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Possible Causes and Treatment of Leg Injuries in Syrian Hamsters in Captivity

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Abstract

The Syrian guinea pig Mesocricetus auratus runs a lot on the exercise wheel. This running can cause leg injuries. Three treatments for these wounds, topical vitamin E, wheel locking, and a combination of the two, were compared for both sexes. At the end of the pretreatment period, none of the animals without the wheel developed foot ulcers, while at least 75% of the females and 100% of the males had the wheel sores. Women have fewer and smaller wounds than men during this period. At the end of the treatment period, no effect of vitamin E was seen, but significant scarring occurred after vane occlusion in both men and women. Wheel locks are an easy way to prevent or treat foot injuries, but it poses animal welfare problems because wheels are an important addition to a hamster's cage.

Keywords: Leg injuries; Foot ulcers

Introduction

The Syrian hamster Mesocricetus auratus uses wheels extensively in captivity. They can do more than 10,000 spins in one night. This running may or may not be stereotypical, but it is voluntary and is likely a self-perpetuating behaviour. After baby hamsters first start running on wheels in our lab, sores often appear on their pads or toes. These foot sores, not to be confused with the skin lesions that sometimes develop on one side of the leg when sliding between the bars of a wheel, often take the form of small cuts or spots that quickly crust over. Some of them can grow up to several millimeters long, but they don't stop the hamsters from continuing to run in their wheels [1]. Foot wounds can form without wheels in other rodents and in some types of cages, but they take longer to develop than with wheels. For example, rats take 400 days to injure their legs without wheels while hamsters need only 10–15 days with wheels. This indicates that running was likely the cause of the injury, although this has never been formally examined by the post-wheel injury watchdog. Beaulieu and Reebs documented the effect of different barn lining materials and running wheel surfaces on the formation of leg wounds in hamsters. They found that men ran more than women, but injuries were similar in both sexes. However, women tend to have more front leg injuries, and their injuries tend to last longer [2-4]. Hamsters on a pine base have fewer wounds than on a piece of hardwood. In addition, hamsters with wheels wrapped in plastic mesh took longer to develop wounds than those with wheels with bare metal rods, although these wounds were larger once formed and last longer [5]. The researchers found that many of the wounds did not heal during the study period and they recommended veterinary treatment. One such treatment could be vitamin E. The effect of topical vitamin E on scar reduction has been studied in humans and rats, although firm conclusions about its effectiveness are not yet know [6,7]. However, its ability to protect against UV damage to the skin is well established. The objective of this article was to first confirm that wheel activity is the cause of leg ulcers, and then compare the effectiveness of vitamin E treatment with the most effective alternative block the moving wheel Because there were small differences between men and women in running levels and leg injury formation, both sexes were examined.

Material and Method

All protocols were approved by the University of Moncton Animal Care Committee in accordance with the ethical guidelines established by the Canadian Council on Animal Care. Syrian hamsters were purchased from Charles River Canada. All of them were 60 days old at the start of testing and had no prior running wheel experience. The sexes were tested separately over time to avoid the influence of smell and sound on behavior. Ambient temperature was set at 21°C and humidity between 45 and 60%. The light intensity is 1,000 lux. Light:dark cycle is 14:10 o'clock. This long photoperiod is often used in the laboratory, especially in circadian timing studies, as it keeps hamsters in the breeding phase and therefore active [8-10]. All cages are lined with shavings, distilled water and pellets at the bottom of the cage. According to handling, some cages have motor wheels 35cm in diameter, 9.5cm long, 2mm thick stainless steel bars, 7mm spacing between bars, Nalgene brand, size F for mice. The Canadian Council on Animal Care recommends the use of a mouse-sized wheel for hamsters, and this is the type commonly used in our lab. Wheel counts were recorded daily, but equipment failure prevented us from obtaining complete data sets, which made it impossible for us to quantify the relationship between running intensity and severity of wound on the outside of the wheelless dichotomy. Wheelless cages are given wooden toys, a wooden platform and part of the Habitrail tunnel to enrich the cages (Figure 1). Five

Figure 1: Leg injuries in Syrian Hamsters in captivity.

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experimental groups were randomized according to treatment and room location. Five animals of each sex are assigned to each of these five groups. The groups included three treatments and two controls. All three treatment groups underwent a wheel-ready pretreatment period until at least 70% of the hamsters had at least one foot wound, lasting 15 days [11-13]. This was followed by a 45-day treatment period from day 15 to day 60. The treatment consisted of (a) locking the wheel, (b) letting go but applying Vitamin E Life Natural Source, 1000 IU, purity daily on the wound, or (c) by locking the wheel and applying vitamin E to the wound. Vitamin E is contained in a capsule; one drop is applied to the wound. This form is used because it is unmanageable; an important factor to consider is that hamsters can lick their paws [14,15]. The two control groups were also followed for 60 days, with the first 15 days being counted as a virtual pretreatment period and the next 45 days as a virtual treatment period, but they were never treated if and when the lesions were treated. Foot injury appeared. The first control group never had access to the running wheel, while the second control group always had the free wheel available. Feet were examined once daily in all hamsters. During the test, the wounds were counted, the size of each wound was measured with a 15 cm ruler graduated in millimeters, and vitamin E was applied if necessary to the test group. During the inspection and handling of the claws, the hamsters were grabbed by the neck and put into a surrender position.

Results

During pretreatment, all the men who had access to the wheel suffered at least one injury, while the control men with the locked wheel were uninjured. After starting treatment for males, it took about 15 days for most wounds to heal in both groups of experimental locked wheels, whether or not vitamin E was applied to their leg wounds, whether or not they took a vitamin E supplement. The results were similar for women, although somewhat less obvious. At least 75% of women with wheels had at least one wound at the end of pretreatment, but as with men, all women with wheels were free of wounds. The women without a wheel during the treatment phase did not completely heal, while those with a jammed wheel healed within 15 days, although some did develop some new lesions afterwards, unlike Like men, they remained uninjured until day 60.

Discussion

The results clearly showed that the rolling wheel was responsible for the formation of foot wounds in the hamsters. During pretreatment, no wheeled hamster suffered a single leg injury, whereas most wheeled hamsters did. During the treatment, the hamster kept the wheel from healing, while blocking the wheel, the wound almost completely healed within 15 days. In some women with locked propellers, the wound problem re-emerged after day 30, but to a lesser extent than with the propeller during pretreatment. This reoccurrence may be due to the females sometimes hanging and slipping the hard cloth that closes the top of their cage. Very small wounds appeared on the front legs of the wheelless females, possibly due to this climbing activity. The absence of such injuries in men cannot be explained by differences in climbing propensity, as both sexes have similar climbing abilities, but may be related to differences in weight between men and women, as women are on average heavier than women. males and may have slipped more. No curative effects of vitamin E application have been detected. However, the effectiveness of our application method may have been affected by the fact that the hamsters licked their paws as soon as they were returned to the cage and thus removed at least some of the gel coating. . Vitamin E treatment could be retested with wraps or other means that might prevent animals from licking their paws, at least temporarily. Because this experiment showed that a spinning wheel caused a leg injury and that blocking it helped the wound heal, one could argue that complete removal of the wheel would be the treatment of choice. However, wheels are an important source of nutrition for hamsters, and wheeling is a self-reinforcing behavior. Our wheel count dataset, while incomplete, has revealed an average of almost 8,000 revolutions per night. Even the animal that was excluded from the experiment because one of its legs was too infected was still running on the wheel with a lame leg at the time. If wheel stoppers are used to treat a leg wound, it is important for animal welfare to unlock the wheel as soon as healing is complete, although of course the wound can then be reappears. Daily partial wheel lock mode combined with other cage enrichment operations for offset may indeed be preferred, but this remains to be investigated. The relationship between the occurrence of leg injuries and the intensity of running is still unknown. The hamster wheels in our lab are very large, which they prefer, and therefore they run very hard. If foot injuries are caused solely by extreme travel, partial wheel blocking can help minimize or prevent wound formation without much impact on animal welfare.

Conclusion

Spinning wheels are the cause of foot injuries in hamsters, and spinning wheel locks are an effective treatment for foot injuries. Daily application of vitamin E gel did not affect the appearance, size and number of wounds, although the effectiveness of the gel may be impaired by animals licking the minus some gel from their paws. A recommendation to block the wheel for several weeks after the onset of a leg injury can be made, although animal welfare considerations and cage enrichment allow the choice to limit this treatment to those situations.

References

1. Fletcher CDM, Bridge JA, Hogendoorn P, Mertens F (2013) WHO Classification of Tumours of Soft Tissue and Bone. IARC, Lyon 4.
2. Hasegawa T, Matsuno Y, Shimoda T, Hirohashi S, Hirose T, et al. (1998) Frequent expression of bcl-2 protein in solitary fibrous tumors. Jpn J Clin Oncol 28: 86-91.
3. England DM, Hochholzer L, McCarthy MJ (1989) Localized benign and malignant fibrous tumors of the pleura. A clinicopathologic review of 223 cases. Am J Surg Pathol 13: 640-658.
4. Vallat-Decouvelaere AV, Dry SM, Fletcher CD (1998) Atypical and malignant solitary fibrous tumors in extrathoracic locations: evidence of their comparability to intra-thoracic tumors. Am J Surg Pathol 22:1501-1511.
5. Babar Kayani, Aadhar Sharma, Mathew D Sewell, Johnson Platinum, Andre Olivier, et al. (2018) A Review of the Surgical Management of Extrathoracic Solitary Fibrous Tumors. Am J Clin Oncol (7): 687-694.
6. Park MS, Patel SR, Ludwig JA (2011) Activity of temozolomide and bevacizumab in the treatment of locally advanced, recurrent, and metastatic hemangiopericytoma and malignant solitary fibrous tumor. Cancer 117: 4939-4947.
7. Roughley PJ, Mort JS (2014) the role of aggrecan in normal and osteoarthritic cartilage. J Exp Orthop 1: 8.
8. Witkin GB, Rosai J (1989) Solitary fibrous tumor of the mediastinum: a report of 14 cases. Am J Surg Pathol 13: 547-557.
9. Cranshaw I, Gikas P, Fisher C (2009) Clinical outcomes of extra- thoracic solitary fibrous tumours. Eur J Surg Oncol 35: 994-998.
10. Baldi GG, Stacchiotti S, Mauro V (2013) Solitary fibrous tumor of all sites: outcome of late recurrences in 14 patients. Clin Sarcoma Res 3: 4.
11. Little PJ, Drennon KD, Tannock LR (2008) Glucosamine inhibits the synthesis of glycosaminoglycan chains on vascular smooth muscle cell proteoglycans by depletion of ATP. Arch Physiol Biochem 114: 120-126.
12. Gengler C, Guillou L (2006) Solitary fibrous tumour and haemangiopericytoma: evolution of a concept. Histopathology 48: 63-74.

13. Doyle LA (2014) Sarcoma classification: an update based on the 2013 World Health Organization classification of tumors of soft tissue and bone. Cancer 120: 1763-74.

14. Briselli M, Mark EJ, Dickersin GR (1981) Solitary fibrous tumors of the pleura: eight new cases and review of 360 cases in the literature. Cancer 47: 2678-2689.

15. Gold JS, Antonescu CR, Hajdu C (2002) Clinicopathologic correlates of solitary fibrous tumors. Cancer 94: 1057-1068.