Gross and histopathological observations on gastro-intestinal helminthosis in camels

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Abstract

The present study was conducted to observe the gross and microscopic changes in gastro-intestinal tract during helminth infestation in camels. Grossly, abomasum showed varying degrees of ulceration, congestion of mucosa, thickened walls and oedematous folds associated with haemorrhagic foci due to presence of *Haemonchus* spp. worms. Histopathologically, abomasum revealed hyperemic mucosa and the hyperplasia of the glands with cellular infiltration mainly of lymphocytes and eosinophils. Small intestine infected with *Strongyloides* spp. and *Trichostrongylus* spp. worms showed oedematous and congested mucosa with few petechial haemorrhages. Histopathologically, the loss of villi, thickened mucosa and heavy infiltration of inflammatory cells in the mucosa and sub-mucosa of the duodenum were observed. Large intestine infected with *Trichuris* spp. revealed thickened and oedematous mucosa with focal haemorrhages. There was ulcer and nodule formation with thickening of the caecal wall. Microscopically, intestine revealed catarrhal inflammation and necrosis of gland with eosinophilic infiltration. The results revealed that the overall prevalence of helminthic infection was 68.01 per cent.

Keywords: Camel, histopathology, helminthosis, intestine

Introduction

The camel forms an integral part of the culture and agriculture of many countries since thousands of years (Dorman, 1986). Camels play many significant roles in social and economic development for people in numerous countries. Pathogenic diseases, poor nutrition and traditional management systems have restricted their full utilization. The camel has been considered an aid to man for thousands of years in many different respects by providing meat, milk and wool as well as transportation and labor. Despite being usually reared under harsh environment, unsuitable for propagation and transmission of helminths, camels are capable of harbouring a fairly large variety of these parasites. Helminth infestation is very much prevalent in camel and it imposes considerable constraints on camel health and production, thereby causing economical losses to camel owners. Moreover, few studies have been conducted on gastro-intestinal tract (GIT) helminths of camels (Bekele, 2002). *Haemonchus longistipes* is the most pathogenic *Strongyle* nematode of camels that may be associated with clinical disease and can be fatal. *Trichostrongylus* spp. may contribute to the debilitating effects (Soulsby, 2006). The damage caused by helminths (nematodes) included abundant mucus secreting gastric cells, flattening of the mucosa, villous atrophy, haemorrhages and cellular infiltration, mainly of eosinophils. These lesions could reduce the productivity of the infected dromedary through disturbance of intestinal absorption (McGavin and Zachary, 2007). Pathological effects of infestation lead to reduction in the quality and quantity of meat and wool by reducing appetite and causing poor utilization of nutritional substances, which may lead to low fertility, abortion and death (Windsor *et al.*, 1992; Leguia, 1991). Anaemia is one of the pathogenic effects of gastrointestinal parasites (Soulsby, 2006). This study, therefore, aims at highlighting the gross and histopathological changes in camels infected with gastro-intestinal helminths.

Materials and Methods

The study was undertaken for the period of twelve months from June, 2008 to May, 2009 to reveal...
the helminthic infection in faecal samples of camels. The specimens for the proposed investigation were collected from the carcasses of camel irrespective of sex, age and breeds. Entire gastrointestinal tract of fifteen carcasses were collected and examined for the presence of helminths. The gross characteristics of the lesions were described and recorded. Selectively, tissue specimens were collected, preserved in 10 per cent formalin solution and processed by routine paraffin embedding technique. The paraffin sections of 6-8 µm thickness were cut and stained by routine Mayer’s Haematoxylin and Eosin staining method.

Results and Discussion

*Haemonchus* spp. worms were identified from abomasum. Macroscopic lesions caused by *Haemonchus* spp. included thickened walls and oedematous folds associated with focal areas of haemorrhages. Abomasum showed varying degrees of ulceration and congestion of the mucosa. Histologically, there were inflammatory reactions mainly of lymphocytes and eosinophils and hyperemia in the abomasal mucosa with hyperplasia of abomasal glands of infected animals (Fig. 1). There was sloughing of epithelium, dilated and elongated glands with necrosis of the same in some cases with infiltration of inflammatory cells. Similar observations were also made by Borji et al. (2010). Abomasum also had varying degrees of ulceration due to feeding of *Haemonchus* spp. worms and congestion of mucosa has been described by various researchers (Graber, 1979; Arzoun et al., 1984; Jacquiet, 1995; Bekele, 2002). The sloughing of epithelium, dilated and elongated glands with necrosis with infiltration of inflammatory cells was also noted as reported by Bekele (2002) in camels in Ethiopia. *Strongyloides* spp. and *Trichostrongylus* spp. worms were identified from small intestine. Grossly, small intestine infected with these worms showed small petechial haemorrhages and the mucosa was oedematous and congested. Histopathological study revealed loss of intestinal villi with eosinophilic infiltration. There was thickened mucosa with infiltration of inflammatory cells in duodenum. There was heavy infiltration of inflammatory cells in the mucosa and sub-mucosa (Fig. 2). There was sloughing of epithelium and hyperplasia of duodenal glands (Fig. 3 and 4). There was villous atrophy and the loss of villi with inflammatory reactions in the lamina propria. Necrosis of glands and haemorrhages with elongated crypts were the major lesions encountered. The present histopathological findings remain in agreement with the findings of earlier workers (Tafti et al., 2001; Borji et al., 2010). Areas of haematoma and congestion of mucosa of small intestine due to presence of these worms were also noted. There was thickened mucosa with infiltration of inflammatory cells in duodenum. There was necrosis of glands and haemorrhages with elongated crypts as reported earlier by Bekele (2002).

*Trichuris* spp. worms were mainly identified from large intestine. Infection of *Trichuris* spp. in large intestine caused thickening of mucosa with haemorrhagic foci. *Trichuris* spp. of nematode attached in haemorrhagic lesions with oedematous mucosa was the main finding. Grossly, large intestine showed congestion and haemorrhagic spots, ulcers formation and nodule formation with thickening of the caecal wall. Histopathological study of intestine revealed catarrhal inflammation and necrosis of glands.

![Fig 1: Hyperplasia of abomasal glands (H&E, 100 X)](image1)

![Fig 2: Sub-mucosal infiltration in duodenum (H&E, 100 X)](image2)
The study also revealed disruption of epithelium of intestinal villi with eosinophilic infiltration. Large intestinal mucosa showed desquamation of epithelium. There was flattened epithelium with a few dilated glands and hyperemia with moderate increase in inflammatory cells composed of lymphocytes and eosinophils. Similar lesions were also reported earlier by Levine (1968), El Bihari, (1985), Nafady et al. (1997), Tafti et al. (2001), Chhabra and Gupta (2006) and Borji et al. (2010).

Haemonchus spp., Trichostrongylus spp., Strogyloides spp. and Trichuris spp. worms were also recovered from digestive tract content of camel by many workers (Altaif, 1974; El Bihari, 1985; Abdul-Salam and Farah, 1988; Magzoub et al., 1997; Anwar and Hayat, 1999; Tekle and Abebe, 2001; Bekele, 2002; Tembely et al., 2002; Eslami et al., 2003 and Borji et al., 2010).

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References


