CLINICOHEMATOLOGICAL STUDIES ON EXPERIMENTAL MYCOPLASMA MYCOIDES SUBSP. MYCOIDES (LC) PNEUMONIA IN LAMBS

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ABSTRACT

Experimental pneumonia in lambs could be reproduced by M. mycoides subsp. mycoides (12 ml of PPLO broth culture containing 1.2 x 10^9 cfu/ml) in lambs administered by respiratory route. Clinical signs constituted rise in temperature, nasal and ocular discharge, dullness, depression, coughing, sneezing, laboured breathing and arching of back. Hb, PCV and TEC values declined. A significant neutrophilia along with lymphocytopenia was also noticed.

INTRODUCTION

Pneumonia is one the major diseases affecting sheep and goats. Particularly young lambs are more susceptible and the major impediment in the development of sheep industry is the loss of lamb crop due to pneumonia (Sreeramulu and Krishnaswamy, 1987). M. mycoides subsp. mycoides has been implicated in causation of pneumonia in sheep (Gupta et al., 1988). However, its role in causation of pneumonia disease process in sheep has not been well elaborated. In the present communication an attempt has been made to detail clinicohematological studies of M. mycoides subsp. mycoides (LC) pneumonia inducted experimentally in lambs.

MATERIAL AND METHODS

M. mycoides subsp. mycoides (LC) organism isolated locally from pneumonic lungs of lamb, formed the basis for present study. Ten lambs (4-6 months old) which were found negative for Mycoplasma by nasal swab isolation as well as serologically using growth inhibition test (Razin and Tully, 1983) procured from Central Sheep Breeding Farm, Hisar were divided randomly into two groups comprising five lambs in each and kept in different enclosures. The lambs were administered with oxytetracycline (Wochardt Veterinary Limited) @ 5mg/kg b. wt. b.i.d. for 3 days a week before experimentation. The animals maintained in utmost hygienic conditions were provided gram husk, green fodder and clean water ad libitum. In group I, each lamb was administered with 12 ml PPLO broth containing 1.2 x 10^9 cfu/ml of 50 hours log phase culture of M. mycoides subsp. mycoides (LC) by respiratory route (8 ml intratracheally and 4 ml intranasally). Group II control animals were administered with 12 ml sterile PPLO broth by respiratory route as described earlier. All experimental animals were examined clinically daily throughout the period of experiment for 28 days. Any untoward clinical signs, general health condition and mortality were duly recorded. Blood samples using EDTA were drawn from Jugular vein of two lambs at 0, 3, 7, 10, 14, 18, 21 and 28 days post infection (DPI). Fresh blood smears were drawn for differential leukocytic count. Hematological parameters comprising Hemoglobin (Hb), Packed cell volume (PCV), Total erythrocyte count (TEC), Total leukocyte count (TLC), Differential leukocyte count (DLC) were evaluated following standard procedures (Oser, 1965; Schalm et al., 1975).

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RESULTS AND DISCUSSION

Clinical signs appeared 2 DPI onwards, were more conspicuous and intense from 3 to 8 DPI. The signs generally observed were anorexia, dullness, depression, nasal (Fig. 1) and ocular discharge, sneezing, coughing, rise in temperature (Mean 102.2°F to 104.9°F), arching of back and disinclination to move. One lamb manifested hot painful swelling in knee and hock joints. Serous nasal discharge observed initially became mucopurulent later on and was seen up to 11 DPI. Similarly serous discharge from eyes became thick and sticky later on. Temperature rose from 2 DPI onwards with its peak on 7 DPI (Mean 102.2°F to 104.9°F). The clinical signs observed were in confirmation with those reported in sheep by Rosendal (1981), Gupta et al. (1988) and Chaturvedi et al. (1992) with M. mycoides subsp. mycoides. However, arching of back a manifestation of respiratory distress was not listed by them. Diarrhoea as noticed by Gupta et al. (1988) could not be observed in present studies. Swelling in joints (seen in one lamb), might be because of localisation of organisms in joints as reported in few cases by Gupta et al. (1988). An early mortality in Mycoplasma inoculated lambs occurred at 3, 5 and 7 DPI. No clinical signs as well as mortality noticed in control lambs. Chaturvedi et al. (1992) also reported mortality in lambs upto 7 DPI due to intratracheal administration of M. mycoides subsp. mycoides in sheep. Organism could be reisolated from lungs in the present studies.

Fig. 1. An affected lamb showing seromucois nasal discharge
Fig. 2. Mean hemoglobin content of different groups of lambs

Fig. 3. Mean total leukocyte count (TLC) of different groups of lambs
A marked significant decrease in Hb, PCV and TEC values from 3 DPI onwards was observed (Fig. 2). The trend continued upto 18 DPI. Such studies in sheep have not been reported earlier. Though similar observations in experimental M. mycoides subsp. mycoides infection in kids and calves were stated by Kumar et al. (1994) and Kapoor (1993), respectively. This could be because of possible suppression or destruction of hemopoietic system by "endotoxin" like effect of M. mycoides subsp. mycoides as suggested by Villemot et al. (1962). A significant increase in TLC (Fig. 3) values from 3 DPI onwards was continued upto 10 DPI. It was accompanied with neutrophilia and relative lymphocytopenia (Fig. 4). Similar observation were made in sheep (Gupta et al., 1988) and in kids (Guha and Verma, 1987; Nayak and Bhowmik, 1988) with M. mycoides subsp. mycoides infection. Neutrophilia occurs as a result of systemic response to injury and is mediated by IL-1 following exposure to invading Mycoplasma and also due to damaged tissue. IL-1 acts directly on bone marrow to stimulate the release of neutrophils into circulation causing neutrophilia (Vegad, 1995).

![Graph](image)

Fig. 4. Mean neutrophil and lymphocyte count of different groups of lambs

Hence in the present study it was possible to associated M. mycoides subsp. mycoides (LC) in causation of sheep pneumonia experimentally.

REFERENCES