

Effect of Sleep Deprivation on the Number of Prefrontal Cortex Neuroglia Cells in Male White Rats (*Rattus norvegicus*)

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| Title | Effect of Sleep Deprivation on the Number of Prefrontal Cortex Neuroglia Cells in Male White Rats (<i>Rattus norvegicus</i>) |
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| Abstract | <p>Stress induced by sleep deprivation can increase inflammation and oxidative stress, destroying the pyramidal and neuroglia cells in the prefrontal cerebral cortex and interrupting cognitive and behavioral functions. This study aims to observe the difference in the number of pyramidal and neuroglia cells in the prefrontal cortex of male white rats (<i>Rattus norvegicus</i>) after stress induction by paradoxical sleep deprivation (PSD) and total sleep deprivation (TSD). This study was conducted in the Anatomy Laboratory of the Faculty of Medicine, Universitas Jenderal Soedirman, from November 2019 to February 2020. The method of this study was a posttest-only design with a control group approach using ten rats for each group; that was control (K.I.), PSD (K.II), and TSD (K.II). PSD and TSD groups received sleep deprivation treatment for eight days for 20 hours/day and 24 hours/day, respectively. The mean pyramidal cell number decreased in the PSD (66.67 ± 24.55) and TSD (65.90 ± 34.91) compared to the control (77.10 ± 26.11) group, but no significant differences were found between all groups ($p > 0.05$). The mean neuroglial cell number was lower in the PSD (97.78 ± 28.17) and TSD (75.80 ± 22.39) compared to the control (126.00 ± 48.81). Post-hoc Bonferroni test showed a significant difference between control and TSD ($p < 0.05$) but not between control and PSD or PSD and TSD ($p > 0.05$). In conclusion, there was a significant difference in the number of neuroglial cells but not pyramidal cells in the prefrontal cortex of male white rats (<i>Rattus norvegicus</i>) after stress induction with total sleep deprivation (TSD).</p> |
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