PREVALENCE OF ECTO PARASITES AND COMPARATIVE EFFICACY OF DIFFERENT DRUGS AGAINST TICK INFESTATION IN CATTLE

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ABSTRACT

The present study was designed to find out the prevalence of ecto-parasites and to evaluate and compare the efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) leaves against tick infestation in cattle. For this purpose a total of 300 cattle were examined for the prevalence of ecto-parasites in and around Dera Ghazi Khan (Pakistan). The prevalence of ticks, mites and lice was found to be 108 (36%), 15 (5%) and 24 (8%), respectively. The main species of ecto-parasites observed were *Boophilus microplus, Boophilus annulatus, Hyalomma aegyptium, Psorcoptes bovis, Sarcoptes Scabies var bovis, Haematopinus tuberculates and Linognathus vituli.* The efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) against ecto parasites was 100%, 60% and 0%, respectively. From this study it was concluded that ivermectin is drug of choice against ecto-parasites of cattle.

Key words: Ivermectin; Doramectin; *Azadirachta indica*; Prevalence; Ecto-parasites.

INTRODUCTION

Pakistan is blessed with a large population (29.56 million) of cattle (Anonymous 2007). These animals are playing a vital role in fulfilling the ever increasing demand for animal protein and milk for mankind and also draft power for agriculture in the country. Parasitic infestation especially ecto-parasites are the major veterinary problem in most of the developing and under developed countries of the world. The health and production in animals is severely affected by diseases caused by ecto-parasites including ticks, flies, lice, fleas and mange mites. The characteristic symptoms are local itchiness, loss of hair, and other production losses. These parasites suck blood and tissue fluid and are also responsible for the transmission of various diseases like piroplasmosis, theileriosis, anaplasmosis and many viral diseases, causing heavy economical losses (Hourrigan, 1979). In neglected and untreated animals death could occur (Manurung *et al.*, 1986). The increased incidence of various ecto-parasitic infections including the infestation of different species of mites may be due to a number of factors like poor management, imbalanced nutrition and poor sanitary conditions of the animal housing place. Keeping in view the clinico-economic importance of ecto-parasites, the present study was designed to find out the prevalence of various ecto-parasites and efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) leaves against ticks infestation.

MATERIALS AND METHODS

A total of 300 cattle irrespective of their age, sex and breed were surveyed and examined for the presence of ecto-parasites in and around Dera Ghazi Khan (Pakistan).

Tick Collection: Adult ticks and the ticks in various developmental stages were collected from infested animals without damaging their mouth parts with hand firmly, or lightly by using forceps. The ticks collected were put into glass bottles containing 70% alcohol with 5% glycerol for preservation.

Collection of Samples for Mites: Cattle were thoroughly examined for the presence of ecto-parasite lesions especially on the neck, head, back around the tail and sides of the body. For the confirmation of mites, the skin scrapings were collected in a petri plate from the margins of lesions after clipping and cleaning the areas. The skin scrapings were treated with 10% potassium hydroxide (KOH) or 10% sodium hydrodixe (NaOH) solution to dissolve the debris. The supernatant was discarded and the sediment was examined under the microscope.

Examination of Samples: For the identification and confirmation of ecto-parasites the samples of ticks, mites and lice were examined under low power and then high power magnification of microscope. Diagnosis of different types of ecto-parasites was accomplished with the help of morphological characteristics of each parasite as described by Soulsby (1982).

Animals used: The animals found positive for ticks infestation were tagged for identification. Of these 40 animals were selected for therapeutic trials. These were

randomly divided into four groups i.e. A, B, C and D. Animals in groups A, B and C were treated with Ivermectin 1% (Ivomec), doramectin 1% (Dectomax) and *Azadirachta indica* (neem) leave, respectively. Whereas 10 animals in group D found positive were served as control and no treatment was given to this group. In addition to that 10 healthy animals were also included (group E) as negative (healthy) control.

Drugs used: the following drugs were tried.

- Ivermectin (Ivomec) - a product of Marial Private Limited given subcutaneusly at the rate of 0.2 mg/Kg body weight.
- Doramectin (Dectomax) – a product of Pfizer, Limited, Pakistan given subcutaneously at the rate of 0.2 mg/Kg body weight.
- *Azadirachta indica* (neem) dry leave in powder form given at the rate of 40 gm per 100Kg body weight soaked in 3-4 liters of water for 48 hours then applied topically.

The percent efficacy of ivermectin, doramectin and neem was calculated at day 7 and 14 by using following formula.

$$(\%)\ \text{efficacy} = \frac{\text{No. of animals Cured}}{\text{No. of Animals treated}} \times 100$$

RESULTS AND DISCUSSION

The prevalence of tick infestation was reported to be 108(36%) out of 300 animals included in the study. The ticks belonging to species *Boophilus microplus*, *Boophilus annulatus,* and *Hyalomma aegyptium* were identified. Out of 300 surveyed animals, 24 (8%) were positive for mites belonging to *Psorcoptes bovis*, and *Sarcoptes scabies vor bovis* whereas 15 (5%) were found positive for lice infestation. The most common species of lice were found to be *Haematopinus tuberculates and Linognathus vituli.* Various workers like Chaudhry (1965), Hiregoular and Harlapur (1988) and Khan *et al.* (1993) reported the prevalence of tick infestation in cattle was 28.2, 22.6 and 39.2 percent, respectively. Their findings are closely related to the results of present study. Ali (1988) reported prevalence of mites (9%) which is also in close agreement with findings of the present study. Joseph *et. al*. (1986), Nelson and Howard (1986) and Munoz *et. al*. (1987) reported prevalence of lice (6%) which is also closely related to the findings of the present study.

In this study the efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) was found to be 100%, 60% and 0%, at day 14 (post-medication), respectively. Campbell *et. al.,* (1983) reported the biochemistry structure, mode of action and safety of ivermectin in detail. It was observed in the present study that ivermectin was the most effective and safest drug against ectoparasites in cattle at a dose rate of 0.2 mg/kg body weight.

Table – 1: Prevalence of ecto-parasite in cattle in and around Dera Ghazi Khan.

Type of ectoparasite	No. of animals infested	Percent infection
Ticks	108	36%
Mites	24	8%
Lice	15	5%
No parasite	153	51%

Table- 2: Comparative efficacy of ivermectin, doramectin and *Azadirachta indica* (neem) leave against ticks infestation in cattle

Group n=10	Drugs used	Efficacy (%) of drug at day 7	14
A	Ivermectin	60	100
B	Doramectin	40	60
C	*Azadirachta indica* (neem)	0	0
D	Control positive	—	—
E	Control negative	—	—

The same dose was administered by Pouplard and Detry (1982) and Leaning (1984) who reported that successfull treatment was done for ecto-parasites in cattle. Magnano (1983), Empel and Koanacki (1990), and Kutzer *et. al.* (1990) further recorded that a single subcutaneous injection of ivermectin was sufficient for the complete cure against ecto-parasites. Skosyrskikh (1987) stated that mange mites could be treated by single s/c injection of ivermectin for complete cure. Results of the present study are also in close agreement with results of Said (1969).In the present study, untreated group of animals did not show any spontaneous recovery. These observations are in accordance with the study of Manurung *et. al.* (1986) who reported similar findings in untreated animals.

From the present study it was concluded that ivermectin (Ivomec-Merial, Pvt. Pakistan), @ 0.2 mg/kg body weight subcutaneously is the drug of choice for the treatment of tick infestation in cattle.

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