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CLINICAL SYNDROME IN EXPERIMENTAL *TRYPANOSOMA EVANSI* INFECTION IN SHEEP

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Trypanosoma evansi affects a wide range of hosts (Gill, 1991). Trypanosomiasis in sheep has been reported by many workers (Padmavathy *et al.*, 1977; Griffin, 1978; Bano and Jan, 1968; Manohar Rao *et al.*, 1987 and Applewhaite, 1990). Present experimental study was conducted to know the susceptibility and pathogenicity of *Trypanosoma evansi* infection in sheep.

Materials and methods

Twelve Madras Red Sheep, six males and six females aged 16-24 months, weighing 20-25 kg. were selected for the study. All the animals were screened for ecto and endoparasites and treated before the start of the experiment. The sera from all the animals were subjected to serological test and found to be free of previous exposure to *Trypanosoma evansi* infection. The sheep were maintained in fly proof isolation unit and fed ad libitum.

T. evansi strain was isolated from a naturally infected bullock and was maintained in laboratory animals. *T. evansi* was separated from blood of a heavily parasitaemic rat using mini-anion exchange method as described by Lanham and Godfrey (1970).

The separated organisms were suspended in phosphate buffered saline (PBS, pH 7.2) at a concentration of 10^5 organisms per millilitre and 1.5 ml of the inoculum was given to each animal intraperitoneally. The control sheep were given 1.5 ml (PBS, pH 7.2) intra peritoneally.

Two replications (R_1 and R_2) of experimental *T. evansi* infection in sheep were carried out. In each replication two rams and three ewes were used. One ewe was maintained as control under identical condition in each replication.

Baseline data on body weight and body temperature of each animal were recorded. All the infected control sheep were observed closely from 2nd day of infection for manifestation of clinical signs. The body weights were recorded at weekly interval.

The animals which died within 6 weeks, 12 weeks and beyond 12 weeks were presumed to be suffering with acute, subacute and chronic trypanosomiasis respectively.

Results

All the experimentally inoculated sheep picked up the infection. The prepatent period varied from 6 to 7 days in R_1 and 4 to 6 days in R_2. The patent period varied between 28 to 88 days in R_1 and 18 to 39 days in R_2. The course of the disease observed in R_1 was between 35 to 94 days and in R_2 between 23 to 45 days (Table 1).

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Two sheep (No.53 and 49) from R_1 and two sheep (No.207 and 54) from R_2 had acute form of the disease. One sheep (No.51) of R_1 had a chronic form of the disease and all the other sheep of R_1 and R_2 had subacute trypanosomiasis (Table 1).

Pyrexia was observed in all the ten infected sheep. Body temperature was ranging between 39.8°C and 41.6°C. Thermal reaction was highly erratic. Number of temperature peaks were ranging from 7 to 17 in R_1 and 4 to 10 in R_2 (Table 1).

Appetite of all experimental animals throughout the course of the disease was normal. Temperature rise was observed during evening hours than morning.

Abortion was observed in one ewe at 4th month of pregnancy, which occurred on 18th day of experimental *T. evansi* infection.

Orchitis with bilateral testicular swelling and enlargement was observed in all the rams infected (fig-1).

Marked facial edema was noticed in four sheep of R_1 and three sheep of R_2 by 8 week of infection mostly in subacute cases of trypanosomiasis. Periorbital edema was very pronounced in these cases (fig-2).

All the infected sheep had rough coat with loose fleece. They were running down in condition though the appetite was maintained. Towards the terminal stages of the disease the sheep were sluggish, reluctant to move and had a tendency to lie down frequently. The animals were recumbent 2-3 days prior to death.

There was a gradual loss of body weight in almost all animals except those died of acute trypanosomiasis (Table 2). All the infected animals died of the disease.

Fig. 1 Orchitis with testicular swelling in experimental *T. evansi* infection in sheep

Fig. 2 Periorbital edema, conjunctivitis, purulent lachrimal discharge in experimental *T.evansi* infection in sheep.

Discussion

The present finding of short prepatent period and course of the disease in experimental *T. evansi* infection in sheep conforms with observation made by Edward *et al.* (1956) and Boutellie *et al.* (1988), whereas Ikede (1979) and Maikaje *et al.* (1991) observed short pre patent period through intra venous inoculation of *T. evanis.*

Forty per cent of the infected sheep suffered from acute form , fifty per cent subacute and ten per cent chronic form of the disease. The high percentage of acute and subacute forms of the disease in this study is in agreement with earlier observations (Edwards *et al.*, 1956; Griffin and Allonby, 1979; and Maikaje *et al.*, 1991).

Highly erratic body temperature in trypanosomiasis of sheep was also observed by Griffin and Allonby (1979) and was not correlated with high parasitaemia as observed by Raina *et al.* (1986). On the otherhand Suliman and Feldman (1989) reported that temperature elevation was a consistent feature of trypanosomiasis especially during episodes of parasitaemia. In the present study each temperature rise was lasting three to four days similar to the findings of Ngeranwa *et al.* (1993).

Reduction in bodyweight, lethargy, debility and emaciation were reported in experimentally infected sheep with different species of Trypanosoma (Edwards *et al.*, 1956; Griffin and Allonby, 1979 a Bouteille *et al.*, 1988; Dirie *et al.*, 1988; Maikaje *et al.* 1991 and Edeghere *et al.*, 1992).

Facial edema, conjunctivitis, swollen eyelids, purulent lacrimal discharge, progressive loss of weight, anaemia, swollen lymph nodes, orchitis and abortion were also reported by many workers (Ikede, 1979; Akpavie *et al.*, 1987; Dirie *et al.*, 1988; Maikaje *et al.*, 1991).

Table 1 Infectivity of *Trypanosoma evansi* in sheep

Replication	Sheep No.	Pre-patent period (days)	Patent period (days)	Course of the disease (days)	No. of temp. peaks	Remarks
R_1	49	7	31	38	7	Acute
	51	6	88	94	17	Chronic
	52	7	49	56	12	Subacute
	53	7	28	35	7	Acute
	54	7	42	49	11	Subacute
	207	-	-	-	-	Control
Mean ±		6.8 ±	46.6 ±	53.4 ±	10.8 ±	
SE		0.2	11.06	10.9	1.86	
R_2	53	6	34	40	6	Subacute
	54	4	20	24	4	Acute
	70	6	39	45	10	Subacute
	81	6	37	43	7	Subacute
	207	5	18	23	5	Acute
	90	-	-	-	-	Control
Mean ±		5.4 ±	26.6 ±	35 ±	6.4 ±	
SE		0.4	4.41	4.76	1.02	

Table 2 Mean body weight in *T. evansi* infection in sheep

Week	Replication I (R_1)		't' value	Replication II (R_2)		't' value
	Control (kg)	Infected (kg)		Control (kg)	Infected (kg)	
1	22.0 ± 0	21.3 ± 0	7.8**	26.2 ± 0	24.7 ± 1.35	6.04**
2	22.6 ± 0	21.1 ± 0.87		26.4 ± 0	24.68 ± 1.35	
3	23.0 ± 0	20.98 ± 0.82		26.8 ± 0	23.16 ± 1.35	
4	23.2 ± 0	19.22 ± 0.59		27.2 ± 0	22.48 ± 1.18	
5	24.2 ± 0	19.8 ± 0.5		27.4 ± 0	22.7 ± 0.35	
6	24.2 ± 0	20.3 ± 0.55		27.5 ± 0	27.5 ± 0.77	
7	24.6 ± 0	19.7 ± 0.26		-	-	
8	25.4 ± 0	18.9 ± 0		-	-	
9	25.6 ± 0	18.0 ± 0		-	-	
10	25.8 ± 0	18.4 ± 0		-	-	
11	25.8 ± 0	18.0 ± 0		-	-	
12	26.0 ± 0	18.0 ± 0		-	-	
13	26.0 ± 0	17.5 ± 0		-	-	
Mean	24.5 ±	19.33 ± 0		26.91 ±	23.07 ±	
SE	0.39	0.37		0.22	0.74	

** Highly significant (≤ 0.0)

Summary

Clinical syndrome in experimental *T. evansi* infection in sheep has been described. Highly erratic body temperature, reduction in body weight, lethargy, debility, anaemia, facial edema, abortion, orchitis and paresis at terminal stages followed by death have been observed in all the infected sheep.

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