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Medical management of *Moniezia expansa* infection in a buck: A case report

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Abstract

A male buck aged 16 months was presented to the Referral Veterinary Polyclinic, IVRI Izatnagar with the complaint of inappetence, diarrhea and chronic loss of weight. The hematological parameters did not show any significant alteration than the normal levels. The fecal examination has been shown positive for *Moniezia expansa* infection. The institution of treatment of buck via the combination of praziquantel and levamisole along with supportive therapy brought successful recovery in 2 weeks.

Keywords: Diarrhea, *Moniezia expansa*, praziquantel, levamisole

1. Introduction

Moniezia expansa which is also called as sheep tapeworm, double pored tapeworm and milk tapeworm is a very common parasite that infects sheep, as well as goat populations in the form of gastrointestinal tract (GIT) parasitism [5, 6, 11], leads to direct or indirect economic losses to the marginal farmers. The tapeworm in a large number cause mild enteritis, nutritional deprivation and sometimes intoxications. The eggs of *Moniezia expansa* are triangular shaped and each contains one embryonic tapeworm which is released in feces only after the rupturing of cooked rice shaped interproglottid gland that can be easily identified on direct fecal examination. The free-living forage mite or oribatid mites are the intermediate hosts that ingest ova and formation of cysticercoids in the body cavity after 111-120 days [9]. In lambs, *M. expansa* infections are usually mild and asymptomatic, but heavy infection may lead to intestinal obstruction, diarrhea and weight loss [2]. The combination of Praziquantel + Levamisole combination is highly effective in controlling and reducing the worm burden of *M. expansa* [12].

2. Methodology

2.1 Case History

A 16-month-old, a buck was presented to the Referral Veterinary Polyclinic, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly (U.P) with the history of inappetence, diarrhea and chronic weight loss along with the altered behavior. The buck was not dewormed and vaccinated as per standard regimen.

2.2 Clinical examinations and laboratory findings: Detailed examination revealed normal body temperature (102.1⁰F), the mucous membrane was pink, intact pupillary light reflex and menace reflex, heart rate (95 beats/min) and respiration rate (28 breaths/min) were within the normal range. All the hematological (Table.1) parameters are in normal range. The direct fecal examination showed the presence of the cooked rice shaped interproglottid gland (Fig.1) and triangularly shaped eggs (Fig.2) with pyriform apparatus which indicates that the animal is positive for *Moniezia expansa* infection with gastrointestinal complications.



Fig 1: Cooked rice shaped interproglottid gland

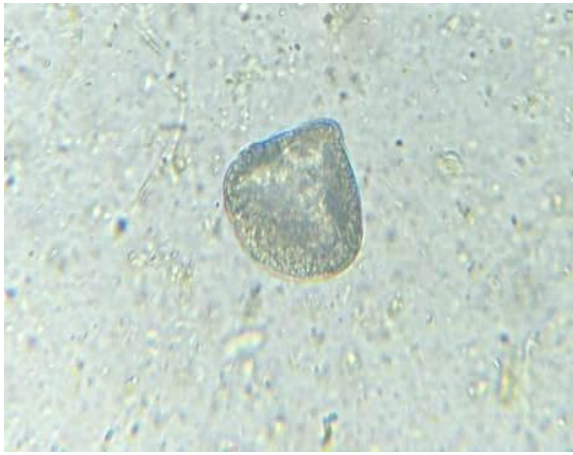


Fig 2: Triangular egg of *Moniezia expansa*

Table 1: The haematological parameters of infected goat

Parameter	Reference range ^[14]	0 day
Hb (g/dl)	8–12	11.6
TEC (10 ⁶ /cmm)	8–18	10.3
TLC (10 ³ /cmm)	4–13	8.99
Neutrophils %	30–48	38
Lymphocytes %	50–70	62
Monocytes%	0–4	0
Eosinophils%	1–8	0
Basophil%	0–1	0
Platelet count (10 ⁶ /cmm)	300–600	414

2.3 Treatment

Treatment was instituted with Praziquantel @ 3.75 mg/kg, PO, OD and Levamisole @ 7.5 mg/kg, PO, OD for 3 days along with supportive therapy of broad-spectrum antibiotic inj. Enrofloxacin @ 4 mg/kg, IM, BID, powder Neblon 20 gm, PO, TID for 3 days and vitamin B-complex and vitamin C (Becasule) 1 tsf PO OD for 2 weeks.

3. Results and discussion

The animals showed improvement from 3rd-day post-treatment and complete recovery was reported after 14 days of therapy. The animal was in normal condition with considerable improvement in its health within 1 week of treatment. On re-examination of fecal sample was negative for any parasitic egg or interproglottidal gland.

The adult sheep tapeworm is white in color and comprised of segments (egg packets) 1 to 1.5 cm wide, and a scolex (head) which is anchored to the intestinal wall found mostly in the small intestine. Their eggs are triangular in shape and can easily be identified on fecal examination. Each egg contains one embryonic tapeworm. *Moniezia spp.* infection is quite common in kids during their first year of life and relatively less common in older animals. Seasonal fluctuation in the incidence of *Moniezia spp.* infection can apparently be related to active periods of the forage oribatid mite vectors ^[10, 13] during the summer in temperate areas. Heavy infections were generally related to adverse clinical pictures such as poor growth rate, pot-belly, rough coat of hair and anemia ^[4]. This tapeworm is generally believed not to cause significant disease in sheep and goats. However, a severe infection can be associated with diarrhea and thriftiness, and occasionally the volume of parasites in the gut is associated with an intestinal blockage and may be a risk factor for *Clostridium perfringens* Type D infection (enterotoxemia). The complete life cycle requires two hosts, ruminants as definitive hosts, and oribatid mites as intermediate hosts ^[3, 10]. Eggs are passed

out from the intestine of the ruminant host along with the gravid proglottids in the feces into the soil. The eggs are eaten by soil mites. Eggs must reach the gut of mite hosts within 1 day of release otherwise they are desiccated. However, chances of development are very good as soil mites can be so numerous on a pasture that even if only 3% are infected (with 4–13 cysticercoids each), a grazing ruminant may ingest over 2,000 cysticercoids per kilogram of grass. Once inside the intestine of mites, the eggs hatch and the oncospheres penetrate into the hemocoel and develop to the cysticercoid stage. This stage may take up to 4 months. When the infected mite is eaten by the grazing ruminants, mature cysticercoids are digested out of the mite and develop into mature tapeworms in the small intestine within 5–6 weeks. Diagnosis is done by analysis of the fecal sample in which eggs can be detected or often observation of the cooked rice shaped gravid proglottids in feces. It should be pointed out that fecal egg estimation is not an accurate index of intensity of *Moniezia* infection in ruminants since eggs are present in feces only after the proglottides have ruptured. In the present case also the quantum of infection was not correlated to the presence of eggs in feces.

The affected animal was successfully treated with the combination of praziquantel and levamisole. The same result has been reported by South worth, 1996 that praziquantel @ 3.75 mg/kg orally along with levamisole 7.5mg/kg lead to complete removal of segments of *Moniezia expansa*. Praziquantel is active against a wide range of larval and adult cestodes that leads to very rapid contraction and vacuolization of the tegument, inhibition of glucose uptake and the decrease in glycogen content ^[1]. Levamisole works as a ganglionic stimulant (cholinomimetic) causing paralysis which leads to passive elimination of worms and inhibition of fumarate reductase enzyme leading to depletion of metabolic energy availability to both immature and mature forms ^[12]. Broad spectrum antibiotic used to check secondary bacterial infection in stressed animals. Vitamin B-Complex helps to carry electrical signals efficiently and maintained gastrointestinal motility (Patel *et al.*, 2018a and Patel *et al.*, 2018b) and ascorbic acid reduces oxidative stress and promotes collagen formation lead to enhance the condition of the gastrointestinal tract.

4. Conclusion

Gastrointestinal (GI) parasitism by *M. expansa* generally causes minor health problems in goats but it affects growth and productivity of susceptible animal which leads to economic losses of marginal farmers. The affected animal can be successfully treated with the combination of praziquantel and levamisole along with the supportive therapy as well as proper care and management.

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