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Histopathological Changes In Intestine Of Capra Hircus Due To Helminth Infection From Aurangabad.

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Abstract: Gastrointestinal parasitism, particularly nematode infection, is a major health issue affecting goats worldwide, resulting in clinical diseases and productivity loss. The parasites causes localized and generalized infections to the host depends on the parasite attachment organs, depth of penetration, site of location and worm burdens. Histopathological study was carried out to know the burden and severity of infection.

Keywords: Parasitism, infection, histopathology.

INTRODUCTION

Small ruminants are important source of income for rural communities whose livelihood is largely based on livestock production (Sharma et al., 2015). These animals produce milk, wool, manure, leather and meat with minimum maintenance charges. They are also source of cash income for farmers at the time of need.). Control of internal parasites, especially gastrointestinal nematodes is a primary concern for many livestock farmers and is particularly challenging in humid regions. Grazing animals ingest infective larvae from grass and shorter forages. The larvae develop into adult parasites feed on blood in the abomasum and lay their eggs, which are excreted in the ruminants faeces. The life cycle continues when the eggs hatch and larvae develop on pasture, where they can be ingested by grazing ruminants (Blackburn et al., 2011). Intestinal parasites have become more difficult to manage in small ruminants because of the parasite increasing resistance to several antihelminthics (Magona et al., 2011). Parasite problems negativity impact the animal's health, reduce productivity and increase treatment costs. The repercussion of internal parasite infection includes treatment expenses, reduced animal weight gains and performance, and even animal death. The losses caused by parasites can be distinguished into direct and indirect losses (Lüscher et al., 2005). Direct losses include those due to acute illness and death and damage condemnation of organs and cost of dead animal inspection, while indirect losses include the decreases in productive potential such as decreased growth rate, weight loss in young growing animals and late maturity of slaughter stock (Blackburn et al., 2011).

MATERIALS AND METHODS

Intestinal samples were collected from slaughter houses of Aurangabad city and dissected to study histopathological changes in them. Some intestines were found to be infected and some are normal. Both infected and normal intestines were dissected and fixed in Bouin's fluid to study histopathological changes. The fixed materials from Bouins fluid were removed, washed, dehydrated through alcoholic grades, cleared in xylene and embedded in paraffin wax (58-62℃). The blocks were cut at 9µ and slides were stained PAS staining method was used. Best slides or sections were selected and observed under the microscope for histopathological study.

OBSERVATIONS

In Figure 1 , infected and non-infected intestine is seen. In figure 2, photomicrograph of infected intestine at 200micrometer is shown.

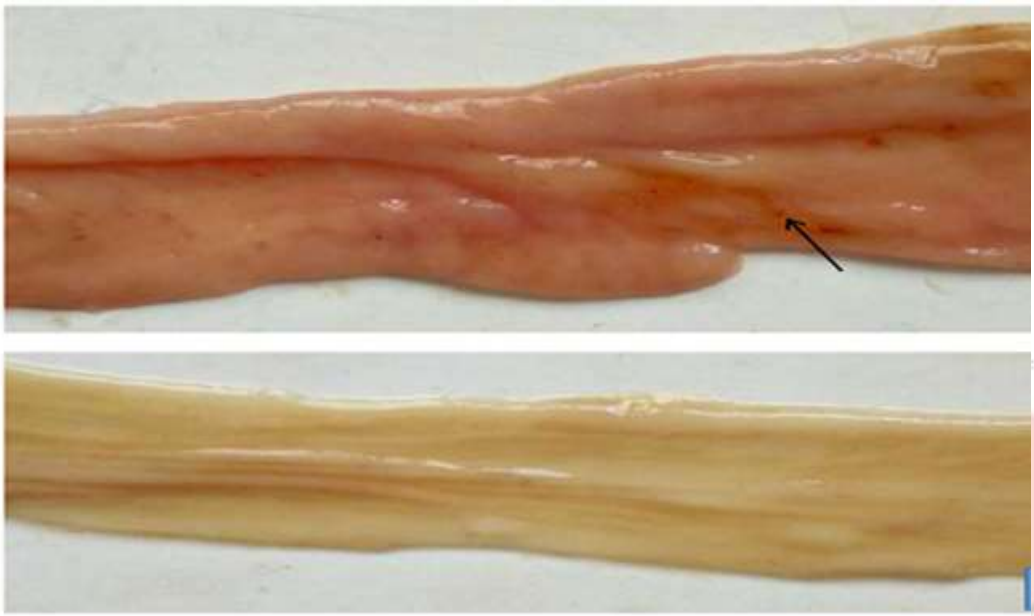

Fig:1 Infected intestine on top and non-infected intestine below.

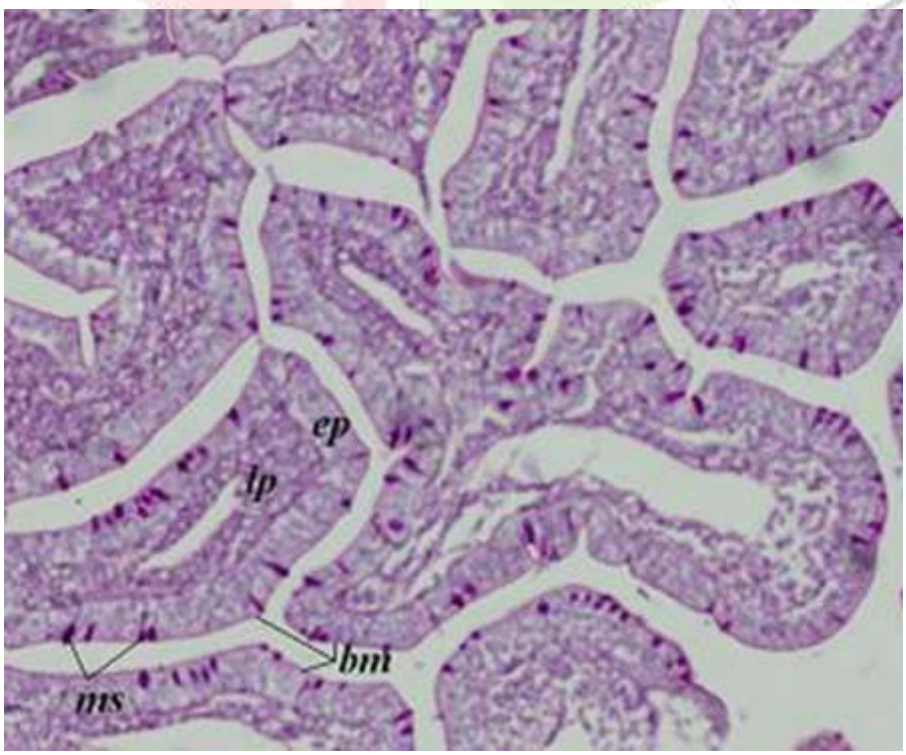

Fig: 2 Infected intestine at 200 micrometer

- Infiltration of inflammatory cells, including eosinophils, lymphocytes, plasma cells, and macrophages can be seen into the mucosa and submucosa.
- Granulomas were formed around parasite eggs or larval stages, involving macrophages and multinucleated giant cells.
- The villi in the intestines were found shortened or blunted, reducing the surface area available for nutrient absorption. Crypts were elongated. Erosion of epithelial lining not observed.
- Blood vessels in the submucosa show congestion, as blood flow is altered by the inflammatory response and the physical presence of the parasites.
- Mucosal lining is thickened.
- Necrosis and hyperplasticity observed.

RESULTS AND DISCUSSION

The alterations caused by Helminth infection have been studied by many researchers earlier. Ahuwalia(1960) studied histopathology of *Gastrodicoides hominis* a digenean trematode of pig and reported leucocytic infiltration and mucosal epithelium destruction. The partial
obliteration of villus structure and superficial necrosis was recorded by Bystrova and Davydov (1966) in the intestine of sheep infected with *Moniezia expansa*. Haque and Siddiqui (1978) reported infection of *Fasciolopsis buski* causing surface desquamation and destruction of mucosal epithelium, infiltration of eosinophils and plasma cells. Kapustina (1978) reported damage to intestinal mucosa adjacent to the strobila of *K. sinensis*, which was attributed to cestode feeding strategies, migration of parasite in gut, and sites of attachment. Haemorrhages and diffuse cellular infiltration of the lining epithelium were described by Avastthi *et al* (1981). Bilqees (1995) studied histopathology of fish
parasites. Histopathology of stomach of *Cybium guttatum* associated with nematode larvae was reported by Bilqees and Parveen (1996). Nasira Khatoon (2004) reported histopathologic alterations associated with *Syphacia* sp.in the intestine of *Nesokia indica* and observed total destruction and necrosis of all layers of intestinal wall and severe destruction occurs only in mucosa and submucosa.
Nanware *et al* (2005) reported vasodilatation of intestinal tissue of *Carcharias acutus* by *Phoreobothrium* sp. and intestinal villi disturbed by invasion of Scolex of *Moniezia* inhabiting intestinal tract of *Capra hircus*. Gupta and Srivastava (2007) observed heavy infection of *Fasciolopsis buski* damaging lamina propria, submucosa and mucosa with profuse infiltration of eosinophils, lymphocytes and plasma cells of pig intestinal tissue. Jadhav *et al* (2008) reported intestinal histopathology of *Gallus gallus domesticus* parasitized by *Davainea* sp. Khadap (2009) reported plug formation at ruptured epithelial portion which may have formed from lymphocytes and eosinophilic cells of intestinal tissue of *Gallus domesticus* parasitized by *Cotugnia*. Pathan *et al* (2011) noticed infected intestinal tissue of *Aetomylaeus nichoffii* gets broken due to penetration of hooks and formed ulcer parasitized by *Uncibilocularis* sp. Intestinal histopathology of *Capra hircus* L. infected by *Stilesia* sp. has been studied by Nanware and Bhure (2011, 2013). Mir *et al* (2013) noticed histopathological study of infected tissues of goat with *Moniezia expansa* revealed shortened and flattened villi, local haemorrhages and luminal site of duodenum was found to be depressed like cavity because of *Moniezia expansa*. Similar abnormalities were observed in the present study. Laxma Reddy *et al* (2014) recorded damage of the villi, inflammation, fibrosis associated with hyperplasia and metaplasia epithelial necrosis, vacuolation of submucous cells and dilation of blood vessels of *Channa punctatus* parasitized by *Genarchopsis goppo*. Our histopathological study is quite in agreement with Nanware *et al* (2005), Gupta and Srivastava (2007), Mir *et al* (2013) reported changes in intestinal tissues infected with helminth. These findings indicate more or less similar trend of histopathological changes in all the cases studied. It is evident from the overall study that, parasite derives nutritive material for its nourishment and growth from host tissue by causing damage to it. Pathological state of host alters the levels of various metabolites in the body resulting in change of metabolic activities and physiological activities of host. The present findings suggest that there is need for systematic chemotherapeutic and prophylactic strategies for control of helminth infection of domestic goat *Capra hircus* L.

CONCLUSION

These histopathological changes can severely impact nutrient absorption and lead to malnutrition, anemia (especially with blood-feeding helminths), and protein loss. Chronic infection and damage may lead to weight loss, reduced productivity, and, in extreme cases, death if untreated.

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