

## CO-OCCURRENCE OF JOHNE'S DISEASE ALONG WITH TAPEWORM INFESTATION IN GOATS: A CASE REPORT

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### SUMMARY

Suspected case of Johne's disease (Paratuberculosis) was observed in a herd of goat with clinical signs of chronic wasting like emaciation, chronic diarrhea, severe weakness, prostration and death even after standard treatment protocol. Soft pasty stool and/or profuse diarrhea were observed after several weeks of illness, in the terminal stages of the disease. Gross lesions were characterized by emaciation, caseous necrosis and calcification of mesenteric lymph nodes. calcification, mild thickening and corrugation of intestinal mucosa, caseous necrosis of Peyer's patches and ulceration. A confirmatory diagnosis was made on the basis of clinical signs and by identification of *M. paratuberculosis* in the intestine and mesenteric lymph node by Ziehl-Nielson stain.

**Keywords:** Caseous Lymphnode, Goat, Mycobacterium, Paratuberculosis, Tapeworm

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Johne's disease or Paratuberculosis is a chronic irreversible wasting gastro-enteric disease of ruminants (Geraghty *et al.*, 2014). It is characterized by chronic granulomatous enteritis and mesenteric lymphadenopathy with persistent diarrhea, progressive debilitation and poor response to therapy. The disease is well known in domestic ruminants. It has also been reported in wild and zoo ruminants and is prevalent worldwide (Salem *et al.*, 2013). In addition, calves remain as asymptomatic carriers for a period of 2 to 5 years. The causative agent is an acid-fast bacillus, *Mycobacterium avium* subsp. *paratuberculosis*. The affected ruminants remain as carriers for years and shed the organism via milk, colostrum and feces, and it subsequently contaminate feed and water (Facciuolo *et al.*, 2013). Paratuberculosis in animals exists in two distinct forms, the multibacillary or lepromatous form (Biplab *et al.*, 2010) and the paucibacillary form (Clark *et al.*, 2010). The disease is still incurable due to lack of proper therapies (Singh and Gopinath, 2011).

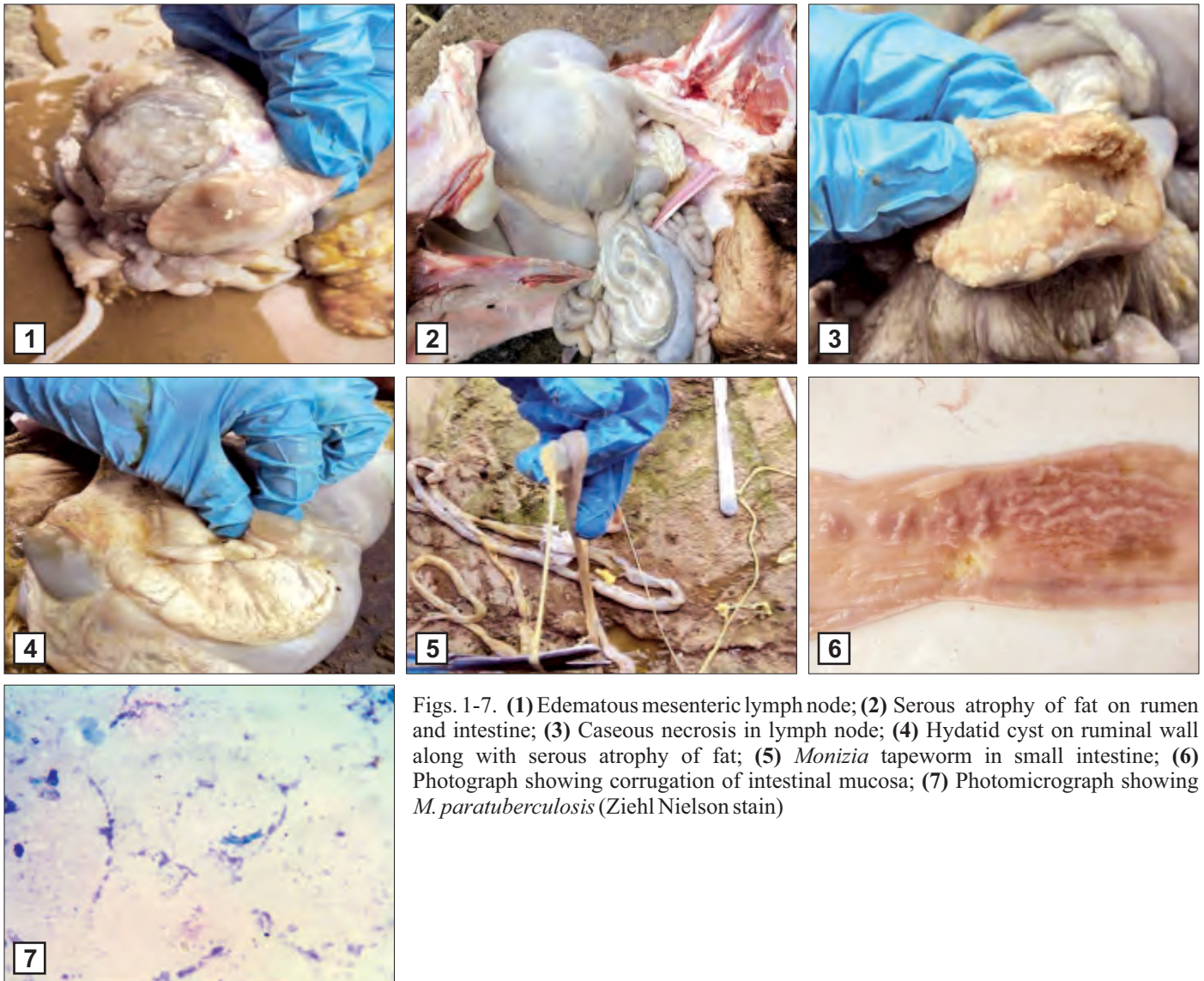
A wide array of procedures and laboratory tests ranging from conventional methods like Ziehl-Neelsen stained smears, skin sensitivity test, and histo-pathological analysis have been employed for diagnosis (Buergelt and Ginn, 2000).

Twelve adult goats reared as backyard farming in Rewa (Shilpara) at the farmer's door died during 2018 to 2020. The number of animals were different with each farmer. These animals did not respond to the standard treatment protocol. Necropsy was performed at department of Veterinary Pathology, Rewa, M.P. and organs like

intestine, mesenteric nodes, liver, kidney, spleen, lung and other organs were critically observed for gross lesions. Slides prepared from mesenteric lymph node were stained by Acid-fast stain (Ziehl-Neelsen stain).

Clinical signs reported in all goats were mainly those of a chronic wasting disease which lead to emaciation, severe weakness, rough and unthrifty hair coat, alopecia, prostration and death. The disease was characterized mainly by a progressive loss of weight and decreased milk production over a period of several weeks. Profuse diarrhea and/or soft pasty stool were observed only after several weeks of illness, in the terminal stages of the disease. Gastrointestinal parasitism particularly tapeworm (*Moniezia* spp.), was a common finding in these goats. The gross lesions observed were mainly emaciation and swollen, edematous mesenteric lymph nodes (Fig. 1) and serous atrophy of fat in rumen and intestine (Fig. 2). Small foci of caseous necrosis and calcification were also detectable in lymph nodes of nine animals (Fig. 3). A mild thickening and corrugation of the mucosa of distal small intestine, caecum and proximal parts of the colon which did not disappear by stretching, was observed in the affected animals. Caseous necrosis of Peyer's patches with ulceration of the overlying mucosa was also observed. The most important gross lesions observed were the mucosal corrugations of the ileum and jejunum as well as chronic lymphadenitis of the mesenteric lymph nodes. Hydatid cyst on ruminal wall along with serous atrophy of fat was also observed (Fig. 4). In addition, goats were also infected with tapeworms (*Moniezia* spp.) (Fig. 5) along with one small focal hemorrhagic lesion in mucosal wall of the caecum.

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Figs. 1-7. (1) Edematous mesenteric lymph node; (2) Serous atrophy of fat on rumen and intestine; (3) Caseous necrosis in lymph node; (4) Hydatid cyst on ruminal wall along with serous atrophy of fat; (5) *Monizia* tapeworm in small intestine; (6) Photograph showing corrugation of intestinal mucosa; (7) Photomicrograph showing *M. paratuberculosis* (Ziehl Nielson stain)

The corrugation in intestine has been observed at ileo-ceal junction (Fig. 6). A confirmatory diagnosis was made by identification of *M. paratuberculosis* by Ziehl-Nielsen stain (Fig. 7).

Johne's disease poses a significant economic and public health implication to humans and the animals (Gwozdz, 2008). Main reason is due to the unavailability of accurate tests to diagnose different stages of the Johne's disease, which in turn makes difficult for prevention and control of this disease (Britton *et al.*, 2015). The initial findings of this case report showed that the goat had a poor body condition, reduced appetite, severe weakness and emaciation. This is suggestive of a case of Johne's disease in ruminants. In addition, clinical findings of enlarged bilateral prescapular and prefemoral lymph node and profuse diarrhea and/or soft pasty stool were observed only after several weeks of illness. The most important gross lesions observed were the mucosal corrugations of the

ileum and jejunum (Fig. 6) as well as chronic lymphadenitis of the mesenteric lymph nodes. These lesions later spread to the jejunum, ileum, caecum, terminal end of the small intestine, colon and the mesenteric lymph node as the disease progresses (Sweeney *et al.*, 2012). The manifestation of these gross lesions leads to mal-absorption, protein leakage and subsequently severe weight loss (Clarke, 1997). In advance cases, edema of the submandibular and other dependent areas may be seen (Clarke, 1997). In this case, the clinical history stated that the farm may have a history of Johne's disease and it can be inferred that the goats might have been infected via contamination of feed with feces of shedders (Sweeney *et al.*, 2012).

The observations made on these goats indicate that veterinary pathologists must rule out Johne's disease in adult goats suffering from chronic wasting disease, with or without diarrhea. Consequently, the intestinal tract and mesenteric lymph nodes of affected goats should always be

examined carefully, because corrugation may or may not present. This is also true even when more evident problems such as caseous lymphadenitis or gastrointestinal parasitism are present. The culling of infected animals in a herd is one of the best control practices in order to prevent further contamination of farm.

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