



Short Communication

Verminous pneumonia in goats- A case study

Manjeet Kumar

Department of Animal Husbandry, Veterinary Hospital Thill, District Kangra,
Himachal Pradesh, India 176 055

*Corresponding author: e-mail: dr.manjeet.13@gmail.com

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Abstract

Pneumonia is one of the most important causes of morbidity and mortality in Sheep and Goat and has multifactorial etiology like bacterial, viral, fungal or parasitic origin. In the present investigation, a flock of 34 goats with the history of persistent cough, nasal discharge, weight loss and loss of appetite from last few days was presented. Based on history of owner, three animals had died within two days with such symptoms. Postmortem of a female goat was conducted wherein depressed consolidated areas and elevated emphysematous patches was revealed on the lungs while trachea was filled with numerous thread-like reddish brown worms. Sick animals treated with de-wormers (fenbendazole & ivermectin), antibiotic (oxytetracycline), anti-inflammatory (meloxicam), hematinic and other supportive medication were recovered after one week. Therefore, prevention and control of lungworm infections is very important to increase the potential of small ruminant production and to get the maximum benefits from sheep and goat husbandry.

Keywords: Goat, disease, parasitology, pneumonia

Livestock is an integral part of farming (contributing 27 % towards the agricultural GDP) and has enormous potential for increasing the agricultural growth as well as farmers' income (Pathania and Sharma 2016; Sarial 2016). Goat husbandry plays a leading role in the livelihood of small and marginal farming community. In India about 27.80% of the total livestock is contributed by goats. Total goat population in India is 148.88 million as per 20th Livestock census and it has increased by 10.14% over previous five years period as per the Department of Animal Husbandry and Dairying (2019). Among pathological conditions, diarrhea and pneumonia are most common causes of mortality in small ruminants, which constitute 35.71% and 28.57%, respectively (Dohare *et al.* 2013). Lungworm infection, also known as verminous bronchitis or verminous pneumonia, is an inflammatory disease of the lower respiratory tract is caused by a variety of nematodes. Lungworms are important parasitic nematodes of small ruminants that colonize the lower respiratory tract and cause high morbidity and economic loss throughout the world (Asmareet *et al.* 2018). Small

ruminants can be infected by several lungworms but the most important species that can cause respiratory diseases are *Dictyocaulus filaria*, *Muellerius capillaris* and *Protostrongylus rufescen* (Panuska 2006). However, the pathogenic effects of these parasites depend on their location within the respiratory tract, the number of infective larvae ingested and the immune system of the animals. Clinical signs usually consist of a chronic fever, cough, thick nasal discharge, increased respiratory rate, poor appetite, and weight loss (Anmaw *et al.* 2015). Goats appear to be more susceptible to helminths than sheep as they appear to develop less immunity. Diagnosis can be done by taking history and clinical signs, presence of larvae in the fecal sample and postmortem examination. In Himachal Pradesh, a few outbreaks studies have been conducted on the verminous pneumonia in migratory sheep and goats (Asrani *et al.* 1999; Asrani *et al.* 2011).

A flock of 34 goats was presented with the history of persistent cough, nasal discharge, weight loss and loss of appetite. As per the history of owner a total of three animals have died with similar symptoms. On clinical examination pyrexia (103.5-104 °F), persistent cough

and respiratory distress, nasal discharge (Figure 1 A), slightly increased respiratory rates, reduced milk yields, and weight loss were seen and was in accordance with the Asrani *et al.* (1999) and Chakraborty *et al.* (2014). In most of the animals the conjunctival mucous membranes were pale indicating anemia. Postmortem of a female goat died with similar symptoms was conducted, depressed consolidated areas and elevated emphysematous patches was revealed on the lungs and trachea (Figure 1 B) which

were filled with the numerous thread-like reddish brown worms (Figure 1C) and these findings were similar to the previous studies of Asrani *et al.* 2011 and Mishra *et al.* 2018. Asrani *et al.* (2011) reported a mild pericarditis, hydrothorax, hydropericardium and catarrhal enteritis in sheep and goats infected with lungs worms. They also isolated *Escherichia coli*, *Corynebacterium spp.*, *Pasteurella haemolytica*, *Pasteurella multocida* and *Streptococcus pyogenes* from verminous lungs which indicated secondary complications.



Fig. 1 (A) Pale mucous membranes and nasal discharge in affected goats; (B) Pneumonic lesions in the lungs; (C) Heavy infestation of lung worms in trachea of goat

Most outbreaks of verminous pneumonia occur during cool season's especially autumn and early winter, because the larval stages of the causative worms tolerate and prefer low temperature (Bekele and Desta 2020). The diagnosis of pneumonia involves clinical examination, imaging, serology and identification of the etiological agent from nasal swabs, bronchial lavages, and even faeces (for verminous pneumonia) (Caswell and Williams 2007). Diagnosis can be based on the clinical signs and grazing history and confirmed by detecting the L1 stage in faecal samples using the Baermann technique (Adem and Jimma 2016). Based on clinical signs and postmortem findings the case was diagnosed as verminous pneumonia.

Treatment in the present investigation includes deworming with Fenbendazole @ 10mg /kg body weight (Tab Fentas plus) (Oakley 1980) and Ivermectin @ 0.2 mg/kg body weight (Tab Neomec) (Rehbein and Visser 2002). Treatment with inj oxytetracyclin (Vetocycline) @ 10mg/kg body weight × 3 days, Inj meloxicam with paracetamol (Melonex plus) 0.3 mg/kg body weight × 3 days inj pheniramine maleate (Avilin) 2 ml im, inj Tribivet 2ml i/m AD × 3 inj, Tablet Vets CoCu 1 tablet daiy for 15 days, was given.

The parasitic infestation in small ruminant's results in reduced productivity due to reduce weight gain,

poor feed utilization, loss due to mortality and treatment cost. Control of these parasites is therefore, essential for maximizing the potentials of small ruminants. It is suggested that the flock should be routinely treated with a suitable anthelmintic especially in late pregnancy. Flock must be removed from infected ground, placed on dry pastures and supplied with clean drinking water. Draining and resting of pasture during dry summer kill many larvae that readily survive cold winter (Upadhayay 2005). The faeces of infected flock should not be used for fertilizing lands on which crops for green feeding are grown (Bekele and Desta 2020).

Conclusion

Post mortem examination of dead animal is very much important along with other diagnostics test for confirmation of disease and making future strategies for its control. However, the majority of goat farmers are reluctant to conduct a necropsy on diseased animal for diagnosis due to lack of awareness. This results in under reporting of prevalent diseases. In general, farmer awareness, grazing management and timely deworming with anthelmintic are the most effective ways to control lungworm infestation.

Conflict of interest: Authors declare no competing interest.

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