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Infusion of low dose glyceryl trinitrate has no consistent effect on burrowing behavior, running wheel activity and light sensitivity in female rats

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Abstract

Introduction: Glyceryl trinitrate induces headache during infusion to man and migraine patients develop an additional migraine attack a few hours after the infusion. Recently, we have moved this model into rat with the intention of developing an animal model predictive of migraine therapy. In the current paper we have studied the effect of glyceryl trinitrate infusion on three different rat behaviors.

Methods: The stability of burrowing behavior, running wheel activity and light sensitivity towards repeated testing was evaluated with respect to estrous cycle. Finally, the effect of glyceryl trinitrate on these behaviors in female rats was observed.

Results: Burrowing behavior and running wheel activity were stable in the individual rat between experiments. The burrowing behavior was significantly affected by the stage of estrous cycle. The other assays were stable throughout the cycle. None of the three behavioral tests were altered by glyceryl trinitrate infusion. In the light-dark box, some batches of rats showed light sensitivity after treatment with glyceryl trinitrate but it could not be repeated in other batches of rats.

Discussion: We have investigated the stability towards repeated testing and the effect of i.v. glyceryl trinitrate infusion to awake rats in three behavioral assays. Of the assays evaluated, only light sensitivity was capable of detecting changes after glyceryl trinitrate infusion but, this was not repeatable. Thus, the infusion of a low dose glyceryl trinitrate to conscious rats together with the chosen behavioral tests is not a robust setup for studying immediate GTN induced headache behavior in rats.

Keywords

Animal model; behaviour; burrowing; glyceryl trinitrate; light sensitivity; methods; migraine; oestrous cycle; rat; running wheel.

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