

Evidence-Based Advances in Rodent Medicine



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KEYWORDS

• Guinea pig • Rat • Dental disease • Mammary gland tumor • Deslorelin

KEY POINTS

- In case of hyperadrenocorticism diagnostics in guinea pigs, an adrenocorticotrophic hormone stimulation test and analyses of saliva cortisol concentrations are recommended.
- Uroliths in guinea pigs are mostly of calcium carbonate origin, so other factors than dietary need to be considered in case of urolithiasis.
- In guinea pigs, itopride can be used as a potent gastrointestinal motility stimulant.
- In case of dental diseases in rodents, more attention should be focused on phosphorus dietary content, altered tooth structure, and jaw calcification.
- Prevention of mammary gland tumors is based on ovariectomy before 7 months of age and on weight management.

INTRODUCTION

The number of exotic companion pet rodents seen in veterinary practices is growing very rapidly. According to the American Veterinary Medical Association's surveys, more than 2,093,000 pet rodents were kept in US households in 2007 and in 2012 it was more than 2,349,000 animals.¹ The most commonly kept species are guinea pigs (*Cavia porcellus*), hamsters (*Mesocricetus auratus*, *Phodopus sp*, *Cricetulus sp*), gerbils (*Meriones unguiculatus*), rats (*Rattus norvegicus*), and chinchillas (*Chinchilla lanigera*). All of these species have been used in experimental research as models for human diseases for decades. The number of publications in scientific journals dealing with the aforementioned species is tremendous. When searching Web of Knowledge² for the last 10 years (2006–2016), it was found that a rat in the title or topic was used in 558,792 publications. In the case of a guinea pig, hamster, gerbil, and

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chinchilla, it was 21,633, 18,415, 3412, and 921, respectively. Because of the spread of exotic companion mammal societies, conferences, and specialty colleges, the number of publications in veterinary medicine also increased, especially in the last 10 years.

However, only a small part of the literature is composed of properly designed research. This article summarizes the most important evidence-based knowledge in exotic pet rodents. The information presented is graded based on the Grades of Recommendation, Assessment, Development, Evaluation guidelines.³

EVIDENCE-BASED ADVANCES IN DIAGNOSIS

Diagnosis of Hyperadrenocorticism in Guinea Pigs

Hyperadrenocorticism (Cushing syndrome) was recently described as the third most common endocrinopathy in guinea pigs. Both adrenal-dependent hyperadrenocorticism and pituitary-dependent hyperadrenocorticism can be present.^{4,5} The clinical signs include nonpruritic, bilateral symmetric alopecia (**Fig. 1**), thinner skin, polyuria, polydipsia, muscle weakness, and weight loss.⁶ Diagnosis was previously based on clinical and ultrasonic findings, on high plasma cortisol levels, and by using adrenocorticotropic hormone (ACTH) response test. However, as guinea pigs have relatively large adrenal glands and their size estimation based on body weight or other physiologic/anatomic parameters is not published and high levels of circulating cortisol,⁷ which fluctuate diurnally and can be influenced by many other factors, the diagnostic accuracy of these techniques is likely limited.⁸

Similarly to the study by Fenske,^{9,10} Nemeth and colleagues¹¹ revealed a high biological relevance of noninvasive cortisol measurements in saliva and fecal samples (fecal glucocorticoid metabolites [FGM]) of domestic guinea pigs. Saliva cortisol and FGM levels measured in samples adjusted to the appropriate gut passage time were both significantly increased in response to the social confrontations and were highly correlated to the actual circulating cortisol levels in plasma. Saliva cortisol concentrations were exclusively affected by the experimental conditions, with no day-related effects. Only saliva cortisol concentrations proved successful in predicting plasma cortisol levels, which was not the case for FGM levels. As saliva can be easily sampled with much less disturbance than blood sampling procedures, repeated saliva cortisol measurements can also be used for long-term cortisol level monitoring.¹² In case of an ACTH response test in healthy animals, after the intramuscular administration of the ACTH (20 IU), salivary cortisol concentration increased from 2.2 ng/mL to

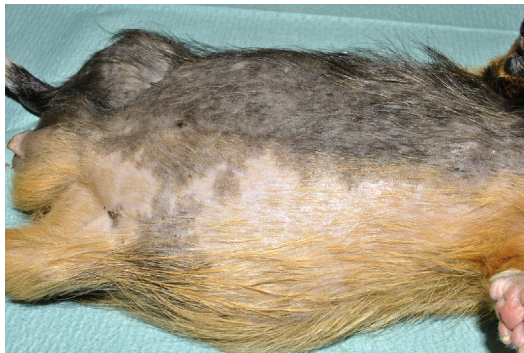


Fig. 1. Alopecia of the ventral abdomen in a male guinea pig with hyperadrenocorticism.

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