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Brain Stem and Cerebral Cortex Histamine Concentrations in the Rem Sleep Deprived Rats

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Abstract: Histamine is a biogenic amine widely distributed in the central nervous system that acts in a neuroregulatory role in controlling the waking state. The aim of this study was to determine whether 120 h of REM sleep deprivation (REMSD) causes changes in histamine concentrations in rat brain stems and cerebral cortex areas that are involved in the homeostatic regulation of sleep. A number of rats were subjected to 120 h of REM sleep deprivation using the flower pot water tank technique. This method used to induce REMSD is believed to be stressful. To control for the stress caused by the water environment, a tank control group (K II) was included, in which the animals could reside comfortably on a large platform in the water tank. The rats were divided into three groups: 1- The REMSD group resided in a water tank for 120 h (RD), 2- The tank control group resided in the water tank on a large platform for 120 h (K II), 3- The cage controls remained in their home cages for the entire duration of the study (K I). The brains were examined for histamine in the brain stem and cerebral cortex by the fluorometric method. The data was analysed through the Mann-Whitney U test. Histamine concentrations were significantly increased in the brain stem of the RD and K II groups compared to K I group rats. These results suggest that an increase in brain stem histamine levels was associated with increased histaminergic neuron activity in rats exposed to the water tank treatment for 120 h.

Key Words: REM sleep, deprivation, histamine, brain stem, cerebral cortex

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