EFFICACY OF IVERMECTIN AGAINST *NOTOEDRES CATI VAR CUNICULI* IN NEW ZEALAND WHITE RABBITS

Sanku Borkataki[1], Saidul islam and Pankaj Goswami
Division of Veterinary Parasitology, Faculty of Veterinary Sciences and Animal Husbandry
Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura-181 102, Jammu and Kashmir, India

Received on: 18.01.2018
Accepted on: 26.04.2018

ABSTRACT

Clinical efficacy of ivermectin in New Zealand White rabbits naturally infested with *Notoedres cati* var *cuniculi* has been described in this communication. Two rabbits exhibited severe infestation affecting both sides of the ear, surrounding the nostrils and eyelids, including phalanges of all with intense irritation by the mites and resultant scratch. A single subcutaneous dose of 400 µg per kg body weight showed improvement of clinical conditions from 7th day of treatment. Blood eosinophil count (%) and mite count per 100 mg of skin material decreased from 15.25% and 2422.50 on 0 day of treatment to 9.64% and 596.50 on 7th day treatment, respectively. Average body weight was increased from 1.22 kg to 1.32 kg on 7th day post treatment. Thereafter mite count fell on 9th and 21st day of post treatment with complete disappearance from the skin lesions with growth of new hairs. The dose rate of ivermectin did not adversely affect the clinical health of the animal and was found to be suitable against natural *Notoedres cati* var *cuniculi* infestation in NZW rabbits.

Key words: Ivermectin, *Notordes cati*, rabbit

Introduction

Notoedric mange is caused by burrowing mite *Notoedres cati var cuniculi* in rabbit reported sporadically. This mange mite infestation is worldwide in distribution and lesions are initially seen on the nose and lips, before extending to involve the rest of the face. Burrowing mite also having zoonotic importance, it causes transient itching dermatitis in human being. This mite rapidly spread from one to another by direct contact of skin or from environment (Panigrahi *et al*., 2016) and infect a lot within a short period of time. Male adult and older larvae they remain on the surface of the skin and only adult female will dig in to the skin and form a tunnel, where they lay the eggs. To complete the life cycle from eggs to adult, it takes 2 to 3 weeks of time. This mite causes intense pruritis with associated with self-inflicted scratches which may be severe and lead to secondary pyoderma and becomes a serious menace in rabbit colonies unless adequate measures are taken to control it. Application of topical medicine to remove the mite infestation is difficult but ivermectin is easy to administer and helpful in eliminate out the mite infestation from the skin (McKeller *et al.*, 1992). The present study recorded the occurrence and efficacy of ivermectin against *Notoedres cati var cuniculi* in rabbits.

Materials and Methods

Five New Zealand White rabbits of the Department of Parasitology, C.V.Sc., Khanapara were severely infected with mange mite infestation. On the basis of clinical symptoms, deep skin scrapping was taken from the affected areas using sterilized blade. Collected skin samples were dissolved in 5 ml of 10% KOH and heated it till dissolved the debrises. After centrifugation, sediments were observed under low and high power microscope for presence of mite. The morphological identification of mite was done by description given by Soulsby (1982) and Muller *et al*. (1983). The affected rabbits were treated with a single subcutaneous dose of ivermectin at @ 400 µg/kg bodyweight and clinical parameters were evaluated accordingly. The parasitological as-well-as clinical and blood eosinophil counts were conducted on 0 (prior to treatment), 7th and 21stday post treatment. Hundred milligram of skin scrapping materials were taken for counting of mites. Average bodyweight of the rabbits were also recorded.

Results and Discussion

Clinical signs

Five New Zealand White rabbits of both sexes ranging from the age group of 10-14 months with an average bodyweight of 1.22 kg showed severe mange mite infestation. The lesions started in the ear, surrounding the nostrils and eyelids including phalanges of all and later surrounded the whole faces of all animals including ear pinnae and eyelids. The affected areas showed alopecia and scab formation due to watery discharged from the wound. Rabbits were suffering from severe pruritis and due to scratching there was formation of haemorrhagic crusts. Kachhawa *et al.* (2013) recorded clinical signs in rabbits in scabies includes, ruffled body coat, crustaceous lesions on head, ear pinna, legs, around genitalia and over dorsal surface with brownish discharge. Skin scrappings were examined for presence and identification of the mange mite from the infected areas and which was identified as *Notoedres cati var cuniculi* (Soulsby, 1982; Muller *et al*., 1983).

Clinical and parasitological examination with treatment

On zero day, prior to treatment an average eosinophil counts (%) and mite counts per 100 mg of skin scrapping was found 15.25 and 2422.50 mites, respectively. Rabbits were treated with a single subcutaneous dose of ivermectin @ 400µg/kg bodyweight. On 7th day post treatment, average eosinophil counts (%) and mite counts were found to be 9.64 and 596.50 mites, respectively and clinically rabbits recovered faster. Average bodyweight of the rabbits were also increased

[1]Corresponding author and Assistant Professor (S. Scale) Division of Veterinary Parasitology, Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-Jammu, R.S. Pura, Jammu and Kashmir, E mail: borkataki_sanku@rediffmail.com

from 1.22 kg to 1.32 kg. Thereafter mite counts fell on 9th and on 21st day post treatment with complete disappearance of clinical signs from skin with growth of new hairs. The dose rate of ivermectin did not adversely affect the clinical health of the rabbits. The present study recorded decreasing order of mite counts with single dose of ivermectin with complete disappearance of mite from 9th days post treatment. The hatching time for *Notoedres* spp. is usually 4-5 days (Gordon *et al.,* 1943).The reduction and disappearance of mite from 9th days after indicates that sufficient concentrations drug is available to give it efficacy to kill any larvae hatched out from egg. This finding is are in accordance with earlier work (Singla *et al*., 1996), where complete visual shedding of lesion and mites were disappear from 7th day to till 30th day of post treatment with similar dose rate of ivermectin. Singari *et al*. (2001) found a single dose of doramectin @ 400µg along with the supportive treatment of antihistaminic for three days against notoedric mange in rabbits was 100% effective, whereas Aulakh *et al*. (2003) reported subcutaneous injection of same drug @ 200 µg/kg body weight once a week for two weeks was effective for the same type of mange. Darzi *et al*. (2007) used a single intra muscular injection of doramectin @400 µg/kg bodyweight against sarcoptic and notoedric acariosis in rabbits results in decreased the mites and their developmental stages with nil concentration of mite in skin scrappings by 10th day of post treatment. Kachhawa *et al.* (2013) given injection ivermectin to *Sarcoptes scabiei* affected rabbits subcutaneous @ 400 µg/ kg body weight every 7th day on three occasions and found recovery after four weeks. Panigrahi *et al*. (2016) used ivermectin @ 400 µg/kg body weight, subcutaneously at weekly intervals for four weeks in rabbits infected with mixed infestation of *Sarcoptes*, *Psoroptes* and *Notoedres* mites that resulted in remission of clinical signs and improvement of health condition in rabbits after 2 week post treatment with absence of mites in the skin scrappings examination. Clinically, a significant improvement was noted from 7th day and rabbits recovered completely within 3 to 4 weeks. The present outbreak was observed during April to June. At this time due to unusual rainfall and fluctuation in the environmental temperature and high relative humidity might play an important role in occurrence of mite infestation in rabbits. Similar observation was found by Zeleke and Bekele (2001) in camels.

Above results indicate that since this mite spread rapidly from infected to non-infected one, it can be effectively controlled by using single subcutaneous injection of ivermectin @ 400 µg/Kg body weight with complete clinical recovery within a week.

References

Aulakh GS, Singh S, Singla LD and Singla N (2003) Pathology and therapy of natural notoedric acariosis in rabbits. *J. Vet. Parasitol*. **17**:127-129.

Darzi MM, Mir MS, Shahardar RA and Pandit BA (2007) Clinicopathological, histochemical and therapeutic studies on concurrent sarcoptic and notoedric ascariosis in rabbits (*Oryctolagus cuniculus*) *Vet. Arhiv*. **77**(2):167-175.

Gordon RM, Unsworth K and Seaton DR (1943) The development and transmission of scabies as studies in rodent infections. *Annals Trop. Med. Parasitol*. **37**:174-184.

Kachhawa JP, Kachhawa S, Srivastava M, Chahar A, Singh NK (2013) Therapeutic management in rabbits. *Intas Polivet* **14**(11): 306-308.

McKellar QA, MidgleyDM, Galbraith EA, Scott EW and Bradley A (1992) Clinical and Pharmacological properties of ivermectin in rabbits and guinea pigs. *Vet. Rec.* **130:** 71-73.

Muller GH, Kirk FW and Scot DW (1983) Small animal dermatology, 3rd ed., WB Saunders, Co, Philadelphia, 331-352.

Panigrahi PN, Mohanty BN, Gupta AR, Patra RC and Dey S (2016) Concurrent infestation of *Notoedres*, *Sarcoptic* and *Psoroptic* acariosis in rabbit and its management. *J. Parasit. Dis.* **40**(3):1091-1093.

Singari NA, Kasaralikar VR, Shobhamani B and Choudhuri PC (2001) Notoedric mange in rabbits and its treatment with doramectin. *J. Vet. Parasitol*. **15**:77-78.

Singla LD, Juyal PD and Gupta PP (1996) Therapeutic trial of ivermectinagainst *Notoedres cati* var. cuniculi infection in rabbits. *Parasit*. **3**(1):87-9.

Soulsby EJL (1982) *Helminths,Arthropods and Protozoa of domesticated animals*. 7th ed. ELBS, London, U.K.p.486.

Zeleke M and Bekele T (2001) Effect of season on the productivity of camels (*Camelus dromedarius*) and the prevalence of their major parasites in eastern Ethiopia. *Trop. Anim. Hlth. Prod.* **33**:321-329.