UNIVERSITY OF COPENHAGEN
DEPARTMENT OF EXPERIMENTAL MEDICINE

THE EFFECT OF REFINED HANDLING IN MICE

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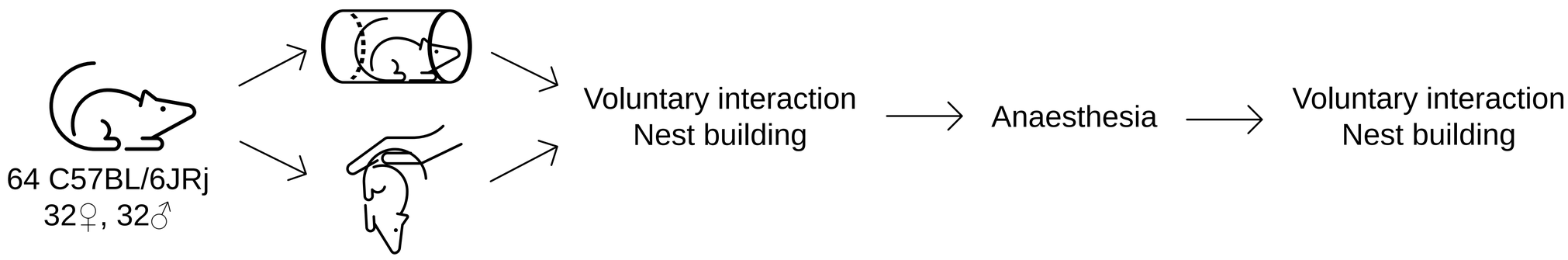
BACKGROUND

- Handling of laboratory mice is stressful to the animals[1]
- Tunnel handling is a refinement of handling resulting in reduced stress and fear compared to tail handling[2]
- Mice handled with a tunnel are more willing to interact with their handler[2]

RESEARCH QUESTIONS

- Does tunnel handling influence voluntary interaction time with a hand in the home cage?
- Does tunnel handling influence anaesthesia induction and recovery times?
- Does tunnel handling influence nest building behaviour?

METHODS



- Sixty-four C57BL/6JRj male and female mice were randomly allocated into either tunnel or tail handling groups
- Six handling sessions over two weeks – mice were handled to and from a scale for BW measurement with assigned method
- Voluntary interaction test: hand in cage 60 seconds the day before and after anaesthesia
- Anaesthesia: ketamine/xylazine/midazolam injection anaesthesia[3]
- Nest building tests: nest score (0-5)[4] and time-to-integrate-into-nest test[5] the day before and after anaesthesia

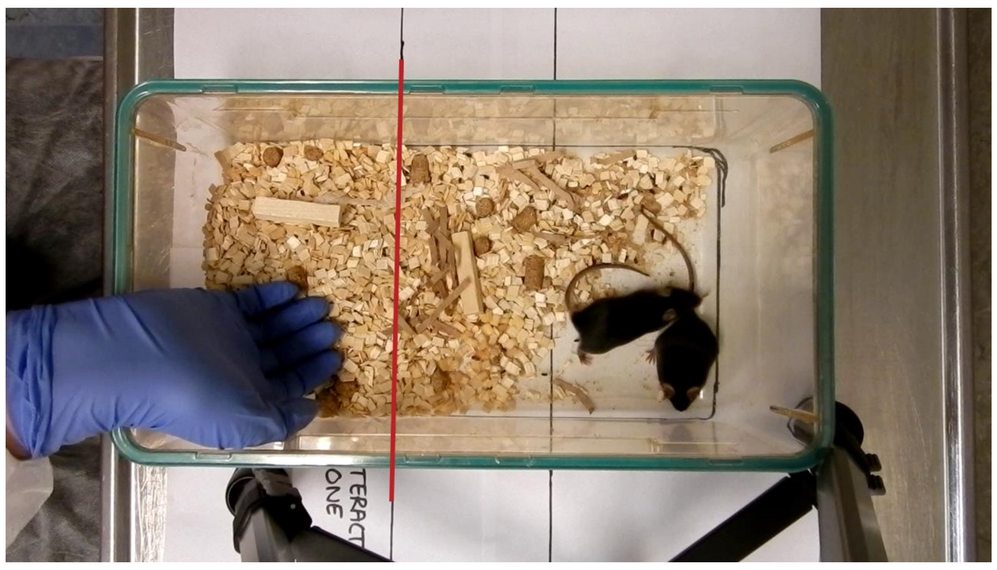


Fig 1. Picture of voluntary interaction test. When the mouse was left of the red line it was defined as interaction. Interaction time was measured for 60s and a cage average was calculated.

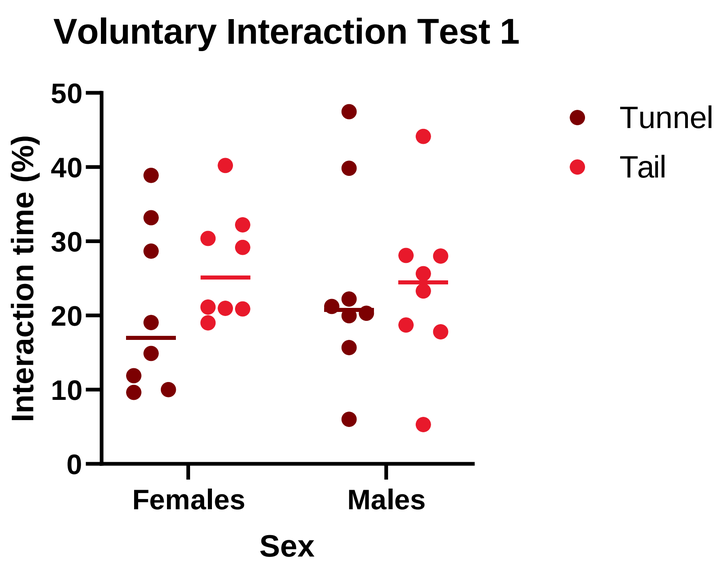


Fig. 2 Results of voluntary interaction test 1. Sample size n=8 for all groups.

RESULTS

- Voluntary interaction: No difference in interaction time between tunnel and tail handled mice
- Anaesthesia: No difference in anaesthesia induction or recovery time between tunnel and tail handled mice
- Nest building: No difference in nest score or integration of new nesting material between tunnel and tail handled mice

CONCLUSION

- No difference in behavioural tests or anaesthesia parameters between tunnel and tail handled mice
- Further research is needed to understand the effect of tunnel handling in laboratory mice

References:
1. Hurst, J. L., & West, R. S. (2010). Taming anxiety in laboratory mice. Nature Methods, 7(10), 825–826.
2. Rasmussen, S., Miller, M. M., Filipski, S. B., & Tolwani, R. J. (2011). Cage Change Influences Serum Corticosterone and Anxiety-Like Behaviors in the Mouse. Journal of the American Association for Laboratory Animal Science, 50(4), 479–483.
3. Buhr, P., Kolstrup, S., Nikolajsen, L.-L., & Bollen, P. (2023). The anaesthetic effects of ketamine/xylazine/midazolam in C57Bl/6JRj mice. Scandinavian Journal of Laboratory Animal Science, 49(4), 21–27.
4. Hess, S. E., Rohr, S., Dufour, B. D., Gaskill, B. N., Pajor, E. A., & Garner, J. P. (2008). Home Improvement: C57BL/6J Mice Given More Naturalistic Nesting Materials Build Better Nests. J Am Assoc Lab Anim Sci., 47(6), 25–31.
5. Rock, M. L., Karas, A. Z., Gartrell Rodriguez, K. B., Gallo, M. S., Pritchett-Corning, K., Karas, R. H., Aronovitz, M., & Gaskill, B. N. (2014). The Time-to-Integrate-to-Nest Test as an Indicator of Wellbeing in Laboratory Mice. Journal of the American Association for Laboratory Animal Science, 53(1), 24–28.

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