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NERVOUS SYSTEM INTERACTION WITH ALTERED GRAVITY

Abstract

Colonizing the space involves not only sufficient resources so that a community of people would be able to live in an extra-terrestrial area, but also testing the capability of inhabitants to adapt to new conditions.

During the past decades, scientists tried to understand the ability of a human body to acclimate in space, especially testing its accommodation to no gravity. From immediate reactions caused by the nonexistence of atmospheric pressure to long lasting issues such as osteoporosis, everything that disturbs the structure of the physique was studied and later proved in experiments. Little is actually known about the change of the nervous system provoked by such conditions, besides theoretical aspects or investigations conducted on flies and frogs (merely similar to humans).

This article has the aim of showing hypothetical results on research conducted on the alteration of the nervous system in low gravity. The paper will present a considerate comparison between the activity of the nervous system in normal gravity (1g) and the motion of it in spatial conditions. The final theoretical conclusions could be future hypothesis for upcoming expeditions on extra-terrestrial ground. The core concept of the paper is to find whether the reflex is a faster phenomenon in 1g or in no gravity. Many factors were taken into consideration for this individual research, such as: membrane parameters, ion channel parameters, electrophysiological properties of single cells and parameters for action potential. Besides this, other relevant aspects that influence the final outcome is the action of endocrine system in space, more exactly how is it influenced by stress and how it can slow down or speed up the secretion of glands. Another area that influences the motion of this system is the race factor, as there are numerous organs that have developed in a different way depending on the race (the anterior cingulate cortex, the dorsolateral prefrontal cortex, the amygdala, etc.), most of them being more operational because of stress suffered by a race due to multiple causes. The last important feature that must be pondered, as it affects the organs by amending them, are the well-known issues provoked by the absence of atmospheric pressure, the objective being to determine exactly how these events affect the nervous system.

This innovative research provides countless factors that must be taken into consideration so that the theoretical aspects will look similar to the forthcoming real research that could be conducted in space.