

***ABSTRACT***

**THE EFFECT OF PHYSICAL EXERCISE DURING CHRONIC  
NICOTINE EXPOSURE TO NICOTINE WITHDRAWAL  
SYMPTOMS IN MICE**

**Diah Ayu Retanti**

Nicotine is a substance in tobacco inducing addiction. Chronic use of nicotine can cause desensitization of nAChRs, decrease serotonin release, and decrease neuronal firing on VTA. The mechanism of nicotine withdrawal is a decrease in the stimulation of nAChRs so that reducing brain reward function. This condition results in nicotine withdrawal symptoms. Negative effects of nicotine withdrawal can be suppressed by giving physical exercise. Physical exercise increases neurogenesis of hippocampus which plays a role in learning, memory, stimulate cell, and reduce the somatic signs.

This research aimed to investigate the effect of physical exercise during chronic nicotine exposure to nicotine withdrawal symptoms in mice, based on anxiety behavior and somatic signs. There were five groups of male balb/C strains mice. Physical exercise was given for an hour with three times breaks every day. Chronic nicotine exposure was given by the subcutaneous repeated injection of 1,0 mg/kg BW nicotine three times a day, for consecutive 10 days.

The level of anxiety was measured using the elevated plus maze method. Statistical analysis of anxiety showed a significant decrease in physical exercise during nicotine exposure group ( $p=0,0017$ ) in open arm time spent. Somatic signs were observed for 30 minutes with mice inserted into a plastic chamber. Statistical analysis of total somatic signs showed a significant difference between mecamylamine precipitated withdrawal and physical exercise group not only during nicotine exposure ( $p=0,0073$ ) but also before and during nicotine exposure ( $p=0,0177$ ). It can be concluded that the presence of physical exercise reduced nicotine withdrawal symptoms based on somatic signs but induced anxiety-like behavior.

**Keywords:** Anxiety, nicotine, nicotine withdrawal, physical exercise, somatic signs.