



Prevalence and Aetiopathological studies of ovine interstitial pneumonia

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Abstract

The present study was conducted from June, 2013 to July, 2014 to identify the bacteria involved and histopathological changes in interstitial pneumonia of sheep slaughtered in different slaughterhouses in and around Vijayawada and from the animals necropsied in the Department of Veterinary Pathology, N.T.R College of Veterinary Science, Gannavaram and from field mortalities. A total of 187 pneumonic lungs of sheep were examined for histopathological changes and bacteriological isolations. Interstitial pneumonia was noticed in 5 cases. Grossly, the lungs showed rib impressions on the surface. Microscopically, the alveoli were distorted in shape. The alveolar septae was thickened with infiltration of mononuclear cells and macrophages. Infection with both *Edwardsiella spp.* and *Klebsiella spp.* has been implicated in the aetiology of this condition.

Keywords: Aetiopathology, Pneumonic Lungs, Interstitial pneumonia, sheep.

Introduction

Livestock is very important both for the subsistence and economic development in India. Small ruminants assume a uniquely important position in live stock production. Unlike cattle, small ruminants are capable of remarkable adaptability to diverse environmental conditions and are amenable ease of management.

The respiratory diseases constitute a serious and major problem for breeders because of the major economic losses they cause, and the expenses of the care and preventions that they generate (Belkhiri et al., 2014). Bacterial infection of the respiratory tract may be primary, occurring in healthy individuals or secondary to a large number of conditions which depress resistance. Secondary bacterial infection occur especially when the local resistance of the respiratory mucosa is lowered and bacterial growing in the nose and throat extends down wards, usually giving a mixed infection. (Megra et al., 2006)

Materials and Methods

Following slaughter, lungs were first examined in situ and any lesions observed were noted. Then whole lungs from all the animals were collected and thoroughly screened by visual examination, palpation and dissection. 187 of 988 lung samples with gross lesions in favour of pneumonia were subjected to microbial culture. The swabs collected in sterile test tubes were inoculated in Nutrient broth and Brain Heart Infusion (BHI) broth and incubated at 37^oC for 24 hours. Then the broth culture material was streaked on Nutrient agar and BHI agar plates prepared in the laboratory as per manufacturer's instructions. A provisional identification of bacterial growth was done based on the colony morphology and Gram's staining. Isolation and characterization of bacteria was done as mentioned in Bergey's Manual of Determinative Bacteriology (Holt et al., 1994).

Representative tissue samples collected from different portions of the lungs that showed lesions for histopathological examination were processed by routine paraffin embedding technique. Sections of 4 to 5 μ thickness were cut and stained by Harris Haematoxylin and Eosin method.

Results

In the present study, interstitial pneumonia was noticed with an incidence of 2.67%. Grossly, the lungs were pale to red, heavy and firm, that failed to collapse when thorax was opened. The lungs showed rib impressions on the surface (Fig. 1). Cut section revealed a slightly meaty appearance.

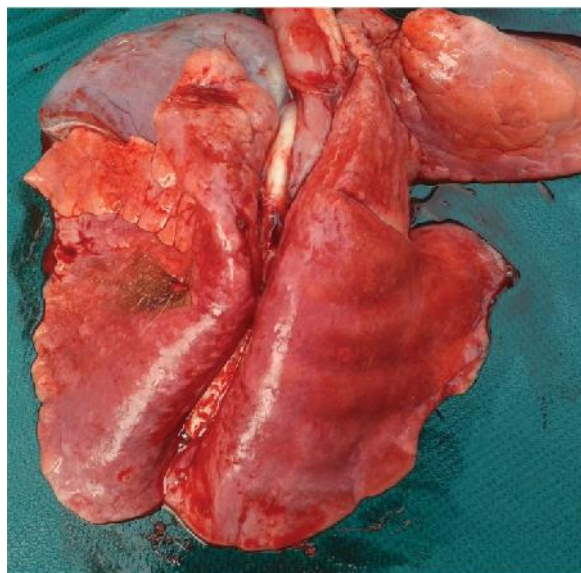


Fig. 1 Lung section reveals rib impressions on the surface.

Microscopically, the alveoli were distorted in shape. The alveolar septae were congested and thickened with infiltration of mononuclear cells, and macrophages (Fig. 2). Hyperplasia of bronchial and bronchiolar epithelium into the lumen was observed along with lymphoid hyperplasia in the

peribronchiolar regions (Fig. 3). At some places, the alveolar epithelium revealed foetalization.

Various types of bacteria isolated from the cases of interstitial pneumonia were *Edwardsiella spp.* and *Klebsiella spp.*

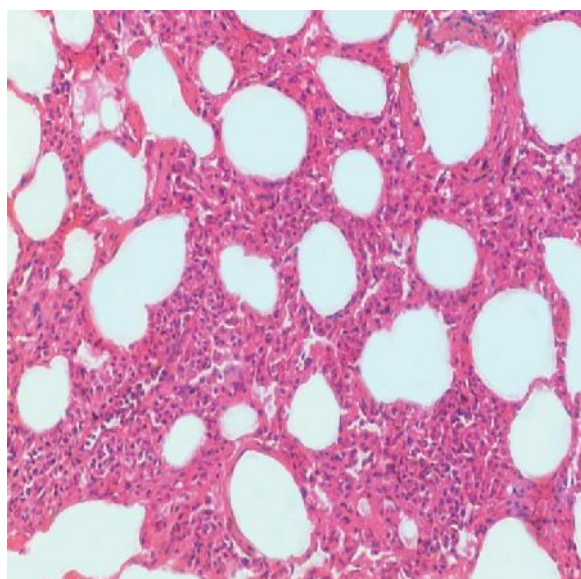


Fig. 2 Note thickened alveolar septa with infiltration of mononuclear cells H&E x 100.

Discussion

In the present investigation, interstitial pneumonia was observed with an incidence of 2.67%. The occurrence in the present study was low when compared to the earlier reports of Azizi et al., (2013), Dar et al., (2013), Priyadarshi et al., (2013) and Belkhiri et al., (2014) and high when compared to the previous reports of Sriraman and Rama rao (1980) and Chattopadhyay et al., (1986).

Grossly, the lungs were pale, heavy and firm, failed to collapse when thorax was opened and showed rib impressions on the surface. Microscopically, thickening of septa with infiltration of mononuclear cells and lymphoid hyperplasia in the peribronchiolar regions were observed. The gross and microscopic findings in the present study were in accordance with Bhagwan and Singh (1972), Dar et al., (2013), Priyadarshi et al., (2013) from India and Oruc (2006) and Azizi et al., (2013) from abroad.

In the present study, from 2 cases of interstitial pneumonia *Klebsiella spp.*, and *Pseudomonas spp.* were isolated similar to that reported by Azizi et al., (2013).

Conclusion

Usually interstitial pneumonia can result from aerogenous injury to the alveolar epithelium or from hematogenous injury to the alveolar capillary endothelium or alveolar basement membrane. Elastic nature or meaty appearance of the lungs observed in interstitial pneumonia can be attributed to the thickening of alveolar walls resulted in differentiation and replacement of destroyed type-I pneumocytes by the progenitors viz. type II pneumocytes. (McGavin and Zachary, 2007).

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