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Full Length Research Paper

Etio-pathological investigations to study the gross and histopathological lesions affecting gastrointestinal tract of sheep

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Thirty sheep/lambs were brought for post mortem in Teaching Veterinary Clinical Complex, LUVAS and Central Sheep Breeding Farm, Hisar, which were investigated for gastrointestinal tract pathology in laboratory of Department of Veterinary Pathology. Mortality was maximum in sheep/lambs of age group 6 months to 1 year and higher in males than females. Gross pathological changes in gastro intestinal system noticed were congestion in abomasum, intestine, pancreas, liver and mesenteric lymph nodes. Histopathologically, there was congestion, desquamation of mucosal epithelium, submucosa in abomasum and small intestine including goblet cell hyperplasia. Congestion along with mild necrosis in pancreatic acini, liver parenchyma, peri portal area and mesenteric lymph node was observed along with haemorrhage in peri portal area and thrombosis of portal blood vessel in liver. Cloudy swelling, fatty changes, centrilobular necrosis in parenchyma and bile duct hyperplasia in liver was also reported.

Key words: Gastro-intestinal, gross changes, histopathology, sheep.

INTRODUCTION

Gastrointestinal tract disorders (GIT) play an important role in causing high mortality and morbidity in sheep affecting the profits in sheep production programmes (Lamy et al., 2012). Some of the diseases are Johne's disease (paratuberculosis), *Escherichia coli* diarrhoea, Salmonellosis, *Clostridium prefringens* type- B, C (enterotoxaemia) and type-D, bloat, diarrhoea and Peste des petits ruminants (PPR) (Tefera et al., 2009). Mortality in sheep/lambs causes a great deal of concern to sheep breeders, leading to poor economic returns. Certain diseases like gastro-enteritis causes heavy mortality and adversely affect the profits in livestock production programmes (Carrigan and Seaman, 1990; Doghaim et al., 2000). For the prevention and control of gastrointestinal tract disorders in sheep, it is desirable to know etiology

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Table 1. Age and sex wise distribution of mortality due to various gastrointestinal pathological lesions among sheep/lambs.

Age	No. of cases	Sex	
		Male	Female
< 2 months	3/30 (10%)	3/30 (10%)	-
2 months-5 months	4/30 (13.3%)	3/30 (10%)	1/30 (3.3%)
6 months -1 year	18 /30 (60%)	12 /30 (40%)	6/30 (20%)
> 1 year	5/30 (16.6%)	4 /30(13.3%)	1/30 (3.3%)
Total	30/30	22/30 (73.3%)	8/30 (26.6%)

Table 1 indicates maximum mortality in sheep/lambs were found in age groups of 6 months to 1 year group and in male sheep/lamb.

and clinico-pathological aspects of gastrointestinal tract disorders. The present study had been formulated on etio-pathological investigations to study the gross and histopathological lesions affecting gastrointestinal tract of sheep.

MATERIALS AND METHODS

Thirty sheep/lambs were brought for post mortem in Teaching Veterinary Clinical Complex, LUVAS and Central Sheep Breeding Farm, Hisar, which were investigated for gastrointestinal tract pathology in laboratory of Department of Veterinary Pathology. The percent cases of mortality due to various pathological conditions in different age groups (< 2 months, 2-5 months, 6 months -1 year and > 1 year), sex and affected gastrointestinal tract was analysed. The gross pathological studies were conducted at the time of collection of tissue specimens and the lesions were recorded. The tissues were taken to the laboratory of Department of Veterinary Pathology and preserved in 10% formal saline. From the most representative sites tissues showing pathological lesions were taken, processed and sectioned at 4 to 5 µ thickness and staining is done using Lily Mayer's haematoxylin and 2% water soluble eosin (Luna, 1968). Histo-pathological lesions were recorded and compared within age groups, sex and organs of gastrointestinal tract.

RESULTS

Age wise distribution of mortality in sheep/lambs has been presented in Table 1 and which indicates that maximum mortality was found in age group of 6 months to 1 year (18/30, 60%) followed by >1year (5/30, 16.6%), 2 to 5 months (4/30, 13.3%) and < 2 months age group (3/30, 10%). Sex wise distribution of mortality in sheep/lambs has been given in Table 1. It showed that overall mortality was more in males than female sheep/lambs. To specify further, mortality in age group of < 2 months was (10% in male, 0% in females), 2 to 5 months (10% in males and 3.3% in females), 6 months to 1 year (40% in males and 20% in females) and >1 year (13.3% in males and 3.3% in females). Overall mortality in males was 73.3% and in females was 26.6%. The main gastrointestinal affections were enteritis and hepatitis.

The gross pathological changes observed in different organs are depicted in Table 2 shows that in gastrointestinal tract, congestion was the most prominent change seen in intestine (9 cases) (Figure 1) followed by abomasum (5 cases) (Figure 2) and liver (4 cases) (Figure 3). Other pathological lesions include catarrhal enteritis (5 cases) (Figure 4) and necrotic foci in liver (3 cases) (Figure 5). Major microscopic lesions in gastrointestinal tract found were congestion of abomasal mucosa and submucosa (Figure 6) followed by desquamation of mucosal epithelium, mild congestion in mucosa and submucosa, goblet cell hyperplasia and mucosal glands filled with leucocytes (Figure 7) in small intestine. In mesenteric lymph node, cystic spaces due to excess depletion of lymphocytes and severe congestion in cortex (Figure 8) were evident. Congestion with mild necrosis of pancreatic acini (Figure 9) was also reported. In liver, thrombosis of portal vessel (Figure 10), cloudy swelling and congestion of portal triad (Figure 11), haemorrhage in hepatocytes (Figure 12), bile duct hyperplasia (Figure 13), haemorrhage in periportal area and centrilobular necrosis in liver (Figure 14) was observed.

DISCUSSION

Mortality in male sheep/lambs was comparatively higher than in females were in confirmation with Lashari and Tasawar (2011) findings. The possible reason for the present findings is that testosterone indirectly induces the immunosuppression by increasing the level of corticosteroids which is a stress hormone as in accordance with Gauly et al. (2006). Mortality in 6 months to 1 year may be higher due to over eating of green pasture by rapidly growing lambs leading to more access to parasitic infestation and also due to accumulation of undigested starch and carbohydrates in rumen provide a favourable medium for enterotoxemia while younger lambs < 2 months are dependent on mother's milk/colostrum before weaning, lack exposure to parasitic infestation due to nonfeeding or overfeeding of pasture. Catarrhal enteritis was the most common post-mortem

Table 2. Gross pathological changes observed at post mortem examination of sheep/lambs.

Gross changes	Intestine	Liver	Pancreas	Mesenteric lymph nodes	Abomasum
Congestion	9	4	1	-	5
Haemorrhages	-	-	-	-	-
Necrotic Foci	-	3	-	-	-
Catarrhal enteritis	5	-	-	-	-

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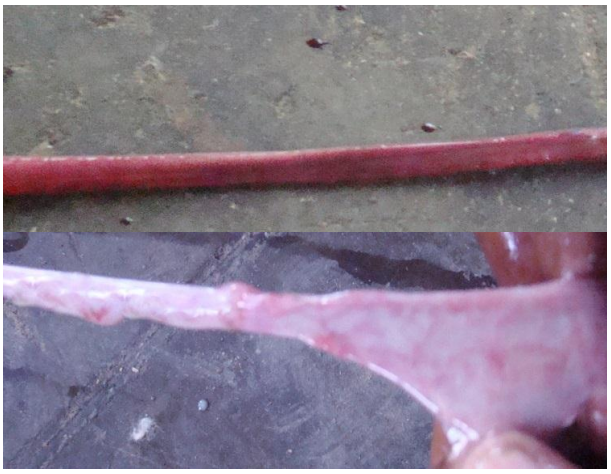

Figure 1. Photograph of intestine showing mild and severe congestion.

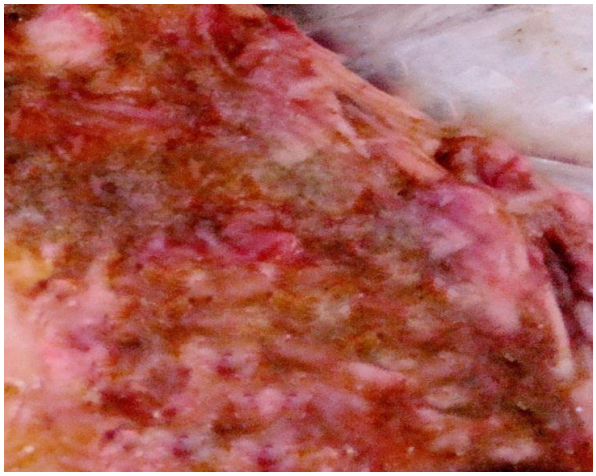

Figure 2. Photograph showing abomasitis due to hemonchosis.

observations in gastrointestinal tract of infected sheep/lambs. These findings were in accordance with reports of Saleim et al. (2004) and Rao et al. (1980). In abomasum, congestion in mucosa and submucosa (Figure 6) observed which were similar to findings of Panisup (1974), Gough and McEcwen (2000), Saleim

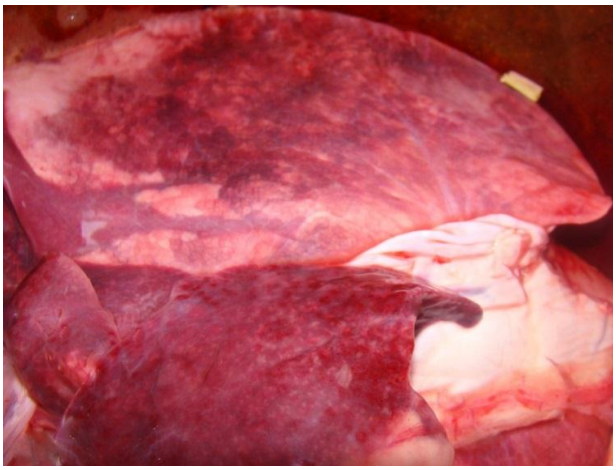

Figure 3. Photograph showing severe congestion (red hepatization) in liver.

Figure 4. Photograph of intestine showing catarrhal type of inflammation.

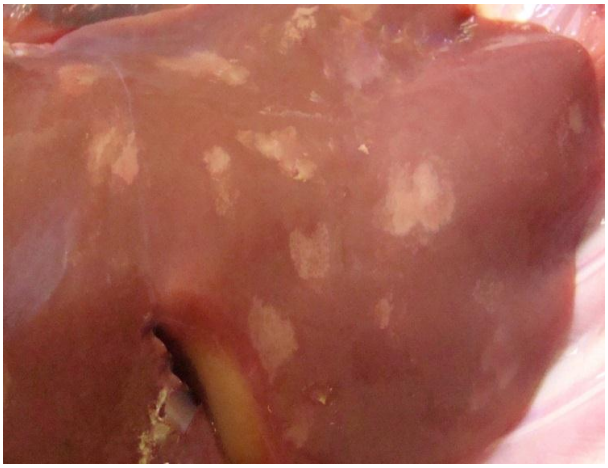

Figure 5. Photograph showing necrotic foci on liver.

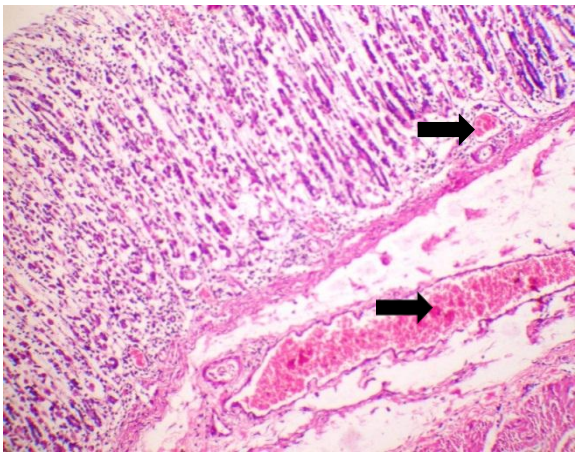

Figure 6. Photomicrograph of abomasum showing congestion in mucosa and submucosa (H&E X100).

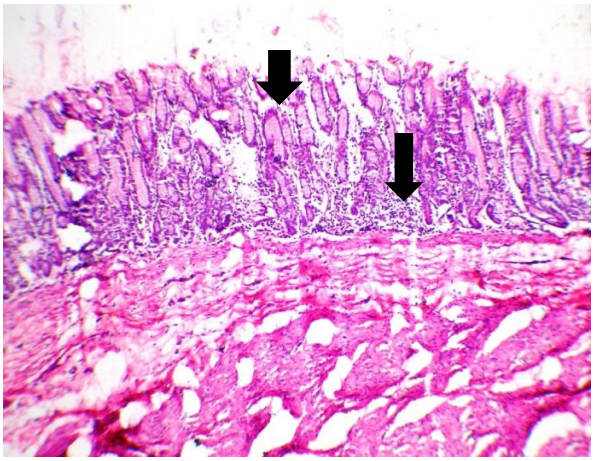

Figure 7. Photomicrograph of intestine showing hyperplasia of goblet cell and mucosal gland filled with leucocytes (H&E X100).

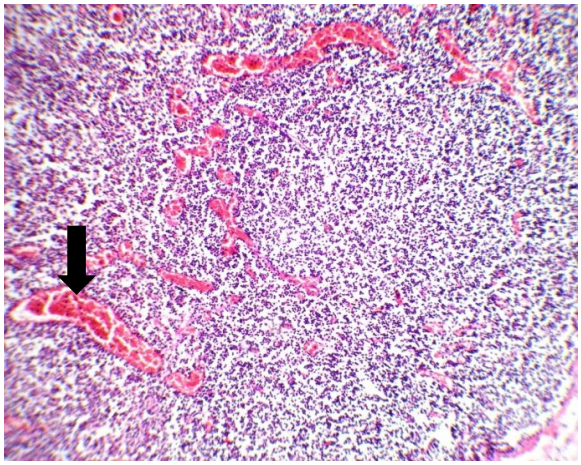

Figure 8. Photomicrograph of mesenteric lymph node showing severe congestion in cortex (H&E X100).

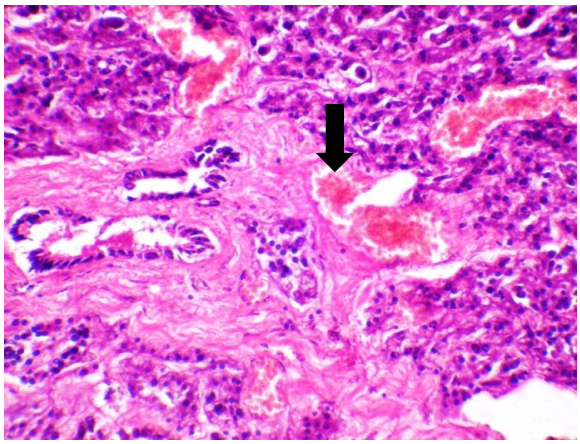

Figure 9. Photomicrograph of pancreas showing congestion with mild necrosis of acinar cells (H&E X400).

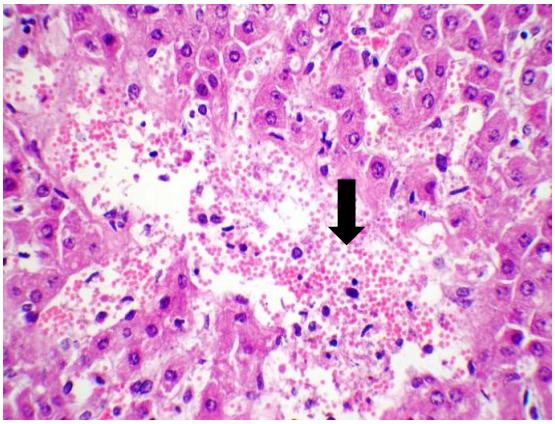

Figure 12. Photomicrograph of liver showing haemorrhage in hepatocytes (H&E X400).

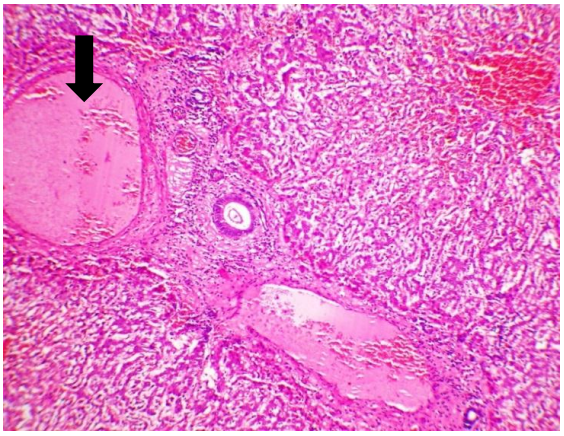

Figure 10. Photomicrograph of liver showing thrombosis in portal vessel (H&E X100).

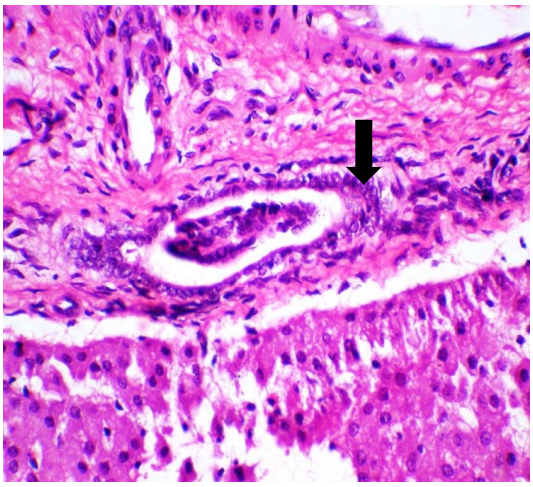

Figure 13. Photomicrograph showing hyperplasia of bile duct (H&E X400).

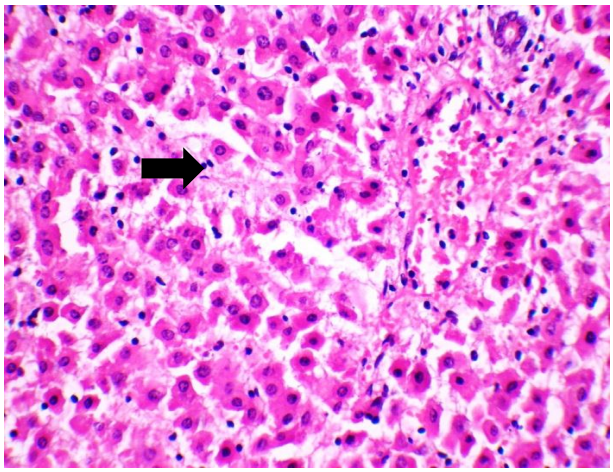

Figure 11. Photomicrograph showing cloudy swelling and congestion of portal vessel of liver (H&E X400).

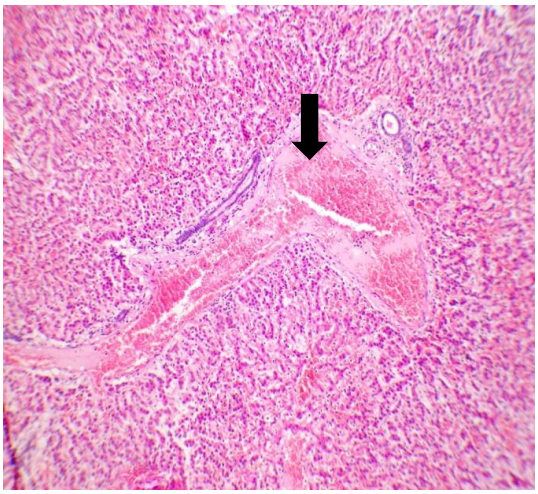

Figure 14. Photomicrograph of liver showing centrilobular necrosis (H&E X100).

et al. (2004) and Tariq et al. (2008). Bile duct hyperplasia (Figure 13) and necrotic changes in parenchyma along with centrilobular necrosis in parenchyma (Figure 14) were in accordance to observation of Saleim et al. (2004). Abomasitis may be due to gastrointestinal parasitism (*Haemonchus contortus*) which increases the serum pepsinogen and gastrin secretion by loss of parietal cell and mucous cell hyperplasia. This further results in secretion of secretory products provoking inflammation and damages abomasal mucosa (Hajimohammadi et al., 2010).

Conflict of Interest

The authors have not declared any conflict of interest.

ACKNOWLEDGEMENT

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