

## The Influence of Aerobic Physical Exercise with Different Frequency to Concentration of Vascular Endothelial Growth Factor in Brain Tissue of Wistar Rat

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**Abstract :** Background: Aerobic physical exercises are recommended to keep body fit and healthy although physical exercises themselves can increase body metabolism and oxygen and can lead into tissue hypoxia. Oxygen pressure can serve as Vascular Endothelial Growth Factor (VEGF) regulator. Hypoxia increases gene expression of VEGF through ascendant regulation of HIF-1. VEGF is involved in regulating angiogenesis process. Aerobic physical exercises can increase the concentration of VEGF in brain and enables angiogenesis process. We have investigated the influence of aerobic physical exercise to the VEGF concentration of wistar rat's brain. Methods: This was experimental study using post test only control group design. Independent t-test was used as statistical test. The samples were twenty four wistar rat (*Rattus Norvegicus*) which were divided into four groups: group P1 (control group), group P2 (treatment group with once-a-week exercise), group P3 (treatment group with three time-a-week exercise), and group P4 (treatment group with seven time-a-week exercise). Group P2, P3, and P4 were treated with treadmill with speed of 20 m/minute for 30 minutes. The concentration of VEGF was determined by ELISA. Results: There was a significant increase of VEGF in treatment group compared with control one ( $<0.05$ ). The maximum increase was found in group P2 ( $129.02 \pm 64.49$ ) and the minimum increase was in group P4 ( $96.98 \pm 11.20$ ). Conclusion: The frequency of aerobic physical exercises influenced the concentration of Vascular Endothelial Growth Factor (VEGF) of brain tissue of *Rattus Norvegicus*.

**Keywords :** brain tissue, hypoxia, physical exercises, vascular endothelial growth factor

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