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## Rumen impaction incidence, diagnosis and laboratory findings in sheep

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### Abstract

An abattoir survey was carried out to know incidence of rumen impaction due to non-penetrating foreign bodies in sheep. Sheep presented to veterinary college hospital, Bidar with signs suggestive of ruminal impaction, chronic anorexia and recurrent bloat were screened. From these six sheep confirmed having plastic material after performing rumenotomy were utilized to compare clinical, rumen liquor, haematological, biochemical changes and radiography with the apparently healthy sheep taken as control. The overall incidence of rumen impaction was 10.79% in sheep due to non-penetrating foreign body syndrome. The clinical examination revealed reduced force of ruminal contraction. Haematological examination revealed leukocytosis, neutrophilia and lymphopenia in all sheep affected with the foreign body syndrome. Rumen liquor examination revealed alkaline pH, reduced protozoal motility, protozoal count and TVFA concentration and marked increase in MBRT and SAT. Serum analysis revealed hypoproteinemia, hypoalbuminaemia, hypoglycemia, hypocalcemia and hypophosphatemia. Radiography was not highly diagnostic in detection of non-penetrating foreign bodies since most of them were radiolucent.

**Keywords:** Rumen impaction, non-penetrating foreign body syndrome, recurrent tympany, chronic anorexia, radiography

### Introduction

India has currently 71.6 million sheep population with annual growth rate of 3.9%. Most farmers adopt free grazing system due to poverty, lack of land and green fodder, modern life style has lead to indiscriminate and improper dispose of plastic bags along with eatables. Sheep due to their indiscriminate feeding habit and poor sense of taste (Udall, 1984) [19] feed on indigestible material. Sequel of penetrating foreign bodies and their diagnosis is well known. However, diagnosis of non-penetrating foreign body, its effect on animal health is not well established. Therefore, the present study was carried out to know the incidence, diagnosis and its effects in sheep.

### Materials and Methods

Incidence study was carried out based on slaughter house survey at Bidar and Bangalore. The present study consisted of two groups, Group I, consisted of apparently 6 healthy sheep (Control) and sick sheep attending Veterinary college hospital with signs suggestive of ruminal impaction or chronic recurrent bloat were screened and subjected to radiographical study (Singh *et al.*, 2008) [13]. From these 6 sheep confirmed having plastic material after performing rumenotomy were taken as Group II (Affected). All the sheep of Group I and II were subjected to rumen liquor analysis for pH using digital pH meter, protozoal density, total protozoal count, Gram positive to Gram negative ratio, Methylene Blue Reduction Time (MBRT), Sedimentation Activity Test (SAT), Total Volatile Fatty Acid (TVFA) (Barnett and Reid, 1956) [2]. Haematological examination (Schlam *et al.*, 1975) [15] and serum biochemistry were analyzed. The data collected on various parameters were statistically analyzed as per the method of Snedecor and Cochran (1989) [18]. Students 't' test was used to compare the means between the groups.

### Results and Discussion

The incidence of non-penetrating foreign body at Bidar was 8.22% (6 out of 73) and 10.95% (133 out of 1215) with and overall incidence of 10.79%. The Mean±S.E values of rumen liquor, haematological and serum biochemistry parameters are given in Table 1, Table 2 and Table 3 respectively.

The present study showed alkaline pH (Nambi and Gnanaprakasam, 1993 and Gahlot *et al.*, 2005) [12, 8], low protozoal count (Boodur, 2010) [5], increased SAT time (Dakshinkar, 2005 and Blood *et al.*, 2000) [6, 4], prolonged MBRT (Garry, 1990) [9], reduced protozoal count (Ramasamy, 1984) [14] and marked decrease in TVFA concentration (Vishwanath Hegga, 2005) [20]. The present study showed predominance of Gram negative bacteria than Gram positive bacteria. Similarly, predominance of Gram negative bacteria in healthy cattle and goat were reported by Patil *et al.*, (2008) [13] and Darwin (2007) [7] respectively.

Haematological examination revealed leukocytosis, neutrophilia and lymphopenia (Hailat *et al.*, 1997) [10] in Group II. This may be attributed to sloughing, erosions and chronic irritation of ruminal mucosa caused by plastic foreign bodies.

Whereas serum analysis showed marked hypoproteinemia, hypoalbuminaemia, hypoglycemia, hypocalcaemia and hypophosphatemia in Group II animals. This may be attributed to chronic anorexia, poor absorption of these minerals from impacted rumen. The present findings were in accordance to Igbokwe *et al.*, (2003) [11] and Sharma *et al.*, (2012) [16].

Radiographical examination revealed radiolucent areas merging with fluid shadows, suggestive of plastics were observed in 2 sheep (Fig 1 and 2). The above findings were in agreement with Bhargava and Tyagi (1975) [3], Singh *et al.*, (2008) [17] and Athar *et al.*, (2010) [1].

**Table 1:** Mean±S.E. values of rumen liquor parameters in sheep

Parameter	Group I	Group II	T- value
pH	7.07±0.11	8.10±0.09	7.0*
SAT (min)	8.5±0.43	23.67±1.28	11.22**
MBRT (min)	7.33±0.33	20.67±1.08	11.74**
Protozoal count (10 <sup>5</sup> /ml)	7.67±0.56	3.0±0.36	7.0**
G+Ve	19.33±1.02	26.67±3.55	1.99 <sup>NS</sup>
G- Ve	80.67±1.02	73.33±3.55	1.99 <sup>NS</sup>
TVFA (mmol/L)	106.6±5.50	67.31±3.58	5.98**

\*- Significant @ 5% ( $p < 0.05$ ), \*\*- Significant @ 1% ( $p < 0.01$ ) and NS- Non-significant

**Table 2:** Mean±S.E. values of haematological parameters in sheep

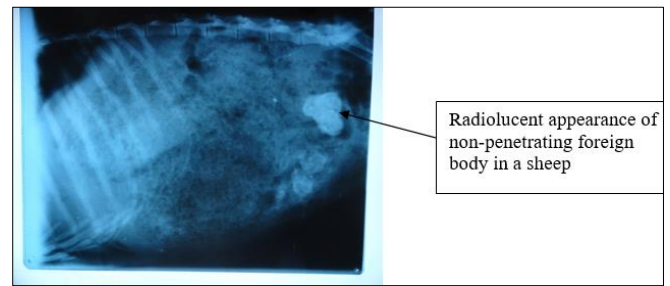
Parameter	Group I	Group II	T- value
Heamoglobin (g/dl)	11.92±0.44	9.8±0.73	2.83*
PCV (%)	27.10±2.53	36.70±1.35	3.35**
TEC ( $\times 10^6/\mu\text{l}$ )	10.74±0.55	9.43±0.63	1.56 <sup>NS</sup>
TLC ( $\times 10^3/\mu\text{l}$ )	9.90±1.17	14.68±0.81	3.37**
Neutrophils (%)	69.83±1.05	79.0±0.82	6.91**
Eosinophils (%)	2.67±0.21	2.0±0.26	2.0 <sup>NS</sup>
Lymphocytes (%)	21.67±0.94	12.83±0.60	7.44**
Monocytes (%)	6.33±0.21	6.17±0.48	0.32 <sup>NS</sup>

\*- Significant @ 5% ( $p < 0.05$ ), \*\*- Significant @ 1% ( $p < 0.01$ ) and NS- Non-significant

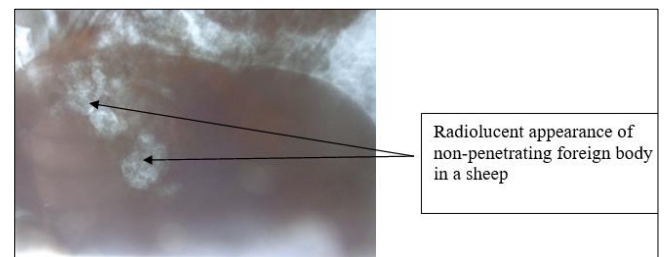
**Table 3:** Mean±S.E. values of serum biochemistry parameters in sheep

Parameters	Group I	Group II	T- value
Total protein(g/dl)	7.74±0.31	5.55±0.19	6.01**
Albumin (g/dl)	4.72±0.41	2.97±0.04	0.21 <sup>NS</sup>
Globulin (g/dl)	3.02±0.19	2.57±0.16	4.82**
Glucose (g/dl)	72.17±1.36	44.96±2.24	10.39**
Creatinine (mg/dl)	1.46±0.14	1.89±0.18	1.86 <sup>NS</sup>
BUN (mg/dl)	12.56±1.0	11.64±1.27	0.57 <sup>NS</sup>
Calcium (mg/dl)	9.70±1.03	5.75±0.19	3.78**
Phosphorous(mg/dl)	6.33±0.14	5.42±0.19	3.46**

\*- Significant @ 5% ( $p < 0.05$ ), \*\*- Significant @ 1% ( $p < 0.01$ ) and NS- Non-significant



**Fig 1:** Radiographical examination revealed radiolucent areas merging with fluid shadows, suggestive of plastics were observed in 2 sheep



**Fig 2:** Radiographical examination revealed radiolucent areas merging with fluid shadows, suggestive of plastics were observed in 2 sheep

### Conclusion

It was concluded that rumen impaction due to non-penetrating foreign body in sheep is very high and it can be accurately diagnosed based on analysis of rumen liquor, haematological and serum analysis combined with history and corresponding clinical signs.

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