OCCURRENCE OF CIRCULATORY DISTURBANCES - A PATHOLOGICAL CONDITION OF INTESTINE IN DROMEDARY CAMEL

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ABSTRACT

The present study was undertaken during period of September 2013 to January 2014 to study occurrence and histopathology of various circulatory disturbances of intestine in camel. During study period a total of 172 samples of camel intestine, irrespective of age, sex and breeds were examined. Out of these samples, 103 (59.88%) showing frank gross lesions were collected and tissue sections from these samples were subjected to histopathological examination. Various circulatory disturbances of intestine were recorded in 37.86 per cent (39 out of 103). Gross examination showed distended venous network on serosal surface of intestine in congestion, brownish-red coloured streaks and petechie on the mucosal surface of intestine in haemorrhagic condition and thickened submucous tissues than normal tissues were observed in oedema. Microscopic examinations revealed predominance of engorged blood vessels in congestion, focal haemorrhagic infiltration of intestinal tissue in haemorrhagic condition and showed thickening and expansion of submucosa in oedematous changes.

Key words: Camel, circulatory disturbances, histopathology

Introduction

The camel (Camelus dromedarius) forms an integral part of the culture and agriculture of the fragile desert eco-system. With its unique biophysiological characteristics, the camel has become an icon of adaptation to challenging ways of living in arid and semi-arid regions. The camel is used as a beast of burden for transporting goods as well as people of desert area besides agricultural works. Milk is often the only regular food source for its owners. It is also used by border security forces for guarding the frontiers of our country. The camel has played a significant role in civil law and order, defence and battles from the ancient times till date (NRCC, VISION 2030). About 85% of the camel population inhabits mainly eastern and northern Africa and rest in Indian subcontinent and Middle East countries (NRCC, VISION 2030). The majority of world’s camel population is of dromedary type except small population of Bactrian camels in central Asia. 81.37% population of Indian dromedary camels is possessed by only Rajasthan (0.323 million) state and rest camel population is found in Gujarat, Haryana, Bihar and Uttar Pradesh (19th Indian livestock census, 2012). In Rajasthan, camel population has decreased by 35.23% over the previous two census and the total 0.323 million camels were left in 2012 (19th Livestock Census 2012) which were 0.498 million in 2003 (17th Livestock Census, 2003).

Although, camel is a well adapted animal for arid and semi-arid area but some time it also suffered from some gastrointestinal disturbances and diseases of gastro-intestinal system affects performance of the animal and it is also a challenge to the veterinarian to arrive at a definite diagnosis of a particular problem. The major etiological agents which are responsible for the cellular and vascular damage are physical, chemical, bacterial, viral, fungal and parasitic agents, the severity varying with nature of their lesions. Certain lesions that affect the intestine comprises of some frequently encountered diseases in clinical practice for instance infarcts, congestion, haemorrhage and oedema etc. In addition to circulatory disturbances, intestinal coccidiosis (Kinne et al., 2002), multicentric fibromyxoid peripheral nerve sheath tumour (Khodakaram-Tafti and Khordadmehr, 2011), para-tuberculosis (Alharbi et al., 2012), tuberculosis (Kasaye et al., 2013), haemorrhagic enteritis (Kumar et al., 2013), gastrointestinal parasitic infestation (Radfar and Aminzadeh Gowhari 2013; Duguma et al. 2014) and intestinal obstruction (Kumar et al., 2014), were also reported. Systematic studies on the histopathology of circulatory disturbances in camel were few and the published literature consists almost entirely on case reports hence, present research work was planned to study the occurrence and histopathology of circulatory disturbances in camels of western Rajasthan.

Materials and Methods

For the present study 172 samples of the intestinal tract were collected from camels of either sex, irrespective of age groups and breeds during the period of study from September, 2013 to January, 2014. Out of these, 103 samples showing gross lesions were used for further study. The tissue specimens for proposed investigation were collected from carcasses of camels subjected to post-mortem examination to various veterinary clinics of various districts of western Rajasthan (Bikaner, Jaisalmer, Jodhpur and Barmer) because majority of camel population 47.91 per cent (0.1560 million out of 0.3257 million) resides in these four districts (19th Livestock Census, 2012). The intestinal samples of dead camels from Municipal Corporation Bikaner and samples of camels submitted to the Department of Veterinary Pathology from Teaching Veterinary Clinical Complex, field veterinarians and...
Border Security Force (BSF) for routine post-mortem examinations were also included in this study. All the samples were collected in 10 per cent formal saline for histopathological examination. The tissues were processed mechanically for paraffin embedding by acetone and benzene technique (Lillie, 1965). The tissue sections of 4-6 micron thickness were cut and stained with H and E stain.

**Results and Discussion**

An overall incidence of circulatory disturbances conditions of intestinal tract was observed as 37.86 per cent (39 out of 103) corresponded well with the findings of Bhati (2008), recorded 34.39 per cent in buffaloes. These conditions were recorded as follows:

### Circulatory disturbances

I. **Congestion**

This condition was recorded in 27.18 per cent cases while Bhati (2008) reported 19.57 per cent case in buffaloes. In congestion grossly, serosal surface of intestine was distended, showing brownish red colour and distended venous network. These blood vessels were tortuous and filled with blood. The gross findings of congestion were, in close approximation to the findings recorded by Cohrs (1967) and RunnellIs et al. (1965). Microscopically, there was predominance of engorged blood vessels (Fig. 3) especially in the villi and submucosa and mucosa of intestine. Degenerative changes were seen in the epithelial lining of villi particularly near the tips. Cellular infiltration comprised mainly neutrophils and mononuclear leukocytes (Fig. 3). The microscopic findings were showing engorged blood vessels in mucosa and submucosa corresponded well with the reports of Cohrs (1967), RunnellIs et al. (1965), Sastry and Rao (2005).

II. **Haemorrhage**

This condition was recorded in 8.74 per cent cases in present study which is contrast to findings of Musken et al. (2007) who recorded 14 per cent incidence. The gross findings were brownish-red coloured streaks on the mucosa (Fig. 2), haemorrhagic mesenteric lymph nodes, presence of intraaluminal blood and petechiae over entire mucosa which were similar to the findings recorded by Nilo et al. (1974),

### Table 1: Different circulatory disturbances

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of condition</th>
<th>No. of sample</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Circulatory disturbances</td>
<td>39</td>
<td>37.86</td>
</tr>
<tr>
<td>I</td>
<td>Congestion</td>
<td>28</td>
<td>27.18</td>
</tr>
<tr>
<td>II</td>
<td>Haemorrhage</td>
<td>9</td>
<td>8.74</td>
</tr>
<tr>
<td>III</td>
<td>Oedema</td>
<td>2</td>
<td>1.94</td>
</tr>
</tbody>
</table>

![Fig. 1: Photograph of intestine showing thickened oedematous wall of intestine.](image1)

![Fig. 2: Photograph of intestine showing dark brownish-red haemorrhagic area on the mucosal surface of small intestine.](image2)

![Fig. 3: Section of intestine showing engorged blood in submucosa of intestine with infiltration of inflammatory cells in mucosa, (H & E, X100).](image3)

![Fig. 4: Section of intestine showing congested mucosa with infiltration of erythrocytes and inflammatory cells in mucosa, (H & E, X100).](image4)
Bekele et al. (2002) and Costa et al. (2009). The microscopic findings of haemorrhage such as congested blood vessels and focal haemorrhagic infiltration (Fig. 4) of tissue correspond well with the findings of Abutarbush and Radostits (2005).

III. Oedema

This condition was recorded in 1.94 per cent cases. Gross findings of oedema like thickened submucous tissue than normal submucous tissue (Fig. 1). These oedematous changes were in well agreement with findings recorded by Cohrs (1967), Tafti et al. (2001) and McGavin and Zachary (2007). Microscopic findings were pronounced oedematous changes in submucosa which thickens and expands submucosa with pink staining fluid correspond well with the reports of Konishi et al. (1975), Cheryl et al. (2001), Jubb et al. (2007) and McGavin and Zachary (2007).

Acknowledgements

The authors are highly thankful to Dean College of Veterinary and Animal Science, Bikaner for providing necessary facilities.

References
