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SOME STUDIES ON NATURALLY AND EXPERIMENTALLY INFECTED ANIMALS WITH SARCOPTIC MITE IN SAUDI ARABIA

(With 2 Table and 4 Figures)

By

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بعض الدراسات في الحيوانات المصابة بطفيل جرب الساركوبتي
وأخرى مصابة بعدوى تجريبية

عادل عبدالعظيم ، مجدى حافظ ، زين القواسمة ، سيد العمروسي

ثبت أن حلم الساركوبتي صنف سكايباي. قد ينتقل عن طريق المخالطة بين الأغنام
والماعز والأبقار والحمير والأبل وكانت الإعراض الاكلينيكية متشابهة في كل هذه الحيوانات
ويستطيع الحلم أن يعيش بعيداً عن عائلته لمدة أيام وذلك على شعر أرناب تركت في
حظائر كانت بها حيوانات مصابة وأن عقار الأيفوسك بالجرعات العلاجية يعطي شفاءاً
ظاهرياً ويمكن أن يخلق عدوى خفيفة.

SUMMARY

Sarcoptic scabiei mite proved to be transmitted by contact between sheep, goats, cattle, donkeys and camels. The clinical picture was similar in these species. Fomites can harbour the mite for 5 days as observed from rabbits left on infected pens.

Ivermectin in the recommended doses produced clinical recovery but it may initiate carrier problems.

INTRODUCTION

Mange is a highly contagious and debilitating skin disease. Sarcoptic scabiei parasitizes domestic and wild animals. It was currently reported that mites from various species of hosts are similar but are usually regarded as different biological races or species (BLOOD *et al.*, 1979). Reports pointed out also that Sarcoptic scabiei is not entirely host specific and it can be experimentally transferred between different hosts including man.

The aim of the present investigation is to determine the host range of *Sarcoptic scabiei* var *ovis* under natural conditions of contact. The viability of the mite in animal houses will also be considered. A part of the study will deal with efficacy of Ivermectin as a therapeutic agent.

MATERIAL and METHODS

Animals: Two naturally infested Najdi sheep.
Four apparently healthy Najdi sheep.
Four camels (Local breed)
One calf and one donkey.
Ten Rabbits.

Infection: Infested animals were kept together with apparently mange free ones.

Methods of Examination: Skin scrapings from the developed lesions were collected in Petri dishes. Examination for mites and eggs was carried out as described by MARHARET and RUSSEL (1984). Samples not containing intact mites or eggs were considered negative. Identification of the parasite was performed according to the method described by MARHARET and RUSSEL (1984). To cover this work four steps were designed (Table 1).

STEP I :

Two adult ewes, admitted to the veterinary teaching hospital suffering from extensive dermatitis together with severe itching, were examined for live mites infestation. Both proved to be severely infested with *Sarcoptic scabiei* var. *ovis* mite (Fig. 1).

Four healthy ewes 2-3 Yrs. old weighing 50 Kg each were obtained from the experimental station of King Faisal University with no history of mange. Animals were subjected to thorough clinical examination and laboratory investigations. Animals were housed together with the two infected ewes in a pen and all were put under a high plane of nutrition. Clinical examination of all animals was undertaken every 5 days as well as skin scrapings were collected from the developing lesions and subjected to parasitological examinations. Measurements of adult males, females, larvae, nymph and eggs were done.

RESULTS

The four healthy sheep showed shedding of wool estimated about 30% of the body surface together with itching (Fig. 4). These signs appeared after 4 weeks contact with the two naturally mange infested ewes. Lesions appeared around the eyes, lips then extended to face and ears (Fig. 2). Skin scrapings were positive for *Sarcoptic scabiei*. Average dimensions of the parasite are shown in (Table 2). No obvious changes in the measurements of the mean dimensions between the naturally- and experimentally - infested sheep.

SARCOPTIC MITE IN SAUDI ARABIA

STEP II :

Field trials : The whole members of step I (6 animals) were treated by inoculating (s/c) each with 1.0 ml Ivomec - sterile solution of 1% w/v ivermectin - [MSD] and the same dose was repeated after 3 weeks. Thirty days post treatment skin biopsies were collected at random from 2 sheep and subjected to histological examination.

Other 2 sheep, which were kept under strictly quarantine, were housed in a new previously cleaned pen with a clinically healthy goat and a calf. These were clinically mange free where both were put under clinical observation for one month in a clean pen during which no signs of mange were observed.

The rest 2 of the treated group were housed together with a healthy donkey clinically mange free.

Treated infested sheep responded to Ivomec where lesions disappeared and no itching was observed, growth of hair took place and no clinical signs of dermatitis were observed. However, the donkey contracted infection 21 days post contact with those Ivomec treated sheep. Lesions appeared as shown in (Fig. 3). The goat and calf contracted also the disease, however, the goat and one of the treated sheep died 20 and 30 days respectively post infection. The goat showed chronic mange dermatitis and developed abscesses under the skin and in lung tissue (PM) were seen, in addition, in the sheep.

It is worthy to mention in this step of the experiment that the number of the parasite/gram was evidently decreased after treatment from 600 to 40. The same for eggs, larvae and nymphs decreased after treatment.

STEP III :

The infected donkey in step II was treated with invomec as described before. Fourteen days post-treatment the donkey was housed together with a four male camels, 5-6 Yrs. old, in an open yard previously sprayed with an insecticide several times. Camels were clinically mange free and were put under clinical examination for everBu days and lasted a month.

Skin lesions on camels appeared within 45 days post contact on the face and spread on the neck and the body together with the general signs of mange. Skin scrapings from the developed lesions revealed the presence of Sarcoptic scabiei living mite. One can conclude from this experiment that the donkey can still harbour the parasite and could infest new host.

STEP IV :

The viability and infectivity of sarcoptic mites in pens were tested. This was achieved by 30 days housing of 10 clinically healthy rabbits, obtained from the Lab animal house of the teaching hospital, in a clean pen previously sprayed with acaricide [Diazinon]. These pens were housed by the infected sheep. Every 5 days rabbits were

A.A. FAYED et al.

clinically examined; skin scrapings were collected from different areas of body surface and subjected to microscopical examination for mites.

The rabbits were infested with the mites which were detected on the hair of rabbits 5 days post housing in the respective infected pens. The parasite could infest the rabbits where it was found on the hair and on the superficial layers of the skin without causing clinical dermatitis.

DISCUSSION

The results point out that Sarcoptic scabiei is not entirely host specific with the exception of rabbits as transmission from one species to another occurred. The lesions in experimentally infested animals were rather similar as those observed on naturally infested ones either in distribution or severity. Similar observations were noticed by ABU SAMRA (1986). Moreover, the appearance of clinical dermatitis appeared clearly after 30 days post infestation in sheep, whereas in camels this was rather variable and the appearance was within 45 days after contact.

The results showed also that Ivomec could not eliminate totally the parasite. Similar clinical response to the drug was reported by MELENEY (1982) and YARUHAM et al. (1982) in cattle and sheep respectively. Both reports pointed out that the clinical response was either slow or not sufficient following treatment of psoroptic mange; unlike the traditional acaricides which was immediately effective. However, IBRAHIM et al. (1981) reported very encouraging data that a single dose of Ivermectin when given at a dose rate of 1.0 ml 50 Kg bwt was effective in controlling sarcoptic mange in Egyptian camels.

Concerning the viability of mites reported SOULSBY (1982) that bedding and other inert materials do not support the mite more than few days. They should be treated unless they can be left in a dry state for 3 weeks.

Our opinion about the efficacy of Ivomec, reported by some authors in the middle east area, may create some confusion about success of the drug in the treatment of mange. There is a belief of some veterinarians that the drug is 100% effective, depending only on clinical signs, will result in the presence of carriers. However, the current literature is clear that the drug is highly effective on the internal parasites additional data is recorded in the scientific informations provided by the producer.

The possible hazard effect of the residues in the tissues of animals after slaughter needs further control study about its elimination after treatment.

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SARCOPTIC MITE IN SAUDI ARABIA

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Table (I): Experimental Infestation Scheme

Origin: " naturally infested <u>two</u> sheep		
Step I. The above 2 + 4 clinically mange free = 6 sheep		
Step II. <div style="text-align: center;">↓</div>		
2+ one donkey	2+ One calf+one goat	2 for hist- logical exam
Step III	Donkey was housed with 4 camels → developed lesions within 45 days	
Step IV	Viability of mites 10 rabbits → housed in a previously infected pen	

Table (2): Mean measurements of *Sarcoptic scabiei* var *ovis*
collected from naturally and experimentally infested
sheep in μm

R A N G E	I N F E S T	Female		Male		Larva		Nymph		Egg	
		L	W	L	W	L	W	L	W	L	W
M I N	N	310	252	224	159	154	112	203	170	154	77
	X	336	252	217	154	161	112	210	140	161	77
M A X	N	440	376	310	245	252	168	274	201	196	112
	X	420	336	280	231	245	168	266	210	210	126
M E A N	N	376.4	297.9	260.7	190.2	194.2	134.5	240.8	190.9	157.6	86.6
	X	360.9	288.4	262.1	213.1	183.4	142.4	243.6	178.1	172.7	96.9

N= Naturally infested

X= Experimentally infested

L= length

W= Width

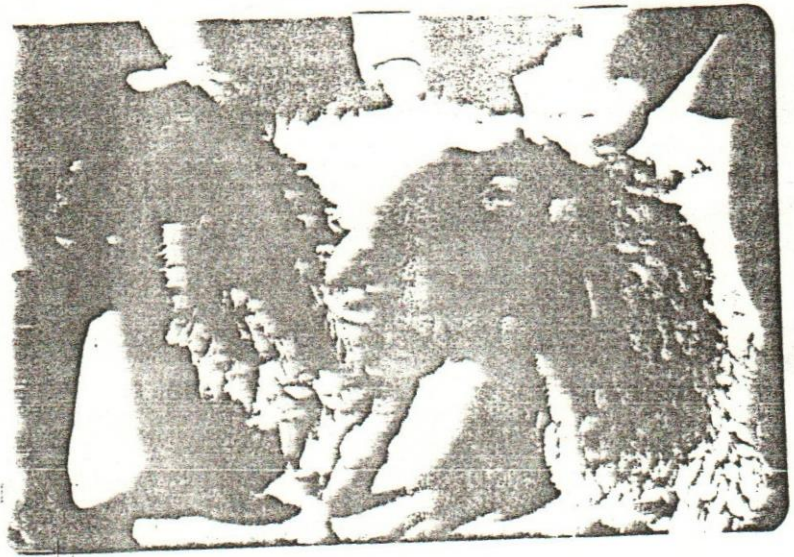
INFST = Infestation

SARCOPTIC MITE IN SAUDI ARABIA

Fig. (1)



Fig. (2)



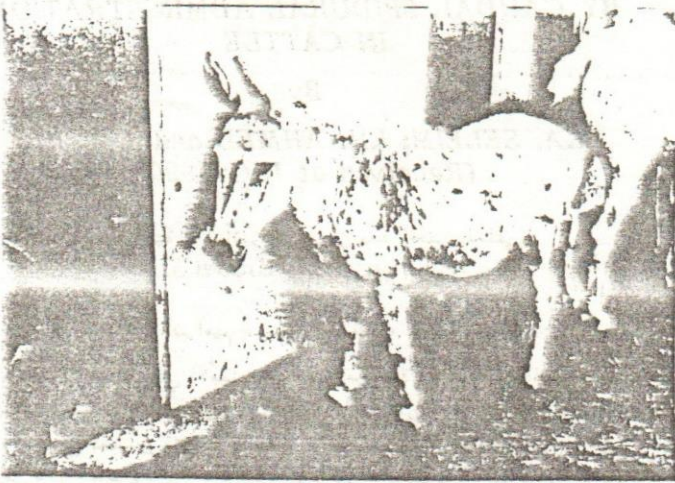


Fig. (3)

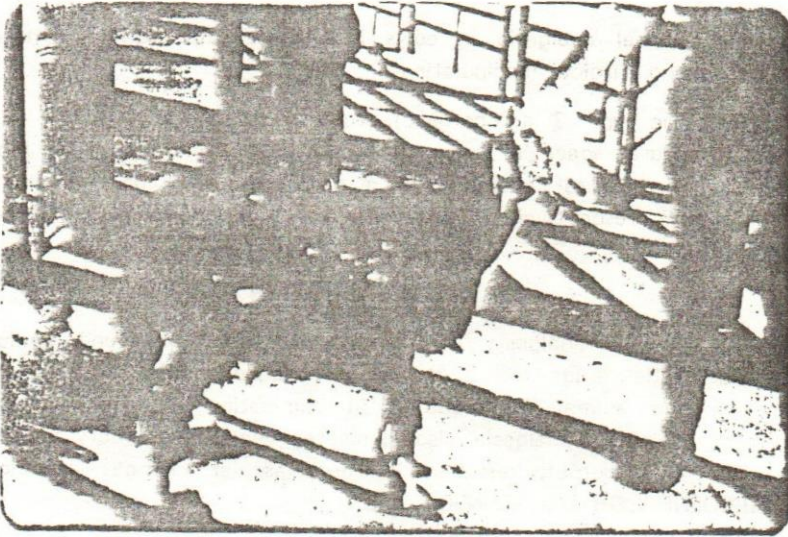


Fig. (4)