

CLINICO-PATHOLOGICAL AND THERAPEUTIC STUDIES ON NATURAL PSOROPTIC ACARIOSIS IN RABBITS

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ABSTRACT

The clinico-pathological and therapeutic studies on a natural outbreak of psoroptic acariosis in 10 New Zealand White rabbits of either sex and aged between 1 to 2 years were carried out during the period from July to December 2003. The diagnosis was made on the basis of clinical signs and examination of skin scrapings. Clinical signs recorded were severe itching and crust formation on ears, forehead, face, eyelids, forelimbs and back. Level of Hb, TEC, lymphocyte count, total protein and albumin were significantly ($p < 0.05$) low while TLC, neutrophil and eosinophil counts were significantly ($p < 0.05$) high in affected rabbits. The disease was effectively controlled by ivermectin (Inj. Mectin[®], Alembic) @ 200 µg per kg bwt given SC once in a week for 2 injections and lincomycin (Inj. Alincomycin[®] Vet., Alved) @ 20 mg per kg bwt given IM daily for 7 days for combating secondary bacterial infection. The complete clinical recovery and absence of mite in the skin scrapings on day 10 onwards of starting of therapy was recorded.

Key words: Rabbit, *Psoroptes cuniculi*, haematological changes, ivermectin

INTRODUCTION

In India with hot and humid climate, the incidence of skin infections specially mange among rabbits is very high (Aulakh *et al.*, 2003). Psoroptic mange, popularly known as 'ear mange' or 'ear canker' is one of the most common and costly ailments of rabbits caused by the acarine parasite *Psoroptes cuniculi* (Okerman, 1994). It leads to listlessness, anorexia, emaciation and even death (Ravindran *et al.*, 2000). Though several acaricides are usually used for the control of mite infestation in rabbits, it still remains a serious problem in intensive rabbit rearing (Cheeke *et al.*, 1982 and Khar *et al.*, 1988). Hence a study was undertaken to record the haematological (Hb, TEC, TLC and DLC) and biochemical (serum total protein, albumin, globulin and A:G ratio) changes in natural psoroptic acariosis in rabbits. The present study also evaluates the therapeutic efficacy of ivermectin against the ailment in rabbits.

MATERIALS AND METHODS

Ten adult New Zealand White rabbits (*Oryctolagus cuniculi*) of either sex and aged between 1-2 years of Laboratory Animal House, I.A.H. & V.B., Govt. of West Bengal, Kolkata showing signs of severe itching and crust formation on the ears, forehead, face, eyelids, forelimbs and back were selected for this study during the period from July to December 2003. All the rabbits were maintained on balanced diet and same managerial practice. Skin scrapings of affected rabbits were collected in 10% potassium hydroxide for diagnosis. For haemato-biochemical examination, 5 ml blood was collected (before and 14 days after treatment) from each rabbit, of which 2 ml was collected in EDTA sodium anticoagulant and 3 ml for serum separation. Blood from 6 healthy rabbits was also collected for comparison. Haemoglobin, TEC, TLC and DLC were examined as per the standard procedures (Jain, 1986).

Serum total protein, albumin, globulin and A:G ratio were estimated colorimetrically as per the standard procedures (Greenburg, 1929). On confirmation of *P. cuniculi* infestation, all the rabbits were given 2 injections of ivermectin (Inj. Mectin[®], Alembic) @ 200 µg per kg bwt given SC at weekly interval and injection lincomycin (Inj. Alincomycin[®] Vet., Alved) @ 20 mg per kg bwt given IM daily for 7 days for combating secondary bacterial infection. The rabbits were examined daily for clinical improvement. Skin scrapings were examined twice weekly for mange mites. The clinical recovery was evaluated on the basis of recovery in clinical signs (itching and scratching), lesions (stoppage of scab formation, smoothing of skin and hair growth in the affected area). Haemato-biochemical parameters were also estimated after the complete clinical recovery.

Data were analysed using Student's 't' test according to the methods of Snedecor and Cochran (1967).

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RESULTS AND DISCUSSION

The lesions were restricted on the ears, foreheads, faces, eyelids, forelimbs and back (Fig. 1). The animals became emaciated and restless. Skin scrapings revealed numerous mites (in all developmental stages), identified as *Psoroptes cuniculi* (Fig. 2) as per the key given by Soulsby (1982). The levels of Hb and TEC reduced significantly ($p < 0.05$) in all the infected rabbits as compared to the healthy control group. There was significant ($p < 0.05$) increase in TLC. Under DLC, the neutrophils and eosinophils exhibited significant ($p < 0.05$) increase while lymphocytes exhibited a significant ($p < 0.05$) decrease (Table 1).

Table 1. Haemato-biochemical changes in rabbits suffering from psoroptic acariosis

S / N	Parameters	Unit	Healthy control rabbits (n = 6)	Infested rabbits (n = 10)	
				Pre-treatment	14 days post-treatment
1.	Haemoglobin	g / dl	9.3 – 12.2 ^a 10.4 7± 1.74 ^b	6.2 – 8.5 ^a *7.53 ± 1.93 ^b	7.4 – 10.7 ^a 8.95 ± 2.32 ^b
2.	Total erythrocyte count	× 10 ⁶ / μl	5.31 – 7.15 ^a 6.29 ± 0.95 ^b	3.85 – 5.73 ^a * 4.13 ± 1.21 ^b	4.67 – 6.94 ^a 5.62 ± 1.34 ^b
3.	Total leukocyte count	× 10 ³ / μl	5.23 – 7.95 ^a 6.05 ± 2.89 ^b	7.65 – 9.39 ^a * 8.29 ± 1.96 ^b	6.04 – 9.51 ^a 7.02 ± 2.01 ^b
4.	Differential leukocyte count				
	Neutrophils	%	49 – 63 ^a 55.93 ± 3.29 ^b	58 – 72 ^a * 65.24 ± 2.82 ^b	51 – 68 ^a 59.07 ± 3.21 ^b
	Eosinophils	%	2 – 6 ^a 2.43 ± 1.32 ^b	4 – 9 ^a * 5.92 ± 2.15 ^b	2 – 8 ^a 3.72 ± 1.93 ^b
	Lymphocytes	%	28 – 42 ^a 35.67 ± 2.97 ^b	18 – 29 ^a * 23.65 ± 2.34 ^b	25 – 37 ^a 30.36 ± 1.67 ^b
5.	Total protein	g / dl	5.23 – 8.04 ^a 6.39 ± 1.62 ^b	3.53 – 5.02 ^a * 4.62 ± 0.93 ^b	4.29 – 7.35 ^a 5.72 ± 1.37 ^b
6.	Albumin	g / dl	2.85 – 3.96 ^a 3.42 ± 0.74 ^b	1.06 – 2.79 ^a * 1.98 ± 0.65 ^b	2.23 – 3.69 ^a 2.92 ± 0.89 ^b
7.	Globulin	g / dl	2.27 – 3.65 ^a 2.97 ± 0.94 ^b	2.04 – 3.39 ^a 2.64 ± 0.57 ^b	2.45 – 3.65 ^a 2.80 ± 0.65 ^b
8.	A:G ratio	–	1.15	0.75	1.04

^aRange, ^bMean ± SD, * Significantly differed at ($p < 0.05$).

Biochemical changes revealed significant ($p < 0.05$) decrease in serum total proteins, serum albumin and insignificant decrease of A:G ratio. This might be due to the habit of the mites of chewing epidermal layer of the skin. Similar type of observations was recorded by Arlian *et al.* (1988) during his studies on haemato-biochemical changes in sarcoptic mange in rabbits. After administration of ivermectin and lincomycin, there was marked reduction in the severity of scratching and itching. A significant clinical improvement was noticed 7 days after the 1st injection of ivermectin in majority of the rabbits. Skin scrapings were negative for developmental stages of mange mites or eggs on day 10 onwards. Fresh hair growth resumed after 12 to 15 days. Ivermectin reduced the mite population by day 14 with 100% recovery. Rai (1988) and Kurade *et al.* (1996) also reported similar observations regarding efficacy of ivermectin against psoroptic mange in rabbits. All the treated rabbits resumed their lustrous hair and skin coat after 20 days of treatment (Fig. 3). All the haemato-biochemical parameters improved towards the normal control values after 14 days of treatment.

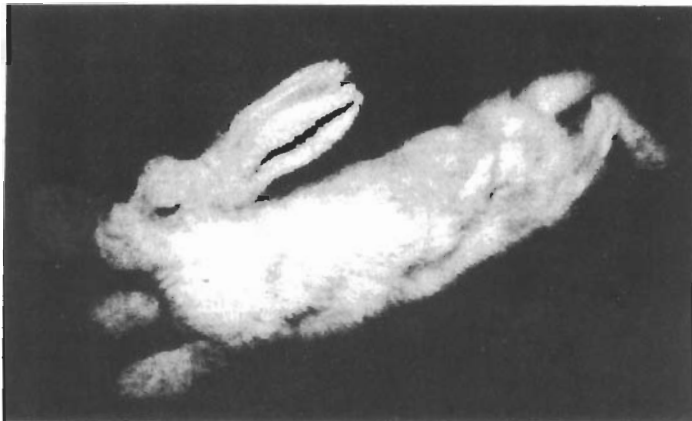


Fig. 1. A mange infested rabbit showing crust formation on the ears, face, forehead, eyelids and forelimbs.

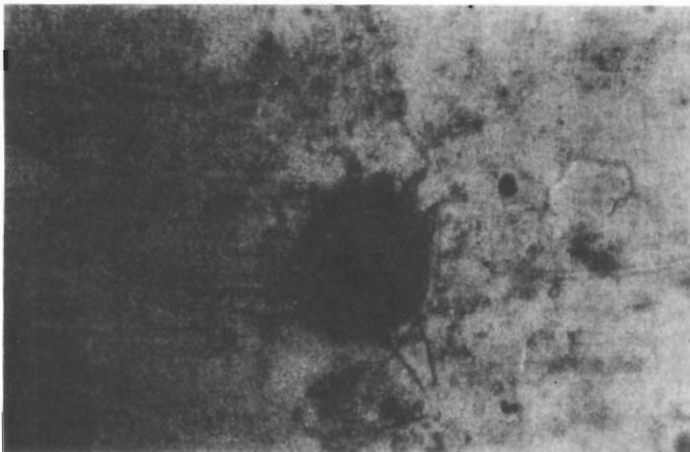


Fig. 2. *Psoroptes cuniculi* under microscope (100X).

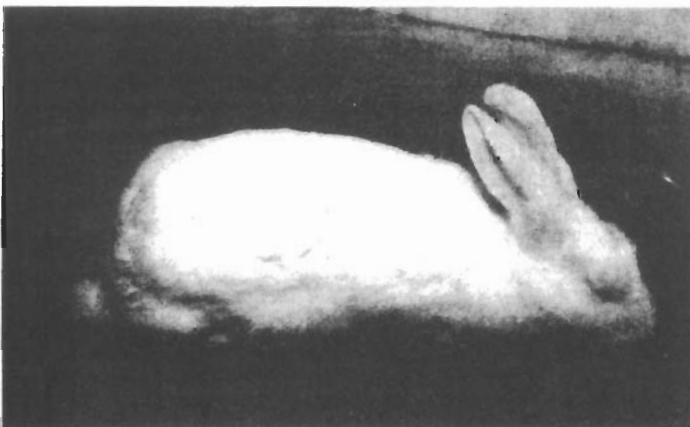


Fig. 3. The same recovered rabbit showing lustrous hair and skin coat after 20 days of treatment.

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