

ABSTRACT

Glutamate is a main component of Monosodium Glutamate (MSG). It is excitatory neurotransmitter but it leads to excitotoxicity in brain nerve cells when consumed in large doses. It also has negative impact in learning ability and memory. The aim of this study is to determine exercise effect in protecting learning ability and memory caused by MSG exposure.

This study using experimental laboratories with pretest-posttest control group design. Thirty mice males were tested for learning ability and memory using Morris Water Maze before and after treatment. They were divided into three groups, they are one control group/K (without treatment) and two treatment group were given different treatment for 21 days. Group P1 was given 2,5 mg/gBW MSG intraperitoneal injection, group P2 was given 2,5 mg/gBW MSG intraperitoneal injection and swimming exercise with a span of 30 minutes/day on 5 days/week for 3 weeks with a load individual 4% of body weight.

The result showed latency time (LT) and frequency (F) between pretest and posttest group K increased significantly (LT: pretest $11,80 \pm 2,00$; posttest $14,68 \pm 2,65$; $p=0,048$ and F: pretest $1,44 \pm 1,13$; posttest $3 \pm 1,32$; $p=0,028$). In group P2, there was a significant difference of latency time (LT: pretest $11,61 \pm 4,60$; posttest $14,97 \pm 4,87$; $p=0,010$) but no significant difference of frequency (F: pretest $2,44 \pm 2,35$; posttest $2,89 \pm 2,03$; posttest $13,2 \pm 4,16$; $p=0,645$). And in group P1 there was no significant difference of latency time and frequency (LT: pretest $12,62 \pm 2,73$; posttest $13,20 \pm 4,16$; $p=0,559$ and F: pretest $1,5 \pm 0,76$; posttest $1,5 \pm 1,77$; $p=1,000$). Our study suggested that exercise (swimming) with a span of 30 minutes/day on 5 days/week for 3 weeks with a load of 4% body weight can protect learning ability but not memory caused by MSG exposure.

Keywords: *Monosodium glutamate, exercise, learning ability, memory*