



SHORT COMMUNICATION

Therapeutic Potential of Ivermectin, Doramectin and Trichlorophan against *Psoroptes ovis* in Sheep and Cattle of Cholistan

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ABSTRACT

This paper describes case of psoroptic mange in a herd consisting of 45 sheep and 15 cattle. Single species of mite, *Psoroptes ovis*, was identified in superficial skin scrapings, treated with 10% KOH, of all sheep and cattle. For treatment purpose, affected animals were placed in four groups (three sheep groups each having 15 sheep and fourth one consisting of 15 cattle) and control group consisted of 15 healthy animals. Two doses of Doramectin, Ivermectin, Trichlorofan and Ivermectin were injected/poured on at 14 days interval. Significantly different mean recovery response was measured in groups (2 and 4) treated with ivermectin from all others at 7th day after treatment ($P < 0.05$). All members of groups 2 and 4 were recovered completely at day 14 post-treatment and clinical signs were diminished. It was concluded that ivermectin is quite effective for treatment of Psoroptic mange in sheep and cattle as well.

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INTRODUCTION

Arid and hot climate of Cholistan desert, near to Bahawalpur (Punjab-Pakistan), provide favorable conditions for ectoparasites in the local heads of livestock (Farooq *et al.*, 2008). *Psoroptes (P.) ovis*, a skin dwelling, non-burrowing mite, is economically important causing intense pruritus, yellow crusts on the skin and characterized by scratching, restlessness, chronic dermatitis, head tossing, lichenification and anemia in sheep (Taylor *et al.*, 2015). These conditions lead to weight loss, lower milk production and conception rate, increase susceptibility for secondary bacterial infection (Gurbuz *et al.*, 2013) and ultimately, major economic losses in livestock sector (Mounsey *et al.*, 2012). Sheep is the primary host of *P. ovis*, nevertheless, cattle can also be infected. Use of acaricides is desperate for profitable animal business. Pyrethroids, organo-phosphorus and macrocyclic lactones are shields as control and treatment of this mite. Macrocyclic lactones like ivermectin, doramectin and moxidectin are more recent and also available in injectable forms. However, as a rule, prolong and

indiscriminate use of same chemical eventually gives birth to resistant strains of the parasites, including *P. ovis*. This study was designed to evaluate the efficacy of various forms of ivermectin against *P. ovis* in naturally infected sheep and cattle belonged to Cholistan desert.

MATERIALS AND METHODS

History and clinical examination: A flock of 45 Cholistani (Khadali) sheep and 15 Cholistani cattle aged between 1-2 years and 4-5 years, respectively were brought to University Veterinary Hospital. Inappetence, scratching, licking at their own backs or flanks, pruritus, loss of wool, scab formation on head, neck and shoulder were the conditions recorded during clinical examination.

Skin scrapings: Both superficial and deep skin scraping were collected and examined (Fthenakis *et al.*, 2000). Multiple scrapings from edge of lesions were collected with help of scalpel blade and heated in a test tube having 5mL of distilled water and 10% KOH. The test tube having scraping was then subjected to centrifugation at 2500 rpm for 10 minutes. Supernatant was discarded and

sediment was examined under microscope and mites were identified with the help of morphological keys (Taylor *et al.*, 2015).

Treatment: For treatment purpose, affected animals were placed in four groups (three sheep groups each having 15 sheep and fourth one consisting of 15 cattle) and control group consisted of 15 healthy animals (10 sheep and 5 cattle). At the start of experiment, quality of lesions of each animal and mean lesion quality of each group was recorded using clinical scores 1-4 (Table 1). Recovery response in each animal and mean recovery response of all groups against all respective treatments was determined by grading from 0-4 (Table 1). All the members of first group were injected with two doses of Doramectin 1% (Dectomax® Pfizer) @ 300µg/kg BW subcutaneously with an interval of 14 days. Two doses of Ivermectin (Actimec Plus® Selmore, Pakistan) with an interval of 14 days were injected to all members of second and fourth group @ 200 µg/kg BW subcutaneously. The members of third group were given bath with single dose of 0.5% solution of Trichlorophone (Ectofone® Selmore, Pakistan). Control group was provided same management but received no treatment. The efficacy of each drug was evaluated on the basis of percent reduction in mite number and mean recovery response on day zero of treatment and on days 7, 14, 21 and 28 post-treatment. At the end of experiment, skin scrapings were collected and examined for presence of any mite. Data were analyzed by using one-way ANOVA and means were compared by Tuckey's test on SPSS software.

RESULTS AND DISCUSSION

Skin scraping examination revealed that all the animals were infected with single species of mite. Species of mite was identified as *Psoroptes ovis*. Tasawar *et al.* (2007) recorded that 14% of sheep population of Multan district was infected with *Psoroptes ovis*. Aatish *et al.* (2007) identified *Sarcoptes scabiei var. ovis* during a survey of sheep population in district Dera Ghazi Khan. Samples of mites collected from sheep and cattle were phenotypically similar. Host specificity of different isolates of *P. ovis* is controversial. Losson (2012) reviewed research findings of various scientists on *Psoroptes* collected from different host species and concluded that *Psoroptes* mites collected from different host species exhibit minor differences in antigenic profile. Little is known about epidemiology of Psoroptic mange in Pakistan. So, it is need of time to perform a detail study on epidemiology of psoroptic mange in Pakistan as accurate information on epidemiology of a disease is of

paramount importance to launch a successful eradication program.

Clinically, mange in sheep and cattle showed varying degrees of inappetence, loss of wool, scratching, biting, licking at their own backs or flanks, pruritus and scab formation on head, neck, shoulder and rump. After treatment of affected animals with three acaricidal drugs, retrieval of clinical signs was observed and recorded. At start of experiment (day 0), skin lesions in affected animals were given score. After analysis of data at the end of experiment, it was found that there is no statistically significant difference in mean lesion quality of all groups except control group (Table 2). Significantly different mean recovery response was measured in groups 2 and 4 from that of group 1 and 3 at 7th day after treatment ($P<0.05$) (Table 2). All members of group 2 and 4 were recovered completely at day 14 post-treatment and clinical signs were diminished. At day 28 post-treatment, members of all groups were recovered and clinical signs were diminished.

Table 1: Grade scoring of mean lesion quality and mean recovery response

	Grade scores
Description of lesions	
Reddening of skin	1
Bare, exposed, moist lesions with serious exudation	2
Dry lesions with scab formation and loss of hairs	3
Thick, wrinkled skin with hyperkeratinization	4
Description of recovery	
No response	0
Dryness of lesions and loss of itching	1
Start of shrinkage of lesions and hair growth	2
Marked hair growth with smooth skin surface	3
Complete recovery	4

In the present study, no mite was observed during skin examination at day 28 post-treatment. Jaiswal *et al.* (2014) injected ivermectin, to cattle infested with *Psoroptes*, @ 0.3mg/kg BW thrice at an interval of one week and observed no adult or nymphal stages at day 21 of treatment. In a clinical trial, Sabry *et al.* (2009) concluded that number of clinical cases recovered in groups injected with moxidectin and doramectin were significantly higher than those in group injected with ivermectin. In present study, it was observed that ivermectin is quite effective for treatment of Psoroptic mange in sheep and cattle as well.

Authors contribution: TUR, MAZ and MNK conceived the idea and designed the experiment. TUR, RZA, WB, MTR and TG executed the trial. TUR, MAZ and MA prepared the manuscript. RH analyzed the data and all authors approved the manuscript.

Table 2: Comparison of lesion quality and recovery response between different treated groups

Treatment	Animal	Lesions quality score at Day 0 (Mean±SD)	Recovery response			
			Day 7	Day 14	Day 21	Day 28
Doramectin	Sheep	3.20±0.41b	2.60±0.63b	3.47±0.52b	3.80±0.41abc	4.00±0.00
Ivermectin	Sheep	3.27±0.46b	3.27±0.46a	3.90±0.00ac	4.00±0.00 ac	4.00±0.00
Trichlorophone	Sheep	3.20±0.56b	2.67±0.62b	3.27±0.70b	3.67±0.49b	4.00±0.00
Ivermectin	Cattle	3.13±0.74b	3.33±0.49a	3.92±0.00ac	4.00±0.00ac	4.00±0.00
Control (-)		0.00±0.00a	4.00±0.00c	4.00±0.00c	4.00±0.00c	4.00±0.00

Values (mean±SD) bearing alphabets in a column differ significantly ($P<0.05$).

REFERENCES

- Aatish HU, Sindhu ZD, Iqbal Z, et al., 2007. Prevalence of sheep mange in district Dera Ghazi Khan (Pakistan) and associated hematological/biochemical disturbances. *Int J Agric Biol* 9:917-20.
- Farooq Z, Iqbal Z, Mushtaq S, et al., 2008. Ethnoveterinary practices for the treatment of parasitic diseases in livestock in Cholistan desert (Pakistan). *J Ethnopharmacol* 118:213-9.
- Fthenakis GC, Papadopoulos E, Himonas C, et al., 2000. Efficacy of moxidectin against sarcoptic mange and effects on milk yield of ewes and growth of lambs. *Vet Parasitol* 87:207-16.
- Gurbuz G and Kiziltepe S, 2013. Alterations in haematological and biochemical parameters in Morkaraman sheep with natural *Psoroptes ovis* infestation. *Kafkas Univ Vet Fak Derg* 19:975-8.
- Jaiswal AK, Sudan V, Singh AK, et al., 2014. Concurrent *Demodex* spp. and *Psoroptes* spp. mite infestation in an indigenous cattle: a case report. *J Vet Adv* 4:664-7.
- Losson BJ, 2012. Sheep psoroptic mange: an update. *Vet Parasitol* 189:39-43.
- Mounsey KE, Willis C, Burgess ST, et al., 2012. Quantitative PCR-based genome size estimation of the astigmatid mites *Sarcoptes scabiei*, *Psoroptes ovis* and *Dermatophagoides pteronyssinus*. *Parasite Vectors* 5: 3.
- Sabry A, El-Khodery IM, Salama AO, et al., 2009. Comparative therapeutic effect of moxidectin doramectin and ivermectin on psoroptes mites infestation in buffalo (*Bubalus bubalis*). *Trop Anim Health Prod* 41:1505-11.
- Tasawar Z, Rauf B, Hayat CS, et al., 2007. Prevalence of *Psoroptes ovis* in sheep around Multan Pakistan. *Pak Vet J* 27:199-200.
- Taylor MA, Coop RL and Wall RL (eds) 2015. *Front Matter in Veterinary Parasitology* 4th Ed; John Wiley & Sons Inc. Hoboken NJ USA.