

Chemical handwarmers as an acute heat source for mice in experiment

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INTRODUCTION

Some experiments and animal models are associated with drop in animals' body temperature. It can be helped by for example use of electrical heat pads or insulation in the form of extra enrichment. However, some studies and situations demand other solutions.

Chemical handwarmers (air-activated thermal devices) were previously mentioned in literature as additional heat source for mice after surgeries¹. We have tested its applicability for mice in studies at Lundbeck.

SET-UP

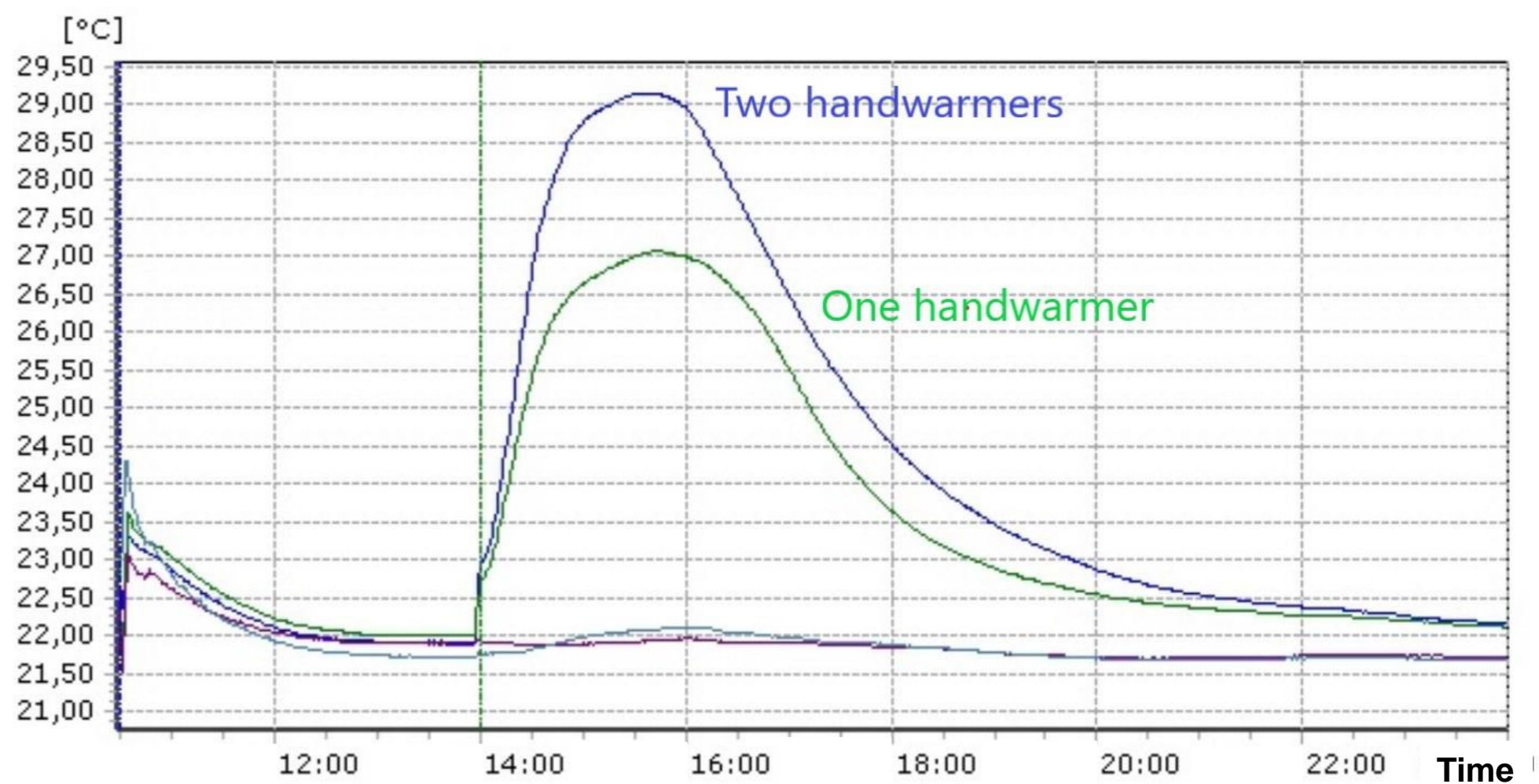
One or two chemical handwarmers (disposable, warms up to 12 hours, 5x8 cm) were fixed under the cages with tape, so they were placed beneath the shelter (start 14:00). The temperature at the level of bedding material was continuously measured (every second minute) with the help of temperature loggers (TrackSense® Pro Wireless Data Loggers, Ellab) located under the shelter.

Two standard cages with standard enrichment (bedding, shelter, nesting material, chewing stick) were used (one for each set-up). Control loggers were placed in the front of the cage near feeder. No animals were in the cage during the experiment.

Data from loggers were analyzed with ValSuite validation software (Ellab).



Just example



RESULTS

Temperature under the shelter raised rapidly for up to 29°C by using two handwarmers and was over 25°C for four hours.

By using one handwarmer the temperature under the shelter could be increased for up to 27°C and was about 23,5°C after four hours.

OUR EXPERIENCE

We have successfully used handwarmers as a heat source during the first 18 hours after two MPTP injections in mice when no other heat sources were practically applicable. MPTP is toxic substance, which is used to induce mice model of Parkinson's disease. It induces hypothermia in mice, that can lead to death of the animal.

Application of two handwarmers resulted in survival of all mice. Animal technicians observed that animals hid together under the shelter and that their condition seemed to be improved in contrast to previous studies (with no heat source).

CONS and PROS

- Easy and ready to use
- Rapidly activated
- Inexpensive
- Demands little time to be applied
- Safe (at least when two warmers are used)
- Can be used for animals after surgery, if recovery is prolonged
- Can be used in experiments, where disposable solution is preferable
- Can be used if other heat sources are not available or applicable
- Can be placed under the desired place to be warmed up
- Animal can escape the warmth, as only limited area is heated up
- Must be changed every 4 to 6 hours

REFERENCE

1. Beale CN, Esmail MY, Aguiar AM, Coughlin L, Merley AL, Alarcon Falconi TM, Perkins SE. Use of Air-activated Thermal Devices during Recovery after Surgery in Mice. J Am Assoc Lab Anim Sci. 2018 Jul 1;57(4):392-400.

CONCLUSION

Two chemical handwarmers can be safely used as a temporal heat source for mice and should be changed every 4 to 6 hours for maintaining of the optimal temperature under the shelter.

This approach can be used in situations when the animal acutely needs additional heat, for example after surgery if recovery is prolonged, or during other conditions when the animals are hypothermic, and no other heat source is available.