



Mange Infestation and its Successful Treatment in Rabbits

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ABSTRACT

Twenty two pet rabbits were brought to the VCC, IIVER, Rohtak with the history of itching, alopecia and inappetance during one year of course. Out of 22 animals, 14 were males and 8 were females between 6-18 months of age group. Upon clinical examination it was observed that the rabbits had pruritus, alopecia, hyperkeratosis and crust on both ears, face, limbs and back region of body. Mite infestation in all the cases diagnosed by skin scrapping. On microscopic examination, *Sarcoptes* species in 20 cases and *Demodex* species in 2 cases were observed. Treatment course includes chlorpheniramine maleate, enrofloxacin, ascorbic acid, multivitamin and ivermectin. Gross lesions faded out within 15 days and all animals shows uneventful recovery in 45 days of therapy.

HIGHLIGHTS

- Mange infestation common in rabbits.
- Pruritus, alopecia and cachexia are common findings.
- Secondary bacterial infections may occur.
- Ivermectin can be successively used.

Keyword: Demodex, Ivermectin, Mites, Rabbit, *Sarcoptes*, Skin scrapping

Mites' infestation mainly due to *Sarcoptes scabiei* is one of the major problems in rabbit farming (Darzi *et al.*, 2007) and is highly contagious and infectious disease caused by variety of mite species (Perrucci *et al.*, 2005). Mange infestation is one of the major problem which causes highly economical loss in commercial rabbit flocks (Arlian and Morgan, 2017). Mites infestation in rabbit population causes severe production loss in terms of poor leather quality, poor fur quality, decreasing conception rates in females, loss of general body weight, and high mortalities in flocks (Shang *et al.*, 2014). It is also observed that mange in rabbit population is equally susceptible in all age groups and both sexes (Elshahawy *et al.*, 2016). However, severe infestation may causes heavy mortality in young ones and debilitated animals (Bornstein and Samuel, 2001). Mange in rabbits is characterized by pruritus, alopecia

on face, ears, back and limbs and chronic illness with severe cachexia (Choe *et al.*, 2020). In 1991, Davies and his coworkers reported that the clinical signs of includes pruritis, seborrhea, alopecia, hypersensitivity reaction, crusting and hyperkeratosis. Chronic cases of *Sarcoptes* and *Demodex* mange may cause inappetance, poor body condition and death mostly in young rabbits (Scott *et al.*, 2001). High rearing density and poor hygienic conditions are the major factors in case of *Sarcoptes* and *Demodex* infestation (McCarthy *et al.*, 2004). In mange, lesions are

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mostly seen in both ears, around nose, feet and perineal area (Kachhawa *et al.*, 2013). Crusty lesions are mostly seen at the ear margins (Reddy *et al.*, 2016). In addition to these clinical signs, Ulutas and his coworkers (2005) noted that mite infestation is also associated with vestibular dysfunction and meningitis. These mites continuously feed on the stratum granulosum of skin epidermis which are responsible for dry crusty lesion, pruritus and other skin problems (McCarthy *et al.*, 2004). With severe infestation, blood loss with secondary bacterial infections may occur (Swe *et al.*, 2014).

MATERIALS AND METHODS

Twenty two rabbits (14 males and 8 females) of 6-18 months of age were presented in clinic with the history of itching, inappetance and rough skin coat over face, ears, around nose, neck, limbs and back of body since 20-30 days. No medicinal treatment was given previously in 13 cases. Other 9 animals were treated with antibacterial and antifungal lotion topically along with some antifungal tablets, but no improvement was observed in any of these animals. Clinical examination of all rabbits showed normal physiological parameters. Multiple skin lesions include alopecia, pruritus, dry crusty lesions on face, ears, around nose, neck, limbs and back region of body (Fig. 1). One of rabbit injured his own eye during itching.

Similar lesions were also observed in both forelimbs. Due to severe dermatitis, rabbits were dull, depressed and dreadful in appearance.

Skin scrapping was carried in all rabbits and sample of skin scrapping was taken aseptically from neck and back region of body. Skin was scrapped at the periphery with a sharp, clean, and sterilized scalpel till oozing of the blood. Mineral oil was used as moistening agent. The microscopic examination of the skin scrapping from the affected rabbits confirmed presence of *Sarcoptes* (Fig. 2) in 20 cases and *Demodex* (Fig. 3) in 2 cases. In all cases, treatment included drugs given by parental route, except multivitamin which was given by oral route. Broad spectrum antibiotic, injection enrofloxacin @ 5 mg/kg, to prevent and combat secondary bacterial infection; injection ascorbic acid @ 25 mg/kg; injection chlorpheniramine maleate @ 0.4 mg/kg; and multivitamin syrup @ 5 drops once a day for 7 days on daily basis. Injection ivermectin @ 0.2 mg/kg was given subcutaneously on weekly basis for 6 weeks.

RESULTS AND DISCUSSION

All the rabbits responded to the treatments within 15 days of therapy. In all animals, itching completely disappeared after 14 days of therapy and appetite returned to normal in all cases. Animals were re-examined for mites by taking skin scrapping on 14th and 28th day of treatment protocol.

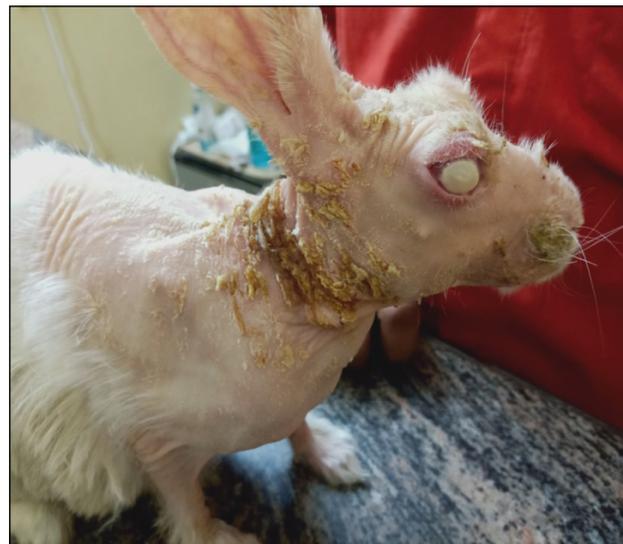
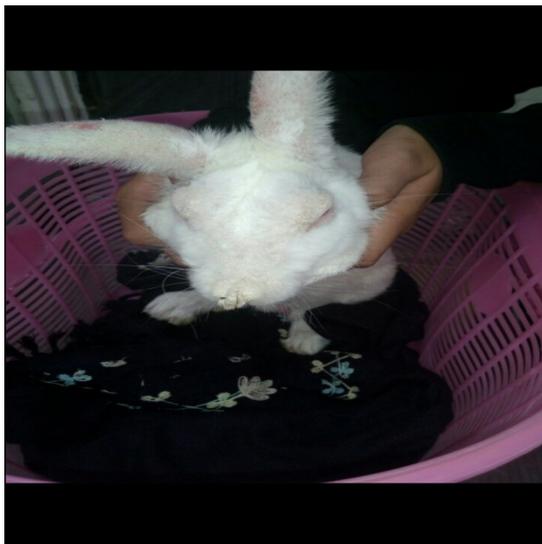


Fig. 1: Showing multiple dry crusty lesions



Fig. 2: Sarcoptes under 10X magnification



Fig. 3: Demodex under 10X magnification



Fig. 4: Completely disappeared crusty lesions



Fig. 6: New hair begins to grow

Both skin test revealed absence of mites in all of the cases under treatment. With time, crust started to disappear and after 1 month of treatment, crust completely disappeared and skin tone become smooth (Fig. 4). New hair begins to grow on ears, face and back of body (Fig. 5). All the rabbits showed complete recovery after 45 days of therapy. In all cases, owner was advised to keep hygienic environment around their pet. Keep surrounding clean and dry. Regular disinfection of rabbit cages was advised. After 45 days of treatment, in all cases, no mite infestation was observed in next 3 months of observation.

Both Sarcoptes and Demodex mites deeply affects epidermis of skin and both are highly contagious so they can easily transmit from one animal to other through indirect contact with contaminated fomites or environment

(Panigrahi and Gupta, 2013) or direct contact (Singh *et al.*, 2019). Mange infestation caused by *Sarcoptes scabiei* is common in rabbits, which is characterized by presence or absence of pruritis, specific morphology of mite and pattern of lesion distribution (Bhardwaj *et al.*, 2012). In the present case, the lesions were distributed in the ear margins, nose, face and legs. Similar distribution of lesions was also observed by Prakash *et al.*, 2017). Skin scraping is the most widely used diagnostic approach to confirm the presence of both Sarcoptes and Demodex mites in suspected animals (Sajid *et al.*, 2017). Also, some serological tests like enzyme-linked immunosorbent assay can be used to detect the antibodies against *Sarcoptes scabiei* (He *et al.*, 2017). Polymerase chain reaction (PCR) is regarded as a highly sensitive, reliable, and specific tool

for mites' diagnosis (Sajid *et al.*, 2017). Effective treatment of mites in rabbits includes some anti-parasitic and acaricides drugs (El-Ghany and Wafaa, 2022). Avermectin derivative group includes ivermectin (Sharun *et al.*, 2019), doramectin (Singari *et al.*, 2001) and selamectin (Farmaki *et al.*, 2009) can be used in treatment of sarcoptic and demodectic mange in rabbits. Ivermectin bind selectively to glutamate gated and gamma-aminobutyric acid (GABA) gated chloride channel which cause hyperpolarization of cell, paralysis and death of mites (Singh *et al.*, 2019). Ivermectin may cause the release of free radicals, which results in cytotoxic effect on the parasite (Behera *et al.*, 2011). Subcutaneous administration of Ivermectin is effective in mixed mange infestation involving *Sarcoptes*, *Otoedres*, and *Psoroptes* in rabbit (Panigrahi *et al.*, 2016). All of the Ivermectin injectable treatment protocols for treating Sarcoptic mange involves multiple dosing. This is because mite eggs are resistant to acaricidal products and thus multiple treatments at various intervals are required to ensure presence of active drug during the time of hatching (Arends *et al.*, 1999). *Sarcoptes scabiei*-infested rabbits showed recovery after 4 successive ivermectin treatments at a dose of 200 µg/kg b/wt at weekly intervals with supportive therapy using pheniramine maleate (Meenakshisundaram and Anna, 2016). In 2000, Wagner and Wendlberger treated mites infestation in rabbits by orally with 0.2 mg/kg moxidectin in case of psoroptic infestation without showing any ill effect. In contrast, ivermectin may have some negative effects on body like genotoxic and cytotoxic effects (Gaballh *et al.*, 2017). Also, in 2004, Currie and his team stated that *Sarcoptes scabiei* may developed resistance against ivermectin. Along with therapeutic treatments, supportive treatment using multivitamins could step forward to improve the overall recovery of rabbits in mites infestation (Kumar *et al.*, 2018). Some vitamins such as vitamins E, D3, A, and H act as antioxidants and enhance the recovery of *Psoroptes cuniculi* infested rabbits (Singh *et al.*, 2012). To control the mite's infestation in rabbit population, some measures have been applied including anti-parasitic and acaricides drugs, hygiene conditions, use of some natural acaricidal products, and vaccines (George *et al.*, 2014). Additionally, regular disinfection of rabbit cages and their surroundings is very important step in effective control of mange (Darzi *et al.*, 2007).

CONCLUSION

Mites are common problem in rabbit population which results in inappetance, itching and weight loss. Among mites, *Sarcoptes scabiei* is more common than *Demodex cuniculi*. Multiple skin lesions are observed in affected animal including pruritis, seborrhea, alopecia, hypersensitivity reaction, crusting and hyperkeratosis all over the body including face, ears, around nose, neck, limbs and back region of body. Animal showed clinical signs like alopecia, pruritus, itching and dry crusty lesions over the body. Ivermectin can be successively used in mange infestation in rabbits with proper dose. Along with ivermectin, supportive drugs have major role to combat secondary bacterial infection and fast recovery in rabbits.

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