OCCURRENCE AND PATHTHOLOGY OF UPPER GASTROINTESTINAL PARASITES IN CAMEL (CAMELUS DROMEDARIES)*

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ABSTRACT

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Samples of tongue, oesophagus and stomach compartments of 246 camels (Camelus dromedaries) from western Rajasthan were examined between February 2014 to January 2015. By gross and histopathological examination 21.78% of suspected samples were found positive for parasites. Sarcocystis in tongue (5.12%), in oesophagus (10.25%) and Haemonchus species worms in abomasum (6.41%) were found in the upper gastrointestinal tract of camel. In sarcosporidiosis, different sized dark stained sarcocysts in between muscle bundles of oesophagus and tongue were seen with the mild cellular infiltration mainly of eosinophilic granulocytes surrounding the lesions. Haemonchus longistipes infected abomasum showed thickened wall and oedematous folds with focal areas of haemorrhage with reddish thread like Haemonchus spp. worms between mucosal folds. Histologically, abomasum showed marked haemorrhages and congestion between gastric glands and hyperplasia of gastric glands with infiltration of eosinophils, lymphocytes and macrophages. These lesions could reduce the productivity of the infested dromedary. In conclusion, strategic deworming of camel using broad-spectrum anthelmintics is necessary to increase the productivity of camels.

Key words: Camel, parasites, occurrence, histopathology, Rajasthan

Introduction

The camel (Camelus dromedarius) has an important place in the desert ecosystem. This species is uniquely adapted to hot and desert travel, that’s why it is known as “Ship of the desert”. The camel tolerates high temperature, solar radiation and water deprivation. The temperature of skin remain cool due to coarse and well ventilated hairs on its back which allow evaporation to take place on the surface of the skin (Mathur et al., 2013). In the present context, the camel is not only a draught species but also used for racing, desert safari, milk, meat, leather and it’s hair is also useful. Pathogenic diseases, poor nutrition and traditional management system have restricted their full utilization (Bekele, 2002). Gastrointestinal parasites injure their hosts by a wide variety of mechanisms, mainly reduction in voluntary food intake and loss of productivity. However, the clinical manifestation is subclinical or asymptomatic in which animals appear normal but are performing at below their full potential. Sarcocyst and Haemonchus longistipes are common parasites of upper gastrointestinal tract of camel. Haemonchus longistipes is the most pathogenic nematode of camel that may be associated with clinical disease and can be fatal. Anaemia is one of the pathogenic effects of gastrointestinal parasites. Moreover, few studies have been conducted on GI helminths of camels (El Bihari, 1985; Abdul-Mogod, 2001; Bekele, 2002). Hence, the present study was designed to provide preliminary information on the occurrence along with describing both gross and microscopic changes caused by these parasites of camels in Western Rajasthan.

Materials and Methods

Sampling and study area

For the present study, 246 samples of the upper gastro-intestinal tract were collected during February 2014 to January 2015 from carcasses of camels subjected to post-mortem examination to veterinary clinics of various districts of western Rajasthan and the upper gastro-intestinal tract samples of dead camels from Municipal Corporation. The tissue samples were also collected from the carcasses of camel submitted to the Department of Veterinary Pathology, College of Veterinary and Animal Science, Bikaner for routine post-mortem examinations. The samples received from the field veterinarians and Border Security Force (BSF), in the Department of Veterinary Pathology were also included in this study. All the samples were properly preserved in 10 per cent formal saline after cutting in to Individual parts.

Histopathological examination

For histopathological examination, processing of tissues done by paraffin embedding using acetone and benzene technique (Lille, 1965). The tissue sections of 4-6 micron were cut and stained with haematoxylin and eosin staining method as a routine. As far as possible the results were recorded by gross and microphotography.

Results and Discussion

In the present investigation, a total number of 246 specimens of upper gastro-intestinal tract of camel were examined irrespective of age, breeds and sex. Out of these, specimens suspected for abnormalities were further processed for histopathological examination in which 21.78% cases were positive for parasites. Sarcosporidiosis was observed in 5.12% cases in tongue and 10.25% cases in oesophagus. Nematodirosis was found in the 6.41% cases in abomasum of upper gastrointestinal tract of camel. In sarcosporidiosis, different sized dark stained sarcocysts in

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between muscle bundles of oesophagus were seen with the mild cellular infiltration mainly of eosinophilic granulocytes surrounding the lesions (Fig. 1). Each sarcocyst was surrounded by thin layer of muscle fibres which contain numerous bradyzoites.

In nematodiasis *Haemonchus* spp. infested abomasum showed thickened wall and oedematous folds with focal areas of haemorrhage. Abomasum showed varying degrees of ulceration and congestion of the mucosa with reddish thread like *Haemonchus* spp. worms between mucosal folds. Histologically, abomasums showed marked haemorrhages, congestion (Fig. 2) and hyperplasia of gastric glands with infiltration of eosinophils, lymphocytes and macrophages (Fig. 3).

Few studies have been conducted on the occurrence and pathological lesions of gastrointestinal parasites of dromedary (*Camelus dromedarius*) in Rajasthan. By gross and histopathological examination 21.78% of suspected specimens were found positive for parasites, in which sarcosporidiosis was 15.37% and nematodiasis was 6.41%. These findings are lower than those reported by Shekarforoush (2006), Borji et al. (2010) and Rajneesh et al. (2011). The difference in the incidence might be due to difference in environmental conditions and managemental conditions. There is paucity of literature as helminths infections of camels are generally regarded as less of a problem than those in other ruminants. However, gastrointestinal nematodes are known to undermine the overall health and productivity of camels. *Haemonchus longistipes* is the most pathogenic strongyle nematode of camels that may be associated with clinical disease and can be fatal. The damage caused by these nematodes included abundant mucus secreting gastric cells, flattening of the mucosa, villous atrophy, haemorrhages and cellular infiltration, mainly of eosinophile. *Haemonchus* spp. worms are voracious blood sucking abomasal nematode and its infestation most importantly reduces voluntary feed intake and increases endogenous losses of protein via excreta (Pathak and Tiwari, 2012). These lesions could reduce the productivity of the infected dromedary (McGavin and Zackary, 2007). In conclusion, the results of this study showed that strategic deworming of camel using broad-spectrum anthelmintics is necessary to increase the productivity of camels. Moreover, further epidemiological studies should be conducted in different seasons and regions of the state to provide more information about the seasonal dynamics of the gastrointestinal parasites of dromedary in Rajasthan.

**References**


