

INTISARI

Latar Belakang. Pengembangan model hewan coba demensia Alzheimer yang diinduksi neurotoksika telah banyak dilakukan dengan menggunakan berbagai macam zat kimiawi. Tidak ada satupun model yang ideal, memberikan suatu pertimbangan untuk mencari model demensia yang lebih efektif, sederhana dan tidak mahal di antara beberapa jenis model demensia yang ada yaitu trimetiltin (TMT), skopolamin dan Dgalaktosa- AlCl_3 (DGalAl) yang relatif tidak invasif dibandingkan streptozotosin, kolkisin, peptida $\text{A}\beta$, *okadaic acid* dan lainnya.

Tujuan Penelitian. Penelitian ini bertujuan untuk mengkaji dan membandingkan efek tiga jenis neurotoksin TMT, skopolamin dan DGalAl terhadap fungsi memori spasial dan kadar enzim antioksidan pada hippocampus.

Metode Penelitian. Tikus dikelompokkan menjadi 4 kelompok, yaitu kelompok I merupakan kontrol yang diberikan NaCl 0,9 %; kelompok II, yang diberikan TMT (8 mg/kgBB); kelompok III, yang diberikan skopolamin (1 mg/KgBB) selama 14 hari dan kelompok IV, yang diberikan kombinasi D-galaktosa (120 mg/KgBB) dan AlCl_3 (40 mg/KgBB) selama 35 hari. Penilaian memori spasial dengan uji *Morris water maze* setelah perlakuan dilanjutkan dengan mengukur kadar enzim antioksidan SOD, GPx dan katalase.

Hasil Penelitian. Pemberian ketiga jenis neurotoksika, TMT dosis tunggal pada hari ke-21 dan skopolamin pada hari ke-7 memberikan gambaran gangguan memori spasial, tetapi tidak tampak pada kelompok yang diberikan D-galaktosa/ AlCl_3 . Kelompok TMT menunjukkan gambaran gangguan fungsi pembelajaran pada sebagian besar latihan (fase *escape acquisition*) dan proses memori (fase *probe trial*), sedangkan kelompok skopolamin pada sebagian kecil latihan (fase *escape acquisition*) dan tidak terlihat pada fase *probe trial*. Kadar antioksidan SOD, GPx dan katalase tidak ada perbedaan yang signifikan antara kelompok neurotoksika dengan kontrol.

Kesimpulan. TMT lebih signifikan dalam menginduksi hewan model demensia Alzheimer dibandingkan neurotoksika skopolamin, namun pemberian D-galaktosa- AlCl_3 gagal menginduksi model demensia.

Kata kunci: hewan model, penyakit Alzheimer, memori spasial, enzim antioksidan.

ABSTRACT

Background: Neurotoxicant-induced experimental animal had been widely used to develop animal model of Alzheimer's dementia. As no single ideal model exist, a more effective, simple, and inexpensive dementia model is an ideal and worthy model to consider among some of dementia models that are relatively noninvasive such as trimethyltin, scopolamine and Dgalactose- AlCl_3 .

Objective: This study aimed to investigate and compare the effects of three types of neurotoxins trimethyltin, scopolamine, D-Galactose- AlCl_3 on spatial memory function and oxidative stress in the hippocampus.

Methods: Wistar rats were grouped into 4 groups, ie group I was the control group treated with NaCl 0.9%; group II, treated with trimethyltin (single dose of 8 mg/kgbw); group III, treated with scopolamine (1 mg/kgbw) for 14 days and group IV, treated with a combination of D-Galactose (120 mg/kgbw) and AlCl_3 (40 mg/kgbw) for 35 days. Spatial memory assessment with MWM test after treatment was continued with assessing the status of oxidative stress of the hippocampus by measured the levels of the antioxidant enzymes SOD, GPx and catalase.

Results: The administration of three types neurotoxicant, single dose of TMT on day 21 and scopolamine on day 7 showed a significant decline on spatial memory, but not seen in group treated with D-Galactose- AlCl_3 . A disruption on the learning function occurred in most of the test (escape acquisition phase) and memory process (probe trial phase) shown in TMT group, while only in a small part of the test (escape acquisition phase) and was not seen in the probe trial phase in scopolamine group. The levels of three antioxidant indicated the status of oxidative stress were not significantly different between neurotoxicant groups and control group.

Conclusion: TMT was more significantly induced Alzheimer dementia-like model than scopolamine, but administration of D-Galactose- AlCl_3 failed to induced animal model with dementia.

Keywords: animal model, Alzheimer's disease, spatial memory, antioxidant enzyme