PENGARUH LARUTAN NIKOTIN TERHADAP PENINGKATAN KADAR OSTEOCALCIN SERUM PADA TIKUS MODEL OSTEOPOROSIS

TUGAS AKHIR

Untuk Memenuhi Persyaratan Memperoleh Gelar Sarjana Kedokteran

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ABSTRAK


Osteoporosis merupakan penyakit degeneratif yang terjadi karena berkurangnya kepadatan massa tulang dan dapat meningkatkan resiko terjadinya patah tulang. Osteoporosis terjadi akibat penurunan proses pembentukan tulang dan peningkatan resorpsi tulang. Osteocalcin adalah protein non-kolagen dari matriks tulang yang diproduksi oleh osteoblas selama pembentukan tulang pada fase remodeling. Nikotin merupakan senyawa alkaloid yang dapat menstimulasi nAChR (reseptor nicotinic acetylcholine) dan meningkatkan proliferasi osteoblast. Penelitian eksperimental ini menggunakan desain post-test only controlled group yang bertujuan untuk mengetahui pengaruh pemberian larutan nikotin terhadap kadar osteocalcin serum pada tikus Wistar model osteoporosis. Dua puluh lima tikus Wistar betina dibagi menjadi 5 kelompok, yaitu kelompok kontrol negatif, kelompok kontrol positif yang hanya dilakukan ovariektomi dan 3 kelompok perlakuan yang diovariektomi dan diberikan larutan nikotin dengan dosis berbeda. Kelompok perlakuan 1 diberi nikotin dengan dosis 0,25 mg/kgBB, kelompok perlakuan 2 dengan dosis nikotin 0,5 mg/kgBB, dan kelompok perlakuan 3 dengan dosis nikotin 0,75 mg/kgBB selama 25 hari. Pada hari ke-58, tikus dieuthanasia dan diambil sampel darah tikus. Pengukuran kadar osteocalcin dilakukan dengan menggunakan ELISA. Hasil analisis statistik, menunjukkan bahwa tidak terdapat peningkatan kadar osteocalcin dalam serum secara bermakna (p=0,459, uji One way ANOVA). Kesimpulan penelitian ini adalah bahwa pemberian larutan nikotin dengan dosis 0,25 mg/kgBB, 0,5 mg/kgBB, dan 0,75 mg/kgBB tidak memiliki pengaruh secara bermakna terhadap kadar osteocalcin serum pada tikus Wistar model osteoporosis.

Kata kunci: Osteoporosis, Osteoblas, Osteocalcin, Nikotin
ABSTRACT

Maulidya, Elli. 2017. The Effect of Nicotine Solution on Serum Osteocalcin Levels in Osteoporosis Rats Model. Final Assignment, Medical Program, Faculty of Medicine Brawijaya University. Supervisors: (1) dr. Panji Sananta, Sp.OT, M.Ked (2) dr. Asri Prameswari, Sp.PD.

Osteoporosis is a degenerative disease that occurs due to the decreased of bone mass density and may increase the risk of fractures. Osteoporosis is caused by decreased of bone formation and increased of bone resorption. Osteocalcin is non-collagenous protein in bone matrix that produced by osteoblast during bone formation in the remodeling phase. Nicotin is alkaloid compound that can stimulate nAChR (nicotinic acetylcholine receptor) and increase osteoblast proliferation. This experimental study used post-test only controlled group design that has objective to determine the effect of nicotine solution on serum osteocalcin levels in Osteoporosis models of Wistar rats. Twenty-five female Wistar rats divided into 5 groups, those groups were negative control, positive control that ovariectomized only, and 3 treatment group that ovariectomized and given nicotine solution with different doses. The first treatment group was given nicotin with dose 0,25 mg/kgBW , the second treatment group were given nicotin with dose 0,5 mg/kgBW, and the third treatment group were given nicotin with dose 0,75 mg/kgBW for 25 days. On the 58th day, the rats were euthanized, then blood sample was collected. Osteocalcin serum levels measured by using ELISA. Statistical analysis showed that there was no significant increase in serum osteocalcin levels (p=0.459, One way ANOVA test). The conclusion of this study is the administration of Nicotine solution in 0,25 mg/kgBW, 0,5 mg/kgBW, and 0,75 mg/kgBW dose has no significant effect on serum osteocalcin levels in Osteoporosis models of Wistar rats.

Keywords: Osteoporosis, Osteoblast, Osteocalcin, Nicotine