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MELOXICAM EFFECT ON PLANARIANS IN A LOW MAGNETIC FIELD SPACE ANALOG

Abstract

Pain relief medications are commonly used by astronauts in space and NSAIDs are the first treatment option. In the present investigation, planarians are used as an animal model, to study their locomotion and behavioural changes (gliding/scrunching/other) when pre-incubated in meloxicam (long-acting NSAID), under geomagnetic (45T) and hypomagnetic (2T) field conditions. Acute pain testing was conducted afterwards, and statistical t-tests revealed significant difference ($p < 0.05$) between the hypomagnetic and geomagnetic field gliding phenotype at 100 meloxicam concentration; planarians glided faster when pre-incubated in hypomagnetic field. As meloxicam concentration increased, gliding increased and scrunching decreased, suggesting a mechanism may exist where hypomagnetic field exposure potentiates meloxicam's analgesic effect. This work opens possibilities for further research on how the analgesic effect of NSAIDs affects the human body during a space mission; and, by proposing that magnetic shielding can enhance analgesia, hypomagnetic field chambers on Earth can be developed to improve patients' quality of life.