STUDY OF HISTOARCHITECTURE OF LARGE INTESTINE IN GOAT

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ABSTRACT

The present study was conducted on large intestine of six adult goats. The large intestine comprised three parts i.e. caecum, colon and rectum. Four types of layers are present throughout large intestine; these are tunica mucosa, tela submucosa, tunica muscularis and tunica serosa. Tunica mucosa contained simple columnar epithelium with striated border, lamina propria with intestinal glands, lymphatic nodules and lamina muscularis. Intestinal glands are lined by tall columnar cells and exhibited secretory activity with bluish-black appearance in the lumen and mostly serous secreting. Goblet cells are highest in the rectum. Lymphatic nodules in colon show lacteal duct and present at the base region of tunica mucosa.

INTRODUCTION

The great almighty ‘Nature’ has created many complex creatures, which satisfies their bodily requirements through different systems in all biotic creations. The digestive system is the only system, which satisfies energy need of body through absorption of nutrients and thus it makes the powerful relation with nature by digesting various types of feed, which are digestible to specific animals. Large intestine is the termination of the ileum to the anus. The function of large intestine is absorption of considerable quantity of water, vitamins and electrolytes and production of mucus. In the present study, the histological study of large intestine in goat was aimed.

MATERIAL AND METHODS

The large intestine of six adult cattle of local non-discript breed were collected from local slaughterhouse. The parts of large intestine were brought to the laboratory, cleaned under running tap water and fixed in 10% formal saline. These parts were processed through graded alcohol for dehydration, cleared in xylene and embedded in paraffin. The tissue sections of 5 mm thickness were obtained by manually operated microtome machine. These sections were stained by following staining methods.

A) Harris’s Haematoxyline and Eosin for general histological observations (Mukherjee, 1990).
B) Silver Impregnation stain method for reticulin (Mukherjee, 1990).
C) Verhoeff’s stain for reticular and elastic fibers (Mukherjee, 1990).
D) Crossman’s modification for Mallory’s triple stain for collagen and elastic fiber (Singh and Sulochana, 1978).
F) McManus Periodic Acid Schiff’s (PAS) reaction stain for carbohydrate like glycogen, reticulin and mucin (Mukherjee, 1990).
G) Mowry’s colloidal Iron stain for demonstration of mucoprotein, neutral and acid polysaccharides (Singh and Sulochana, 1978).

RESULTS AND DISCUSSION

Large intestine of goat consisted three parts i.e. caecum, colon and rectum. Four types of layers are present in all three parts of large intestine; these are Tunica mucosa, Tela submucosa, Tunica muscularis and Tunica serosa (Plate 1, 2, 3).
Plate 1. Microphotograph showing histological structure of cecum in goat
A) Tunica mucosa; B) Tela submucosa; C) Tunica muscularis; D) Artery
(H and E stain - 100x)

Plate 2. Microphotograph showing histological structure of colon in goat:
A) Lacteal duct; B) Lymphatic duct; C) Artery; D) Mucosal fold;
E) Tunica serosa; F) Epithelial border; G) Tunica muscularis
(H and E stain - 100x)
Plate 3. Microphotograph showing histological structure of rectum in goat:
A) Lymphatic nodule; B) Lamina muscularis; C) Tela Submucosa; D) Tunica serosa; E) Artery
(H and E stain - 100x)

Tunica mucosa consisted simple columnar epithelium with striated border, lamina propria with intestinal glands and lamina muscularis (Plate 2). Large intestine of goat was characterized by the presence of longitudinal folds, absence of villi and the straighter, longer, tortuous, mucous and serous secreting glands lined with large number of goblet cells. Lamina propria consisted collagen and elastic fibers with blood vessels. Lymphatic nodules are also present in the lamina propria (Plate 2, 3). Intestinal glands in caecum are oval, tortuous, straight, not densely packed, mucous secreting which are located at the close vicinity of lamina muscularis and serous secreting glands are present at the apical end of Tunica mucosa. In colon intestinal glands are straight, tortuous, tubular present at the base region of lamina muscularis. In rectum, glands exhibited secretory activity, bleblack appearance in the lumen and mostly serous secreting which are located at the apical end of tunica mucosa. Tall columnar cells, goblet cells and argentaffin cells line these glands. Number of goblet cells are highest in rectum than caecum and colon.

Lamina muscularis was composed of inner circular and outer longitudinal layers of smooth muscle and these are thin and incomplete. There was a large venous plexus in the lamina propria near the junction of rectum with anus. Lymphatic nodules present at the base region of tunica mucosa in colon, it shows lacteal duct (Plate 2). Raghavan (1964), Getty (1975), Ghosh (1995), Bacha and Bacha (2000) in ruminants observed similar findings of tunica mucosa as in the present study.

Histological findings of intestinal glands of large intestine lined by absorptive columnar cells and number of goblet cells in the present study was also reported by Maala...
and Cumming (1985) in bovine and Estacio and Maala (1996) in philipine carabao. Ramkrishna and Gadre (1998) has similar findings as in the present study that lamina muscularis consisted inner circular and outer longitudinal layers of smooth muscle.

Tela submucosa located between lamina muscularies and tunica muscularis (Plate 3). It consisted collagen and elastic fiber bundles. Blood vessels and nerve fibers are also present in tela submucosa. Tunica muscularis comprised inner circular and outer longitudinal smooth muscle layer, out of which outer muscle layer contains more elastic tissue than the inner layer. Similar observation of tunica muscularis was also reported by Dellmann and Brown (1987) in ruminants.

Tunica serosa was a loose connective tissue layer consisted of collagen and elastic fibers. Blood vessels are also present in tunica serosa (Plate 3). In goat the retroperitoneal portion of rectum lacks a serosa. Dellmann and Brown (1987) also reported similar observations of tunica serosa as in the present study.

REFERENCES