Common Parasitic Diseases of Camel

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Introduction

Camel is a very hardy animal and well adapted anatomically as well as physiologically to harsh climatic conditions of desert Neverthless, it suffers from various endo and ecto-parasitic diseases which are major constraints in improvement of camel health. These diseases cause substantial economic losses in terms of decrease in working capacity, growth and productivity. With the introduction of sedentary, semi-intensive systems of camel farming, parasite may assume much more significant role in camel husbandry. In India no systematic study has been carried out so far regarding occurence of different parasitic diseases in camels in different geographical regions and their impact on economy of the farmers.

Helminthic Diseases

Though due to its typical browsing habit camel is less prone to helminthic disease, yet several parasites affect camel. The common gastro-intestinal nematodes of camel are *Haemonchus, Nematodirella, Nematodirus, Trichostrogylus, Strogyloides, Ostertagia, Marshallagia, Cooperia Trichuris* and *Camelostrongylus*. Maximum prevalence and intensity of these infections were observed in rainy season and minimum in summer season and age of the animal also plays significant role in acquiring these infections. Among GI nematodes, *Nematodirella* shows highest incidence throughout the year on organized farms, whereas in the field *Haemonchus spp.* is most common or the main causative agent of GI parasitic disorders. GI nematodiasis generally occurs in subclinical form in camels. The camel with moderate infection shows clinical symptoms like anorexia and weakness, whereas, with heavy infection shows anorexia, loss of body weight, loss of body condition, tough hair coat, anaemia, oedematous swellings of lower body parts and pica. Anthelmintics found effective are Fenbendazole, levamisole, tetramisole hydrochloride, morantel tartarate and ivermectin.

Among extra-intestinal nematodes, *Onchocercafasciata*, *O. armilata* and *O. gutturosa* have been reported in camels. *O. fasciata* produces subcutaneous nodules on the head and neck regions. The worm lie in the calcified or encapsulated nodules. The microfilariae are found in the skin in the region of head and neck. Another filarid worm, *Dipetalonema evansi*, occurs in the spermatic cord, pulmonary arterile, right auricle, lymphnodes and mesentry. The microfilariae are sheathed and found in the blood circulation. Clinical symptoms depend upon the location of adult worm. Hypertrophic slcerosis and aneurysm are the common lesions in this infection. Cases of Thelazia leesi (eye worm) infections are also not uncommon in camels.

Trematodes of major importance in camels are *Fasciola gigantica*, *F. hepatica*, *Schistosoma spp.*, *Eurytrema pancreaticum*, *Dicrocelium dendriticum* and *Paramphistomum spp*. These infections are very common after rainy season and in the areas particularly around canals. In fasciolosis, thickening of bile duct is the common lesion which may lead to digestive disorders.

Major cestodes which reported from camel in India are *Moniezia expansa*, *Stilesia vittata*, *Avitellina spp.*, *Hydatid cyst*, *Cysticercus tenuicollis* and *C. dromedarii*. These infections are usually not fatal in camels and detected at the time of post-mortem or by faecal examination.

Arthropod Infestation

Among ectoparasitic infestations, sarcoptic mange caused by *Sarcoptes scabiei var. cameli* is an emerging and serious problem in camels in India. The incidence and disease pattern depend upon seasonal conditions and vary from region to region. Maximum incidence is observed during the winter season particularly from December to April months. Age, nutritional status, overcrowding, debilitating condition due to trypanosomosis and worm burden are predisposing factors of sarcoptic mange in camels. Lesions mainly occur on face, inner surface of the

thighs, inguinal region and around the tail. There are loss of hair, scab formation, keratinization, proliferation of connective tissues, thickening and corrugation of skin. This disease is also of zoonotic nature. Camel owners are the main sufferers due to close association with camels.

Transmission of the disease occurs by direct contact or via fomites, such as blankets and baggage etc. Due to severe itching infected camels rub against their calves, other animal or trees and spread the disease. Affected camels become restless due to intense pruritis. They bite, scratch and rub the affected areas which may lead ot formation of large wound with maggot infestation and secondary bacterial infections. Diagnosis of the disease is made on the basis of clinical symptoms and by finding the different developmental stages of mite and their ova in skin scrapings. Deep skin scrapings should be taken from the edge of suspected lesion and valleys of corrugated or wrinkled skin. For treatment, taramera oil with sulphur, kerosene oil and coaltar are widely used in India. But, these are time and labour consuming and give unsatisfactory result. Some workers reported diazinon, amitraz, deltamethrin, and fenvalerate as 100% effective after three application. Recently, introduction of ivermectin therapy has shown excellent results in the treatment of mangy camels, but this drug is very expensive.

The commonly found ticks on camel in India are *Hyalomma dromedarii*, *H. anatolicum*, *H. marginatum isaaci*, *Rhipicephalus spp.*, *Ornithodoros spp*. etc. Heavy infections lead to decrease in draught capacity, milk production in lactating dams and growth rate in young animals. *Chrysomyia spp*. and *Wohlfahrtia magnifica* are the most important myiasis producing flies affecting camel and cause vaginal and preputial myiasis. *Cephalopina titilator* fly was found to cause nasal myiasis in camel.

Protozoan infections

Among protozoan infection *Trypanosoma evansi*, *Sarcocystis spp*. *Balantidium coli* and *Eimeria spp*. are commonly seen in camel. Out of these, *Trypanosoma evansi* is of major importance which has profound influence on camel health and cause huge losses to the camel owners. This protozoa is transmitted mechanically through blood sucking flies like *Tabanus, Stomoxys, Hippobosca, Lyperosia* and *Chrysops*. The incidence and severity of the disease vary in different geographical regions and are maximum during the period when fly breeding is maximum, particularly in the months of October and November. Due to introduction of Indira Gandhi Canal in the semi-arid region of Rajasthan geoclimatic conditions have changed and incidence of trypanosomiasis or "Surra" disease has incresed manifold in the areas around this canal. Trypanosomosis can attack camel at any stage of its life. All the age groups are affected but higher incidence is observed in growing camels that is, shortly after weaning. Trypanosomosis in camels usually occurs in chronic from but may be acute when the animal is under stress. Camel suffering from trypanosomosis exhibits clinical symptoms like increse in body temperature, anorexia and death in acute case while chronic form of the disease is associated with anaemia, emaciation, intermittent fever, loss of hair, oedema, restlessness and abortion. This disease generally persists for three or more years so, also called 'Tibersa'. Diagnosis can be made on the basis of clinical symptoms. But for accurate diagnosis blood smear examination, inoculation of blood from suspected animals into susceptible laboratory animal, serobiochemical tests such as formal gel test and mercuric chloride test and immunological tests such Enzyme immunoassays are used. Recently, antigen enzyme linked immunosorbent assay and polymerase chain reaction based assays have been found most sensitive and specific for the diagnosis of trypanosomosis. For treatment, quinapyramine methyl sulphate and quinapyramine methyl chloride are very effective and widely used for curative and prophylactic purposes, respectively.

Coccidiosis may be seen in young one with symptoms like diarrhoea and dysentry. There are also signs of dehydration, rough hair coat and anaemia. Infected camel acts as intermediate host for *Sarcocystosis spp*. The cyst develop in the gut of infected camel and can also be seen in muscles of heart, diaphragm nd oesophagus. The infection is non-pathogenic but has economic importance in countries where camel is used for meat purpose. *Toxoplasma gondii* infection occurs in camel through contaminated food and water. In India, infection rate of 11-19% with higher prevalence in older animals have been reported. Although no pathogenic effect has been reported due to this infection, but possibly it might cause abortion.

Diagnosis of Parasitic infestations

Clinical signs are often used in provisional diagnosis of parasitic infestation. The ova, larvae, trophozites passed in faeces, urine, nasal discharge or lacrymal discharge give indication of parasitic infection in the host. Most of protozoa are generally present in blood. The examination of such material is an aid to diagnosis of parasitic infestation like *hydatid cyst, Cysticercus tenuicollis* and *Sarcocystosis*. No ova, larvae or trophozite passed in body secretions and excretion. In these cases immunological tests are of great importance for diagnosis.

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