

INTISARI

Latar Belakang. Penelitian terkait pengembangan hewan model menggunakan neurotoksika telah banyak dilakukan. Namun, penggunaan neurotoksika yang lebih efektif untuk membuat model penyakit demensia Alzheimer belum diketahui. Hal ini yang menjadi alasan untuk mencari model yang sederhana dan tidak mahal yang merupakan salah satu model paling efektif untuk digunakan di antara banyaknya model demensia Alzheimer. Trimetiltin, skopolamin dan D-galaktosa merupakan jenis neurotoksika yang penggunaannya sederhana dibandingkan dengan jenis neurotoksika lainnya.

Tujuan Penelitian. Penelitian ini bertujuan untuk mengkaji dan membandingkan efek tiga jenis neurotoksika trimetiltin, skopolamin dan D-GalAl terhadap fungsi memori spasial dan jumlah sel pyramidal hippocampus.

Metode Penelitian. Tikus Wistar jantan dibagi dalam 4 kelompok yang terdiri dari kelompok C merupakan kontrol yang diberikan NaCl 0,9%, kelompok T diberikan trimetiltin (8 mg/kgBB) dengan dosis tunggal, kelompok S diberikan skopolamin (1 mg/kgBB) selama 14 hari, kelompok DA diberikan D-galaktosa (120 mg/kgBB) kombinasi AlCl₃ (40 mg/kgBB) selama 35 hari. Uji fungsi memori dilakukan menggunakan uji Y *maze*, selanjutnya dilakukan penghitungan jumlah sel pyramidal dengan analisis stereologi.

Hasil Penelitian. Pemberian neurotoksika trimetiltin menunjukkan jumlah sel pyramidal lebih sedikit pada regio CA1 tapi tidak pada regio CA2-CA3 dibandingkan dengan skopolamin dan D-galaktosa kombinasi AlCl₃. Hasil uji Y *maze* menunjukkan fungsi memori tidak ada perbedaan yang signifikan antara kelompok neurotoksika dan kontrol dan tidak ada hubungan antara jumlah sel pyramidal dengan memori spasial pada tikus yang diinduksi neurotoksika TMT, skopolamin dan D-galaktosa kombinasi AlCl₃.

Kesimpulan. Trimetiltin lebih signifikan menginduksi model demensia Alzheimer khususnya pada penurunan jumlah sel pyramidal dibandingkan skopolamin dan D-galaktosa kombinasi AlCl₃ gagal menginduksi model demensia Alzheimer serta tidak ditemukan hubungan antara jumlah sel pyramidal hippocampus pada tikus yang diinduksi neurotoksika TMT, skopolamin, D-galaktosa kombinasi AlCl₃.

Kata kunci: hewan model, penyakit Alzheimer, memori spasial, sel pyramidal.

ABSTRACT

THE EFFECTS OF TRIMETHYLTIN, SCOPOLAMINE, D-GALAKTOSA AND ALUMINUM CHLORIDE (AICI₃) NEUROTOXIC ON SPATIAL MEMORY AND NUMBER OF HIPPOCAMPUS PYRAMIDAL CELLS ON WISTAR RATS

Ayu Anggraini¹, Ginus Partadiredja², Zaenal Muttaqien Sofro²

1 A Graduate Student of Master of Biomedical Science of Physiology Major
Interests Faculty of Medicine, Public Health and Nursing
Universitas Gadjah Mada

2 Department of Physiology Faculty of Medicine, Public Health and Nursing
Universitas Gadjah Mada

Background. Research on the development of model animals using neurotoxicity has been widely used. However, no single neurotoxicity has been known to be effective in inducing a model of Alzheimer's dementia disease. This is the reason for finding a simpler and less expensive model that is the one of most effective models to use among the many models of Alzheimer's dementia. Trimethyltin, scopolamine and D-galactose as a type of neurotoxic which is simple compared to other types of neurotoxins.

Research purposes. This study aims to examine and compare the effects of three types of neurotoxicity agents. They are trimethyltin, scopolamine and DGalAl to spatial memory function and the number of pyramidal hippocampus cells.

Research methods. Male Wistar rats were divided into four groups, consisted of group C as control group received 0.9% NaCl, group T received trimethyltin (8 mg/kgBB) with a single dose, group S received scopolamine (1 mg/kgBB) for 14 days, group DA received D-galactose (120 mg/kgBB) combined with AICI₃ (40 mg / kgBB) for 35 days. The memory function test was performed to soften the Y-maze test, and then to calculate the pyramidal cell by stereological analysis.

Research result. Trimethyltin neurotoxicity showed fewer pyramidal cells in the CA1 region, but not in the CA2-CA3 region compared with scopolamine and D-galactose combined with AICI₃. Y-maze test results showed memory function in which there was no significant difference between the neurotoxic and control groups, and no association between pyramidal cell count and spatial memory in TMT induced neurotoxic rats, scopolamine and D-galactose combinations of AICI₃

Conclusion Trimethyltin significantly induces the model of Alzheimer's dementia, especially in the reduction of pyramidal cell counts versus scopolamine and D-galactose combined with AICI₃ fails to induce the Alzheimer's dementia model and no association was found between the number of pyramidal hippocampal cells in TMT-induced neurotoxic rats, scopolamines, D-galactose combinations of AICI₃.

Keywords: model animal, Alzheimer's disease, spatial memory, pyramidal cells.