

OUTBREAK OF MIXED PARASITIC INFECTION IN A MIGRATORY FLOCK OF GADDI SHEEP AND GOATS

R. K. ASRANI^{1*}, S. MITTRA², R. S. KISHTWARIA³, R. K. AGNIHOTRI², V. K. GUPTA¹
and MANDEEP SHARMA⁴

¹Department of Veterinary Pathology, ²Department of Veterinary Parasitology, ³Livestock Farm

⁴Department of Veterinary Microbiology, Dr. G. C. Negi College of Veterinary and Animal Sciences
CSK Himachal Pradesh Agricultural University, Palampur-176 062

SUMMARY

An outbreak of mixed parasitic infection in a migratory sheep and goat flock was investigated. *Teladorsagia (Ostertagia) circumcincta*, *Gaigeria pachyscelis*, *Trichuris ovis*, *Eimeria arloingi*, other strongyles and lung worms were found to be associated with this outbreak with heavy mortality up to 20%. The necropsy examination also revealed numerous hydatid cysts in the lungs of goat while a solitary large hydatid cyst was detected in the liver of sheep. *Streptococcus* spp. and *Staphylococcus aureus* were also isolated from the lung lesions and nasal tract of ailing animals. The histopathological alterations in the intestines and lungs attested the mixed severe parasitic and secondary bacterial infection.

Key words: Mixed parasitic infection, sheep and goats, *Streptococcus* spp, *Staphylococcus* spp

Helminthic infections are a major setback to profitable livestock production in Western Himalayas and other hilly regions of India (Asrani *et al.*, 1999, Yadav *et al.*, 2006). Sheep and goat rearing is generally the sole stay of livelihood for nomadic Gaddis tribe in the state of Himachal Pradesh. This communication places on record an unusual outbreak of mixed parasitic infection during the rainy season at an altitude of about 8000 ft above mean sea level that inflicted losses in a migratory flock of sheep and goats in Himachal Pradesh.

A mortality rate to the tune of 20% (40 goats and 20 sheep) was reported in a flock (susceptible population of 300 animals with nearly equal number of sheep and goats) within a period of 20 days. The clinical examination of the affected flock revealed high rectal temperature up to 107°F, muco-purulent nasal discharge coupled with respiratory rales and occasional bouts of severe coughing in a large number of animals mainly the adults. Nearly 5% of the animals discerned a frightened facial expression, as they were weak and dehydrated with shrunken eyes. Profuse diarrhoea was observed in most of the clinically sick animals due to which the

hindquarters were badly soiled with liquid offensive smelling intestinal contents. Some of the animals were seen passing out mucus after repeated rectal tenesmus. The rectal contents from 10 clinically sick animals (5 adult sheep and 5 adult goats) were collected separately in polythene bags for parasitological examination. Two moribund adult animals, one sheep and one goat, were sacrificed for gross and histopathological studies (Luna, 1968).

Hydropericardium and patchy grayish areas of consolidation on the dorsocaudal portion of the lungs were the prominent gross lesions in both the sacrificed animals. Numerous hydatid cysts measuring about 2 to 3.5 cm were seen embedded within the lung parenchyma of goat and on the right lobe of the liver in sheep. The abomasum and intestines were examined all throughout their length for the presence of parasites and lesions. The pyloric end of abomasum, in both sheep and goat revealed multiple tiny raised oedematous areas accompanied with petechiae at many places. A large number of worms recovered from this area were identified as *Teladorsagia (Ostertagia) circumcincta*. The duodenum, anterior jejunum and ileum revealed the presence of hookworms identified as *Gaigeria*

*Corresponding author: asranirk@gmail.com

pachyscelis (Fig. 1). The mucosa of intestine at these locations was found swollen, congested and covered by a thick viscid layer of mucus. The wall of caecum appeared markedly thickened due to oedema. The caecal contents showed massive worm load identified as *Trichuris ovis*. The rectal contents collected from ailing animals also confirmed the presence of strongyles ova (egg per gram faeces; epg range 12000-14000), *Trichuris* ova (epg 800-1000) and oocysts of coccidia (30000 and 40000 per gram) using McMaster egg counting technique (Soulsby, 1982). The coccidial species was identified as *Eimeria arloingi*. Examination of nasal froth/discharge did not reveal any evidence of either worm or parasitic larvae and ova.

The microscopic lesions were characterized by acute catarrhal enteritis with sloughing of its mucosa at places. Worms were seen embedded within the mucosal surface at many places. Besides, infiltration with lymphocytes and occasional eosinophils, numerous coccidial schizonts were evident in the mucosa attached to villous epithelium (Fig. 2). A plenty of sloughed necrotic debris in the lumen of intestine was accompanied with numerous coccidial oocysts. The microscopic picture in the lungs was characteristic of verminous bronchopneumonia accompanied with purulent exudate in the bronchioles and alveoli. Adult worms were seen in the lumen of bronchioles along with parasitic larvae and eggs.

The swabs of nasal discharge were aseptically taken from 10 clinically sick animals (5 sheep and 5 goats) for microbiological studies. The lung tissues from both the sacrificed animals were also collected aseptically. Both lung specimens and nasal swabs were inoculated on 6% sheep blood agar (BA) in duplicate. One set of BA plates was incubated microaerophilically and other set aerobically at 37°C for 48 hours for bacterial growth followed by biochemical tests for confirmation as described by Carter and Cole (1990). Microbiological processing of lung tissues collected from both the necropsied animals yielded pure colonies of *Streptococcus pneumoniae* and *Streptococcus pyogenes*. Nasal swabs from affected animals yielded *Streptococcus pyogenes* (three sheep and goats each) and *Staphylococcus aureus* (one sheep and three

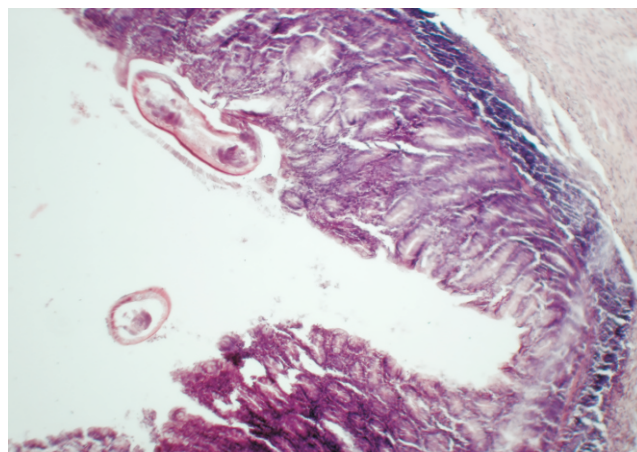


Fig 1. Cross and longitudinal sections of worms seen embedded within the intestinal mucosa of a goat. (H. & E. x 66)

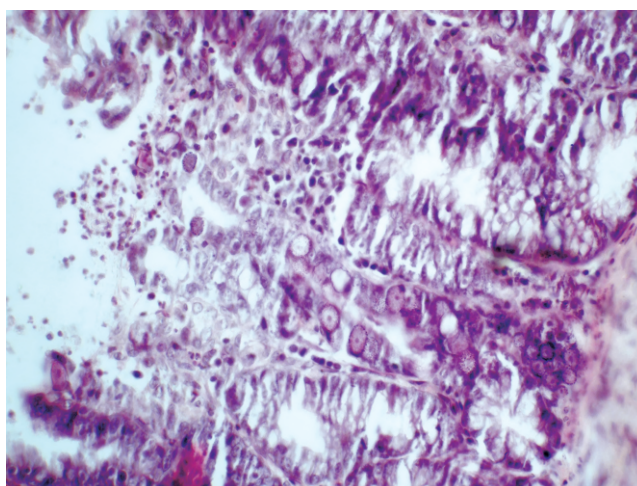


Fig 2. Intense parasitization of intestinal villous epithelium of goat by coccidial schizonts. (H. & E. x 132)

goats).

Majority of parasites involved in this outbreak have been posing a serious threat to sheep and goat production in the country (Jain, 1993; Saha *et al.*, 1996; Sharma *et al.*, 1997). On examination of gastrointestinal tracts of 240 goats, Saha *et al.* (1996) recorded 14.17% prevalence of *G. pachyscelis* while Sharma *et al.* (1997) reported 8 species of *Eimeria* in a flock of Pashmina goats where prevalence of *E. arloingi* was confirmed to the tune of 73%. In a survey on the prevalence of gastrointestinal and respiratory tract parasites in goats by Waruiru *et al.* (1994), 59% of the adults and 67% of the kids were shedding strongyle eggs; 20% of the kids were

infested with *T. ovis*; 77% of the adults and 64% of the kids had coccidia while 55% of the adult goats were harbouring lung worms. Surprisingly, mortality in the present outbreak was noticed mainly in the adult animals and it was more in goats than in sheep. Purulent lesions noticed in the lungs were attributed to the secondary infections due to *Streptococcus* spp. and *S. aureus*.

Hence there is a need for strict management practices particularly during the rainy season to avert losses. There is also a need to educate the farmers regarding the use of anthelmintics in appropriate doses on regular basis for proper deworming of sheep and goats. There is a need for regular deworming of their companion dogs to avoid contamination of pastures with their faeces containing echinococcal eggs so that the parasitic load in a flock can be minimized. Presence of hydatid cysts in the goats may be linked to the grazing behavior of these animal species especially in the hilly areas where presence of slopes makes it convenient for their grazing on plants, grasses, herbs or shrubs from a height simultaneously accessible to the dogs or other wild animals possibly provide favourable conditions for the completion of life cycle of echinococcosis in goats.

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