwent sham surgery. The rats were kept for 28 days and then given the drug. The parameters measured were the weight of the tibia bone and the number of osteoclasts seen

histopathologically with HE (Hematoxylin-Eosin) staining. Weight of tibia bone are 321.90 ± 10.39 mg for sham, 272.30 ± 54.18 mg for negative control, 312.50 ± 40.86 mg for positive control, 336.67 ± 29.57 mg for aspirin, 335.90 ± 60.66 mg for calcium, 346.27 ± 83.91 mg for D1, 377.00 ± 4.51 mg for D2, 366.67 ± 48.52 mg for D3. The number of osteoclasts in cells/field of view are 7.8 ± 0.4 for sham, 9.13 ± 1.10 for negative control, 8.13 ± 1.67 for positive control, 7.53 ± 1.52 for aspirin, 7.67 ± 0.64 for calcium, 7.47 ± 0.31 for D1, 5.33 ± 0.99 for D2, 7.67 ± 0.31 for D3. The result is the combination of aspirin and calcium can increase bone weight and decrease the number of osteoclasts.