

PREVALENCE OF SARCOPTIC MANGE IN PET RABBITS (*ORYCTOLAGUS CUNICULUS*) IN ISRAEL

Short communication
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ABSTRACT

The prevalence of the skin mite, *Sarcoptes scabiei*, in pet rabbits in pet stores in Israel was investigated by a diagnostic evaluation of twofold skin scrapings from the distal forelimbs. *S. scabiei* was found in 20 of 245 rabbits (8.2%). Clinical signs of crusting of the paws were observed in all infested rabbits. Sarcoptic mange due to *Sarcoptes scabiei* infestation is considered an uncommon disease in rabbits. To the best of the author's knowledge this is the first report on the prevalence of sarcoptic mange among pet rabbits in Israel.

Key words: Mange, *Sarcoptes scabiei*, Rabbits, *Oryctolagus cuniculus*, Israel

INTRODUCTION

Sarcoptes scabiei is a burrowing mite that inhabits the epidermis of the skin and causes sarcoptic mange in mammals and humans (1). The name *Sarcoptes scabiei* is derived from the Greek words "sarx" (flesh) and "koptein" (to cut) and the Latin word "scabere" (to scratch) (2). The genus *Sarcoptes* includes one species, *S. scabiei*, but mites are further identified by a variety name indicating the host species (e.g., *S. scabiei* var. *cuniculi*) (1). The entire life cycle of *S. scabiei* takes place on the host (1). Fertilized female mites create pseudo-tunnels in the outer skin layers, and lay eggs in these tunnels. Young larvae can also be found within the skin while older larvae, nymphs, and males dwell on the skin surface (1). Mites feed on lymph and sloughed epithelial cells (3). Diagnosis of *S. scabiei* can be made by identification of the mite by microscopic examination of skin scrapings (1). In rabbits, infection with *S. scabiei* induces relative protection against subsequent infections (4). Aspects of public health concern are of importance, as direct transmission from handling of a rabbit infested with *S. scabiei* can cause a self-limiting dermatitis in humans (2).

The feeding behavior of larvae and nymphs cause irritation, hypersensitivity reaction, and inflammation, with subsequent hyperkeratosis, seborrhea, and alopecia (5). Lesions most commonly appear on the face, neck, and ears of rabbits (3). The intense pruritus often causes alopecia and dermal abrasions, commonly developing to serous encrustations and secondary bacterial dermatitis (5). Clinicopathologic changes associated with sarcoptic mange in rabbits included anemia and leukopenia and hepatic or renal amyloidosis in severe cases (5). Chronic cases can lead to anorexia, lethargy, emaciation and death (5).

The aim of this study was to determine the prevalence of sarcoptic mange among rabbits sold in pet stores in Israel, as there is no available data from this geographical location.

MATERIALS AND METHODS

Rabbits sold in pet stores were used in this study and store owners gave their consent for their examination. Animals were examined for the prevalence of the skin mite *S. scabiei* from October 2009 to March 2010. None of the rabbits had received any prior ectoparasite treatment.

Physical evaluation was performed in all rabbits. Diagnostic samples were collected from skin lesions in symptomatic rabbits. Skin scrapings were taken from both distal forelimbs, using a #10 blunt scalpel blade dipped in liquid paraffin. Samples were collected and included dermis, epidermis, scales and hair. The samples were examined under a light microscope (x10-40) to determine the presence of the mite.

RESULTS

A total of 34 pet stores were surveyed in this study, each holding an average of 8.8 rabbits (range 2-12). Two hundred and forty five rabbits were examined of which 152 were females and 93 were males. Their weight range was between 0.25-3.5 kg. All rabbits were reported to be less than 1 year of age ranging from 1 to 12 months of age. The rabbits originated from a variety of pure and mixed breeds. The rabbits used in this study had no prior medical history.

S. scabiei mites were positively identified in 20 of 245 rabbits (8.2%) of which 60% (n=12) were males and 40% (n=8) were females. All of the identified rabbits showed clinical signs that are typically associated with sarcoptic mange. A large number of mobile, round-bodied mites were observed amongst the hairs and keratinous debris. All of the stages of the mite's life cycle were identified, including adult mites, nymphs, larvae and eggs. A nearly complete agreement (90%) was observed between the left and right limb samples. In only two cases were the mites identified on only one sampled limb. No other ectoparasites were observed.

The most common lesions manifested in all symptomatic rabbits (n=20) were distal limbs hyperkeratosis and toe nail deformation and elongation (Figure 1). The dorsal surfaces

of the paws were crusted and deeply fissured similar to the crusted scabies (synonym: Norwegian scabies, parakeratotic scabies) seen in humans (2). Other lesions were also noticed and included nasal hyperkeratosis in 40% of cases (n=8) and truncal (n=5) or facial (n=7) alopecia. Pruritus was observed in 11 infested rabbits (55%).

DISCUSSION

Differential diagnosis for hyperkeratosis and alopecia in rabbits includes: psoroptic mange (*Psoroptes cuniculi*), notoedric mange (*Notoedres cati*), *Cheyletiella* sp. dermatitis, dermatophytosis, and sarcoptic mange (*Sarcoptes scabiei*) (4). Microscopic evaluation of the morphology and physical characteristics of the mites can be used to differentiate sarcoptic mites from other mites that are found in rabbits (4). Sarcoptic mites have a thick body wall, with large spines on the dorsal surface (4). The mites have a round body, short legs, a long, unjointed stalk with a sucker on front pairs of legs, vertical setae and a terminal anus (4). The dorsum has scales, cones, and bladlike setae. The female mites are white, covered with fine parallel striae, and measure 303 to 450 μm in length and 250 to 350 μm in width (4, 5).

S. scabiei mange is described as a rare to uncommon disease in rabbits (5, 6). Some reports suggest that it is more commonly found in some parts of the world, such as Africa (5). One report from India showed an overall 9.3% incidence of mange infestation in rabbits (7). In that report the mange incidence in Soviet Chinchilla rabbits was found to be 32.6% and in German Angora rabbits 17.6%, while White Giant and New Zealand White rabbits were free from mange infestation (7).

No obvious risk factors were identified in this survey but it is possible that young animals (< 1 year) as surveyed in this study were more susceptible to *S.scabiei* infestation as was also suggested for fur mites in rabbits (8). Symptomatic rabbits in this study were reported to show clinical signs of sarcoptic mange within 10-14 days from their arrival to the store. Since human crusted scabies tends to occur in patients with impaired cell-mediated immunity (2), it is possible that these infested rabbits had an impaired immune status. Relocation, early weaning, sudden diet change, crowding and improper handling could have been among the contributing factors for their possible immunosuppression.

Samples were collected in this study during the Mediterranean winter season (October to March). It is suggested that the winter months offer favorable climate conditions for all life stages of *Sarcoptes* leading to a considerable increase in the mite population (9). The seasonality of the occurrence of sarcoptic mange was also observed in captive wild ruminants in zoological gardens in Israel (10).

In conclusion, a relatively high prevalence of *S. scabiei* mites was observed in pet rabbits in Israel. The risk that humans and other animals may be exposed to sarcoptic mange from newly adopted pet rabbits must be borne in mind and veterinarians should advise prospective owners of this possibility.

REFERENCES

1. Suckow, M.A., Brammer, D.W., Rush, H.G. and Chrisp, C.E.: Biology and diseases of rabbits. In: Fox, J.G., Anderson, L.C., Loew, F.M. and Quimby, F.W. (Eds.): Laboratory animal medicine. 2nd ed. Academic Press, Inc., San Diego, California, pp.349-350, 2002.
2. Hengge, U.R., Currie, B.J., Jäger, G., Lupi, O. and Schwartz, R.A.: Scabies: a ubiquitous neglected skin disease. *Lancet Infect. Dis.* 6:769-779, 2006.
3. Hofing, G.L. and Kraus, A.L.: Arthropod and helminth parasites. In: Manning, P.J., Ringler, D.H. and Newcomer, C.E. (Eds.): The biology of the laboratory rabbit. 2nd ed. Academic Press, Inc., San Diego, California, pp. 231-257, 1994.
4. Radi, Z.A.: Outbreak of sarcoptic mange and malasseziasis in rabbits (*Oryctolagus cuniculus*). *Comp. Med.* 54:434-7, 2004.
5. Scott, D.W., Miller, W.H. and Griffin, C.E.: Dermatoses of pet rodents, rabbits and ferrets. In: Scott, D.W., Miller, W.H. and Griffin, C.E. (Eds.): Muller and Kirk's Small Animal Dermatology. W.B. Saunders, Philadelphia, PA .pp. 1415-1458, 2001.
6. Percy, D.H. and Barthold, S.W.: Pathology of laboratory rodents and rabbits. Blackwell Publishing Professional, Ames, Iowa, p. 296, 2007.
7. Soundararajan, C. and Iyue, M.: Incidence of mange infestation in rabbits. *J. Vet. Parasitol.* 19: 2, 2005.
8. Kim, S.H., Jun, H.K., Song, K.H., Gram, D. and Kim, D.H.: Prevalence of fur mites in pet rabbits in South Korea. *Vet. Dermatol.* 19(3):189-90, 2008.
9. Arlian, L.G., Vyszynski-Moher, D.L. and Pole, M.J.: Survival of adults and development stages of *Sarcoptes scabiei* var. *canis* when off the host. *Exp. Appl. Acarol.* 6:181-7, 1989.
10. Yeruham, I., Rosen, S., Hadani, A. and Nyska, A.: Sarcoptic mange in wild ruminants in zoological gardens in Israel. *J. Wildl. Dis.* 32(1):57-61, 1996.

FIGURE LEGENDS



Fig. 1
Photograph of a New Zealand White rabbit identified in this study with *S.scabiei*. The most conspicuous lesion is the crusting fissured dorsal surface of the distal limbs.