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STUDY OF THE ALTERATIONS PRODUCED IN THE FUNCTIONAL AND STRUCTURAL ORGANIZATION OF BRAIN CONNECTIVITY DURING SPACE FLIGHT.

Abstract

Currently, progress has been made in the preparation of interplanetary space missions to send astronauts to the Moon. Maintaining astronauts' health during and after space flight to facilitate their recovery upon arrival on Earth is one of the current objectives that will improve the quality of longer space missions.

The most significant challenges for astronauts are caused by microgravity; as body weightlessness and supportive unloading result in hypokinesia, vestibular sensory deprivation and altered central interpretation of vestibular input (Young et al., 1984), as well as fluid redistribution (Smith et al., 1997). Thus, the human brain undergoes alterations related to intracranial pressure, causing the triggering of multiple pathologies.

This review provides an overview of the development of orbital and intracranial effects generated by microgravity.

It also presents a research proposal focused on the analysis of cerebrospinal fluid (CSF) during intracranial pressure and the regulatory processes of possible functional and structural changes in synaptic integrity, neuronal function and brain volume, induced by the environmental conditions of space missions, to determine the alterations produced in the functional and structural organization of brain connectivity during spaceflight, and to identify diagnostic biomarkers that allow us to design targeted therapeutic strategies for the aforementioned neuronal alterations.