Expression and Treatment of Pain-Depressed Behavior in Male ICR Mice
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INTRODUCTION

- Pain-related depression of behavior is a clinically-relevant treatment target.
- Recent findings suggest that research examining pain-related behavioral dysfunction or pain-related depression of behavior may complement traditional reflexive assays of pain-stimulated behavior.
- Rodent behaviors sensitive to depression by noxious stimuli include wheel-running, feeding, and operant behavior.
- Mouse nesting behavior is an innate, stable, behavior that can be studied experimentally.
- Nesting is sensitive to physiologically-relevant noxious stimuli.
- Noxious stimulus-induced (pain-related) depression of nesting is blocked by a clinically relevant analgesic (ketoprofen).

METHODS

Subjects
- Adult male ICR mice (Harlan), 25-30 g upon arrival in the laboratory
- Individually housed in plastic cages with corn cob bedding, and one 5 x 5 cm cotton “nestlet” (Fig 1A)
- Ad libitum access to food (Teklad LM-485 Rodent Chow, Harlan) and water

Behavioral Procedures
- Cages were placed on a lab bench for a 10-min acclimation period
- Treatments were administered by removing the mouse from its cage, administering the treatment, and transferring the mouse to a holding cage
- During pretreatment intervals, the home cage was prepared with six pieces of nesting material evenly distributed into six zones of the cage (Fig 1B&C)
- After expiration of the pretreatment intervals, each mouse was returned to the home cage, and nesting behavior was observed for 100 minutes.
- Nesting was operationally defined as the number of zones cleared of nesting material (Min score = 0; Max score = 5; e.g. Fig 1C&D).

Pharmacological Procedures
- 30-min prior to nesting sessions, intraperitoneal injection of 0.56% lactic acid
- 5-min prior to nesting sessions, the noxious stimulus (intraperitoneal injection of 0.56% lactic acid) was administered.

Drugs
- Ketoprofen – nonsteroidal anti-inflammatory drug (NSAID)
- Citalopram – serotonin-selective monoamine uptake inhibitor
- Nisoxetine – norepinephrine-selective monoamine uptake inhibitor
- Milnacipran – serotonin/norepinephrine monoamine uptake inhibitor

RESULTS

- 0.56% Lactic Acid significantly depressed nesting behavior. Symbols show mean zones cleared ± SD. Filled symbols indicate significant difference from H2O+H2O control (2-way ANOVA; Treatment X Time)
- Ketoprofen (10mg/kg) blocked acid-induced depression of nesting. Bars show mean zones cleared ± SD. Asterisk indicates significant difference from H2O + Acid (2-way ANOVA; Drug X Noxious Stimulus)

REFERENCES


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