

Case Report

Clinical management of parasitic gastroenteritis (PGE) concurrent with moderate pneumonia in a goat: a clinical veterinary case report

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ABSTRACT

Objective: Gastro-enteritis is a parasitic disease caused by the nematode species which is considered as an important parasite in Malaysia. This case report described the management of Parasitic Gastro-enteritis concurrent with pneumonia in goat.

Materials and methods: The Jamnapari cross goat aged two years and weighing 40 Kg was presented to the Universiti Veterinary Hospital, Universiti Putra Malaysia with the history of diarrhea and depression. The goat was examined physically. Blood and fecal samples were collected for complete blood count, serum biochemistry analysis and parasitological examination. Standard treatment plan was applied for the correction of the the problem.

Results: Physical examination findings revealed the goat was in poor body condition, dull and depressed. Wet and dry fecal traces were observed around the groin region. The temperature was slightly elevated (39.5°C), the heart rate was increased (160 b/min) while other parameters were within normal range. Upon auscultation of the thoracic region, moderate crackle lung sound was determined. Visual observation of the nasal cavity indicated a bilateral mucopurulent nasal discharge. The hemogram result revealed evidence of a normocytic normochromic anemia, leukocytosis, neutrophilia with left shift and monocytosis. Serum biochemistry revealed increases in gamma-glutamyl transferase (GGT), sodium, chloride, creatine kinase (CK), and hyperglobulinemia. Fecal examination revealed increased in Strongyle egg count of about 2,700 eggs per gram of feces using the Modified McMaster technique. From the history, physical examination and laboratory findings the goat was diagnosed with clinical parasitic gastroenteritis (PGE) concurrent with moderate pneumonia infection. The therapeutic plan for this case were 45 mL of kaolin-pectin (30 mL/Kg body weight) orally SID for 3 days as anti-diarrhea, 12 mL Levamisole (12 mg/Kg bwt) was administered orally once as anthelmintic, fluid therapy was instituted using 1.5 L of Lactated Ringers' solution once via intravenously. Trimethoprim-Sulfamethoxazole (1 mL/16 Kg bwt) was administered intramuscularly SID for 3 days.

Conclusion: Follow up examination of the goat a week post treatment indicated a good prognosis as the nasal discharges were cleared, diarrhea stopped and the goat was active.

KEYWORDS

Goat; Moderate pneumonia; PGE; Veterinary medicine

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INTRODUCTION

Gastro-enteritis is a disease condition that can be caused by parasites, bacteria or even virus ([Zainalabidin et al., 2015](#)). Parasites of the nematode species, mostly the strongyles are associated with this condition. These include; *Heamonchus*, *Trichostrongylus*, *Oesophagostomum*, *Cooperia*, and *Strongyloides*. The major nematodes that infest goats in Malaysia, causing severe morbidity and mortality annually are the Strongyles ([Nor-Azlina et al., 2011](#)). The clinical signs of parasitic gastroenteritis are characterized by diarrhoea, loss of body weight, anaemia, lethargy, tachypnea, tachycardia and collapse ([Eysker and Hassan, 2005](#)). The infestation of livestock with parasites causes a serious socio-economic downturn in livestock production ([Hambali et al., 2016](#)). This effect has a devastating reflection on the current agricultural and financial gains as it relates to the farm profitability for both subsistence and commercial agriculture. The federation of livestock farmer's association in Malaysia reported that the population of goat and sheep were estimated to be between 545,000 and 134,00, therefore in order to increase mutton production to meet up the teaming population in Malaysia, control of parasitic infestation in these ruminants is a crucial task ([Zainalabidin et al., 2015](#)).

The infection of ruminants with strongyles is usually by ingestion of the L3 larvae during feeding ([Roeber et al., 2013](#)). The control of parasitic nematodes in livestock is usually via the use of anthelmintic drugs, though over the years reports have clearly indicated that the price and the quality of anthelmintic drugs coupled with the development of resistance by nematodes have impeded positive results after treatment ([Sutherland and Leathwick, 2011](#)). Although, a trial vaccine (Barbervax) against *H. contortus* in small ruminants have been exploited by the Moredun Research Institute in the United Kingdom, it is currently licensed for use in Australia ([Kearney et al., 2016](#)). The occurrence of parasitic gastroenteritis in many cases have been associated with the age of animals as younger animals are more susceptible, environmental factors favoring larval survival and growth, peri-parturient rise (PPR) during pregnancy, genetic influences and the nature of farm management ([Roeber et al., 2013](#)).

Pneumonia is the inflammation of pulmonary parenchyma and it is one of the most common respiratory health problems in small ruminants globally ([Sutherland and Leathwick, 2011](#)). This condition is caused by both infectious and non-infectious agents ([Rano et al., 2001](#)). The most common infectious form of Pneumonia in goats is caused by *Pasteurella multocida* or

Mannheimia haemolytica, both of which are found around the upper respiratory tract ([Shafarin et al., 2007](#)). This condition can lead to decreased performance in goats and the occurrence is associated with poor management practices, secondary infection, stress, overcrowded pens, poor ventilation, environmental and climatic changes ([Yener et al., 2009](#)). The clinical signs of pneumonia include rise in body temperature (40-41°C), painful moist cough, dyspnoea, anorexia and depression ([Caswell and Archambault, 2007](#)). Diagnosis is based on clinical signs and pen history, physical examination via auscultation and grading the severity of pneumonia, bacterial isolation from the tracheal wash or from necropsy samples of lung tissue ([Shahriar et al., 2002](#)). Treatment of pneumonia is achieved using penicillin, ampicillin, tetracycline, Oxytetracycline, tylosin and florfenicol ([AliAbadi and Lees, 2000](#)). Vaccination have been a method of preventing pneumonia in goats and it is practiced in Malaysia ([Abdullah et al., 2015](#)). This clinical veterinary case report describes the clinical management of parasitic gastroenteritis (PGE) concurrent with moderate pneumonia infection in a goat.

Case history: A Jamnapari crossed goat aged two years old weighing about 40 Kg was presented to the University Veterinary Hospital, Universiti Putra Malaysia with a history of diarrhea for about a week. The goat was managed in a semi-intensive management system.

Clinical examination: Physical examination findings revealed the goat was in poor body condition, dull and depressed. Wet and dry fecal traces were observed around the groin region. The temperature was slightly elevated (39.5°C), the heart rate was increased (160 b/min) while other parameters were within normal range. Upon auscultation of the thoracic region, moderate crackle lung sound was determined. Visual observation of the nasal cavity indicated a bilateral mucopurulent nasal discharge.

Diagnostic work-ups and Treatment: Blood and fecal samples were collected for complete blood count, serum biochemistry analysis and parasitological examination. The hemogram result revealed evidence of a normocytic normochromic anaemia, leukocytosis, neutrophilia with left shift and monocytosis. Serum biochemistry revealed increases in gamma-glutamyl transferase (GGT), sodium, chloride, creatine kinase (CK), and hyperglobulinemia. Fecal examination revealed increased in Strongyle egg count of about 2,700 eggs per gram of feces using the Modified McMaster technique. From the history, physical examination and laboratory findings the goat was diagnosed as clinical parasitic gastroenteritis (PGE) with moderate pneumonia infection.

The therapeutic plan for this case were 45 mL of kaolin-pectin (30 mL/Kg) was instituted via orally SID for 3 days as anti-diarrhea, 12 mL Levamisole (12 mg/Kg) was administered orally once as anthelmintic, fluid therapy was instituted using 1.5 L of Lactated Ringers' solution once via intravenously. Trimethoprim-Sulfamethoxazole (1 mL/16 Kg) was administered intramuscularly SID for 3 days. Follow up examination of the goat a week post treatment indicated a good prognosis as the nasal discharges were cleared, diarrhea stopped and the goat was active.

DISCUSSION

Based on the clinical observations and laboratory findings, this is a clinical case of parasitic gastroenteritis (PGE) concurrent with moderate pneumonia infection. The diarrhea and anemia condition in this case is due to parasitic gastroenteritis (PGE) condition and is in agreement with the study carried out in Georgia 2017 where animals infected with parasitic gastroenteritis exhibit similar clinical signs as in this case ([Mbaya et al., 2009](#)). Clinical signs of mucopurulent nasal discharge coupled with the crackle lung sound is an indication of pulmonary parenchymal inflammation ([Elsheikh and Hassan, 2012](#)). The combined effect of these conditions will lead to the social withdrawal of the animal, depression and pyrexia and all these symptoms were observed in this case. The parasitic gastroenteritis often results in mucosal epithelial disruption with the seepage of plasma into the lumen resulting in hypoproteinemia and immunosuppression ([Evering and Weiss, 2006](#)). The episode of immunosuppression might have actually facilitated bacterial proliferation in the respiratory tract which eventually led to the onset of pneumonia. In this case, the possible cause of parasitic gastroenteritis (PGE) may be due to irregular deworming schedule as stated by the farmer and this may lead to under dosing the animal with anthelmintics. Studies by [Leathwick and Besier \(2014\)](#) stated that under dosage treatment with anthelmintic is a potential source of drug resistance in small ruminants therefore, this might have aggravated the parasitic gastroenteritis despite the claims of regular deworming in this case.

Selective administration of drugs in treating clinical signs have been suggested to be beneficial ([Carbaret, 2010](#)). Treatment was instituted using kaolin-pectin in this case as anti-diarrhea because of its adsorbent and protective property where it absorbs excess fluid and reduces intestinal movement and this is in accord with the choice of treatment in the case reported by [Abdullah et al. \(2016\)](#) where the same drug was given to solidify the loose faeces in an attempt to halt diarrhea. Levamisole

was administered in this case as anthelmintic due to its efficacy in anthelemintic activity where it paralysis the parasite and this drug was recommended by ([Zajac and Gipson, 2000](#)) and was effective in treating PGE in this case. In order to rehydrate the dehydrated patient due to excessive diarrhea and fluid loss, fluid therapy is crucial and this choice of treatment was adapted in this case and was in accord with treatment plan in managing a similar case of dehydration by [Abdullah et al. \(2016\)](#) where dehydration in a diarrheic goat was corrected using the same regimen. Trimethoprim-Sulfamethoxazole is a potentiated antibiotic and used as one of the treatment of choice for moderate and severe bacterial pneumonia cases in small ruminants ([Abdullah et al., 2015](#)) and was used in this case and gave a good outcome.

CONCLUSION

This clinical veterinary case report highlights the clinical management of parasitic gastroenteritis (PGE) concurrent with moderate pneumonia infection in a goat. Early diagnosis of the case and correct combination of therapeutic plan may help in giving out positive outcomes and good prognosis as observed in this case. Proper and strict deworming program and vaccination against pneumonia should be recommended in this farm for the herd health program (HHP) to avoid recurrence of the similar case in the farm.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHORS' CONTRIBUTION

FFAJ, UHI, SMA and MTGF conceived the clinical case and performed the treatment and clinical care of the case. FFAJ, UHI and YA wrote and edited the manuscript. All authors were involved in revising the manuscript and approved the final manuscript

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