

ABSTRACT

THE EFFECT OF CHRONIC ELECTROMAGNETICS WAVE EXPOSURES TO WORKING MEMORY AND BEHAVIORAL CHANGES IN WHITE RATS (*Rattus norvegicus*) *Sprague dawley* STRAIN

BY

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The high rate of mobile phone use in the community will increase the exposure to electromagnetic waves. Exposure to electromagnetic waves can increase the activity of oxidation and free radicals that can alter the body's physiology. This is due to the presence of reactive oxygen species (ROS) and the induction of oxidative stress that has an effect on cell damage, especially in brain tissue. The stress induction also affect on memory, chronic stress will cause a deficit in working memory which indicates damage on the hippocampus. Damage to the hippocampus as a result of chronic stress can also can lead to changes in behavior. The purpose of this study is to determine the effect of mobile phone electromagnetic exposure to working memory and sucrose intake. The sample of this research are 18 rats (*Rattus norvegicus*) 2-3 week-old *Sprague dawley* strain were divided into 3 different groups: control group (K), 1 hour exposure per day group (P1) and 3 hours exposure per day (P2) which exposed to mobile phone's electromagnetic waves for 21 days. Pre-test and post-test of working memory are done with Radial Arm Maze. Pre-test was performed 1 day before treatment and post-test performed on the day 22. Sucrose intake measurements performed daily until day 21 of exposure. The average values of working memory's pre-test are K:3,83%, P1:3,67%, P2:3,83% and for the post-test are K:1,83%, P1:1,67%, P2:1,33% with Wilcoxon bivariate analysis test in K $p=0,026$, P1 $p=0,026$, P2 $p=0,026$ ($p < 0,05$). The average of sucrose intake are K:181,19ml, P1:159,05ml, P2:171,19ml with $p=0,311$ ($p > 0,05$) in Kruskal-Wallis bivariate analysis test. Chronic exposure to phone's electromagnetic waves for 21 days impressed the working memory and not affected sucrose intake in rats (*Rattus norvegicus*).

Keywords: electromagnetic waves, mobile phones, sucrose intake, working memory, reactive oxygen species.