

CLINICO-PATHOLOGICAL STUDY OF ASPIRATION PNEUMONIA IN GOATS

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ABSTRACT

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A total of 918 lung samples of goats irrespective of sex, age and breed were examined. Out of these, 384 lung samples showing gross lesions were subjected to pathological examination. Histopathological examination revealed pneumonic lesions in 264 lung samples. Among these 264 lung samples, aspiration pneumonia was observed in 03 (1.14%) lung samples. On macroscopic examination, the affected lungs were enlarged and oedematous. The affected areas showed dark greenish to blackish discoloration with foul smelling. On microscopic examination, necrosed areas with the presence of foreign materials in the bronchiole and bronchi were seen along with haemorrhagic areas. Haematological parameters were evaluated in 20 pneumonic goats (study group) and 20 healthy goats (control group). The Hb, PCV, TEC, TLC and DLC were estimated. Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) and Mean Corpuscular Haemoglobin Concentration (MCHC) were estimated. The mean±S.E. values of Hb concentration, PCV and TEC showed significant decrease whereas non-significant increase was seen in the values of MCV, MCH and MCHC. Significant leucocytosis, neutrophilia, lymphopenia, monocytosis and eosinopenia were recorded.

Keywords: Goats, aspiration pneumonia, clinico-pathology, haematology

Introduction

The livestock sector in India is an important sector in rural economy. Goat is an important economic small ruminant, which is domesticated by people worldwide. It has an important role in the subsistence and economic growth in India. Dhara *et al.* (2008) stated that in rural areas, goat keeping gives employment at the rate of 4.2% per annum. The respiratory diseases constitute a serious and major problem for goat breeders because of the major economic losses they cause, and the expenses of the care and prevention that they generate (Belkhiri *et al.*, 2009). Lungs are the most exposed organs to different insults because of their anatomical and histological peculiarities. Pneumonia is an inflammatory response of the bronchioles and alveoli in the lung to infective agents and resulting in the consolidation of lung tissue. Aspiration pneumonia is caused by wrong drenching of drugs and accidental aspiration of feed materials. It is characterized by the presence of aspirated foreign material in the bronchi and bronchioles. Grossly, dark brown, congested and somewhat meaty in consistency areas are seen in the affected lungs. Histopathologically, presence of aspirated foreign material is seen in tissue.

Materials and Methods

In the present study, a total number of 918 lung samples of goats irrespective of sex, age and breed were examined. The samples were collected from pneumonia affected goats from abattoirs in and around Bikaner, Nagaur, Sikar and Ajmer districts of Rajasthan. Out of these, 384 lung samples showed gross lesions, which were subjected to pathological examination. All the collected samples were properly preserved in 10% buffered formalin. The parts of affected tissues presenting the lesions along with adjacent normal tissues were preserved and processed for further histopathological examination. The tissue sections of 4-6 micron thickness were cut and stained with haematoxylin and eosin stain.

The blood samples were collected from 20 pneumonia

affected goats (study group) from abattoirs in and around Bikaner, Nagaur, Sikar and Ajmer districts of Rajasthan just before slaughter after clinical examinations. Blood samples were also collected from 20 apparently healthy goats (control group). Blood was collected in two vials, one with EDTA for haematological estimations and another without EDTA for serum separation.

The Haemoglobin Concentration (Hb), Packed Cell Volume (PCV), Total Erythrocyte Count (TEC), Total Leucocyte Count (TLC) and Differential Leucocyte Count (DLC) were estimated as per the methods described by Jain (1986). Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) and Mean Corpuscular Haemoglobin Concentration (MCHC) were calculated as per the methods described by Coles (1986).

The data obtained from this study were analysed and interpreted by student's t-test using the SPSS software version-20.

Results and Discussion

A total number of 918 lung samples of goats irrespective of sex, age and breed were examined. Out of these, 384 lung samples showed gross lesions, which were subjected to pathological examination. Histopathological examination revealed pneumonic lesions in 264 lung samples. Among 264 screened pneumonic lung samples, aspiration pneumonia was observed in 03 (01.14%) lung samples. Almost similar incidence (01.90%) was recorded by Mahile *et al.* (2022). Slightly higher incidence (04.70%) of aspiration pneumonia was recorded by Mekibib *et al.* (2019) and lower incidence (0.70%) was recorded by Mohammed *et al.* (2022).

On macroscopic examination, the aspiration pneumonia affected lungs were found enlarged and oedematous. The affected areas showed dark greenish to blackish colouration with foul smelling (Fig. 1) as similar to the findings of Mekibib *et al.* (2019). Congested and consolidated areas were seen on different parts of lungs. Cut surfaces showed the presence

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Fig. 1: Photograph of lung showing dark greenish to blackish discoloration

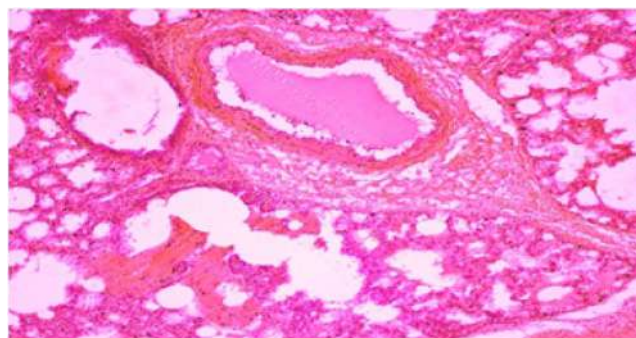


Fig. 2: Microphotograph of lung showing the presence of foreign materials in the bronchiole and bronchi (H&E, 100X).

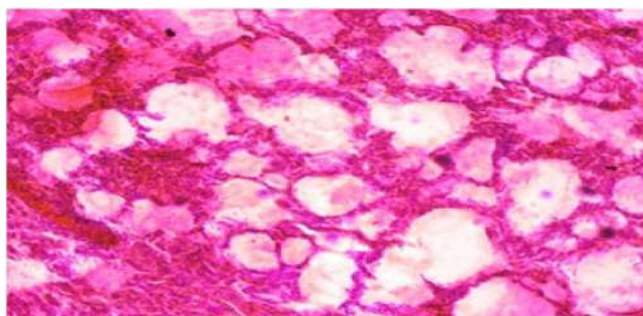


Fig. 3: Microphotograph of lung showing inter alveolar edema, inflammatory changes and congestion (H&E, 100X).

of drenched material. Gross findings were similarly described by Mekibib *et al.* (2019) and Mohammed *et al.* (2022).

On microscopic examination, necrosed areas with the presence of foreign materials in the bronchiole and bronchi were seen with haemorrhagic areas (Fig. 2) as similar to the findings of Mohammed *et al.* (2022). Evidence of inter alveolar oedema, inflammatory changes and congestion were also noticed (Fig. 3). The microscopic findings were similarly described by Mekibib *et al.* (2019) and Mohammed *et al.* (2022).

The mean±S.E. values of the Hb, PCV, TEC, MCV, MCH and MCHC have been depicted in Table. The present study revealed significant decrease ($P<0.05$) in values of Hb

concentration (8.98 ± 0.26), PCV (27.32 ± 1.01) and TEC (8.17 ± 0.37) while non-significant increase in the values of MCV (35.19 ± 2.29), MCH (11.30 ± 0.49) and MCHC (33.90 ± 1.85) in goats affected with pneumonia when compared with the corresponding values of apparently healthy goats.

The mean±S.E. values of the TLC, per cent values of neutrophils, lymphocytes, monocytes and eosinophils have been depicted in Table. There was significant increase ($P<0.05$) in value of TLC (17015 ± 264.1) as well as in per cent values of neutrophils (48.85 ± 3.27) and monocytes (3.45 ± 0.39) while significant decrease ($P<0.05$) in per cent values of lymphocytes (46.15 ± 3.45) and eosinophils (1.55 ± 0.26) when compared with the corresponding values of apparently healthy goats.

The present study revealed that mean values of the Hb, PCV and TEC significantly decreased whereas MCV, MCH and MCHC values have non-significantly increased. The mean values of the TLC, per cent values of neutrophils and monocytes have significantly increased in pneumonic goats as compare to apparently healthy controls whereas per cent values of lymphocytes and eosinophils have significantly decreased. These findings are well supported by findings of Mondal *et al.* (2004). The TLC and DLC are more reliable indications for the presence of lesion than the clinical assessment (Radostits *et al.*, 2007).

Table: Mean±S.E. values of haematological parameters in pneumonic and apparently healthy goats

S. No.	Parameters	Apparently healthy goats (n=20)	Pneumonic goats (n=20)	Normal reference range (Radostits <i>et al.</i> , 2007)
1	Hb (gm %)	9.90±0.32	8.98±0.26*	8-12
2	PCV (%)	29.90±0.32	27.32±1.01*	22-38
3	TEC (million/ μ l.)	9.20±0.34	8.17±0.37*	8-18
4	MCV (fl.)	33.38±1.30	35.19±2.29 ^{NS}	19-37
5	MCH (pg.)	11.01±0.51	11.30±0.49 ^{NS}	5.2-8.0
6	MCHC (g/dl.)	32.95±0.73	33.90±1.85 ^{NS}	30-36
7	TLC (per μ l.)	10065±178.89	17015±264.1*	4000-13000
8	Neutrophil (%)	39.95±1.85	48.85±3.27*	30-48
9	Lymphocyte (%)	55.65±1.85	46.15±3.45*	50-70
10	Monocyte (%)	2.10±0.43	3.45±0.39*	1-4
11	Eosinophil (%)	2.30±0.26	1.55±0.26*	3-8

(* $P<0.05$ - significant, NS – non significant)

Conclusion

It is concluded that aspiration pneumonia caused significant decrease in mean \pm S.E. values of Hb concentration, PCV and TEC whereas non-significant increase was seen in the values of MCV, MCH and MCHC. Significant leucocytosis, neutrophilia, lymphopenia, monocytosis and significant eosinopenia were also recorded.

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