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PREVALENCE OF COCCIDIOSIS IN DOGS ALONG WITH HAEMATOLOGICAL ALTERATIONS AS A RESULT OF CHEMOTHERAPEUTIC TRIAL

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ABSTRACT

A case control study was conducted on 200 dogs to ascertain the prevalence of coccidiosis (Isosporiosis). A chemotherapeutic trial was also conducted to compare the efficacy of Co-trimoxazole and Furazolidone along with the effect of Isosporiosis and medication on various haematological parameters. The prevalence of Isospriosis was 18%. In chemotherapeutic trial, 30 naturally infected dogs were randomly divided into three equal groups A, B and C. Group A was treated with Co-trimoxazole (15 mg/kg) orally, Group B with Furazolidone (8 mg/kg) orally, while Group C was kept as infected non-medicated control. Group D consisting of 10 non infected dogs was kept as non infected non medicated control. The efficacies of these chemotherapeutic agents were evaluated by counting oocysts per gram (OPG) of faeces on day 0, 3, 7 and 10 post medication. The results revealed that Co-trimoxazloe and Furazolidone had 97 and 95% efficacy, respectively. As a result of treatment in groups A and B, the values of haemoglobin and packed cell volume significantly increased on day 3, 7 and 10 post-medication. It was concluded that Co-trimoxazole and Furazolidone both were effective against coccidiosis in dogs but Co-trimoxazole was better than Furazolidone.

Keyword: Prevalence, coccidiosis, chemotherapy, dogs.

INTRODUCTION

Canine intestinal coccidiosis is a cause of haemorrhagic diarrhea in young immunocompromised dogs (Mitchell *et al.,* 2007). In coccidiosis, microscopic parasites invade the intestinal mucosal lining, causing watery diarrhea which later becomes bloody and can even be life threatening. Anorexia, vomiting, mental depression and ultimately death may be seen in severely affected animals. Dogs may be infected with *Isospora hammondia*, *Sarcocystis*, *Cryptosporidium* and *Toxoplasma* forms of coccidia. The most common coccidia of dogs are isospora.

To overcome the economic losses, proper diagnosis and treatment of coccidiosis is very important. The present study was undertaken to determine the magnitude of coccidiosis (Isospora species) in dogs alongwith chemotherapeutic trial using Co-trimoxazole and Furazolidone against coccidiosis and their effects on various blood parameters.

MATERIALS AND METHODS

Collection and processing of samples

Two hundred dogs of mix breeds brought to the Pet Centre, University of Veterinary and Animal Sciences, Lahore, Pakistan, for the treatment of various ailments were included in the study. Faecal sample from each dog was collected directly from rectum in a small polythene bag and was examined for the presence of oocysts by direct smear method, fecal flotation and sedimentation techniques (Soulsby, 1982). Oocysts per gram were calculated by modified Mc-Master technique (Urquhart *et al*., 1996). Blood samples with EDTA were collected directly from the cephalic vein of dogs included in the therapeutic trial for haematological parameters (Benjamin, 1978).

Chemotherapeutic trial

Thirty dogs with positive faecal sample for coccidiosis were randomly divided into three equal groups i.e., A, B and C. The dogs in group A were treated with Co-trimoxazole (15 mg/kg bwt) orally. The dogs in group B were given Furazolidone (8 mg/kg bwt) orally. The dogs in group C were kept as untreated positive control. Another group D with 10 animals was kept as control negative with negative faecal sample for coccidiosis.

The efficacy of Co-trimoxazole and Furazolidone against coccidiosis was determined by faecal examination for oocysts. The faecal samples were examined for the presence of coccidial oocysts before treatment and at 0, 3, 7 and 10 days post medication. The percent efficacy was determined for both chemotherapeutic agents by counting coccidial oocyst per gram of faeces (OPG) as per following formula:

Percentage efficacy = $\frac{\text{Reduction of oocyst per gram}}{\text{OPG before medication}} \times 100$

The blood parameters including haemoglobin concentration (Hb) and packed cell volume (PCV) were determined by Sahlis method (Coles, 1986) and microhematocrit method (Benjamin, 1978), respectively on zero, 3, 7 and 10 day post medication.

Statistical analysis

Data thus obtained were subjected to one way analysis of variance (Steel and Torrie, 1982) and Tukeys pair wise comparison test (Gerry and Keough, 2002) were used for multiple mean comparisons.

RESULTS AND DISCUSSION

On the basis of faecal examination, the prevalence of coccidiosis (Isosporiosis) in dogs included in the study was 18%. The results are in close agreement with those of Anene *et al.* (1996), who reported the prevalence of Isosporiasis in dogs as 18.3%.

The prevalence in the present study was quite high compared to the findings of Buehl *et al.* (2006), who reported 8.7% prevalence of coccidiosis in dogs. This could be attributed to irregular use of anti-coccidal drugs, breeds, geographic conditions and awareness of the owners about the disease. However, Penzhorn *et al.* (1992) reported prevalence of coccidiosis as 26% in German shepherd bitches and 51.7% in their litters.

Chemotherapy

The marked decrease in OPG was observed as a result of medication with both therapeutic agents. The mean pretreatment OPG of group A was 1,110 that decreased to 64, 90 and 97% on 3rd, 7th and 10th day after administration of Co-trimoxazole. The mean pretreatment OPG of group B was 1,145 that decreased to 63, 89.8 and 95% on 3rd, 7th and 10th day after administration of Furazolidone. However, in untreated group C the mean OPG at the start of the trial was 1,005 that increased up to 30, 34.33 and 61.19% at 3rd, 7th and 10th day of trial (Table 1). The mean OPG of faeces of group D were found to be zero throughout the study because this group was non infective and non medicated (negative healthy control).

Statistically, there was non significant difference in OPG in groups A, B and C but these three groups had significantly higher OPG compared with group D before medication. After medication, groups A and B had lower OPG ($P<0.05$) compared with untreated control group C on day 3, 7 and 10 post treatment. Based on criteria of percentage reduction in the number of oocysts in faeces, it was observed that Co-trimoxazole was more effective (97%) compared to Furazolidone (95%) against coccidiosis (Isospora species) in dogs.

Haematological studies

The mean values of haemoglobin concentration (Hb) and packed cell volume (PCV) of groups A, B and C were lower than those for group D on day zero ($P<0.05$). After medication, the Hb concentration and PCV in groups A and B increased to the values of control negative, statistical analysis revealed non significant difference on 10th day of medication between groups A, B and D; the difference was significant ($P<0.05$) when compared with group C (Tables 2 and 3). Hayat *et al.* (1990) and Mehmood *et al.* (2001) also reported a decrease in haemoglobin concentration and packed cell volume in animals affected with coccidiosis. The findings of the present study revealed that blood loss as a result of haemorrhagic enteritis due to Isosporiosis may be one of the inciting causes of anemia in affected dogs and may be helpful in preclinical diagnosis of Isosporiosis and other related coccidial infections.

Conclusions

It was concluded from the results that both therapeutic agents are effective against coccidiosis in dogs. However, Co-trimoxazole gives better results than Furazolidone.

Table 1: Faecal oocyst count on zero, 3rd, 7th and 10th day post medication

Groups	Chemotherapeutic agents	Zero day	3rd day	7th day	10th day
A	Co-trimoxazole	$1110.0^{a} \pm 308.9$	$395.0^{a} \pm 106.6$	$110^{a} \pm 69.9$	$30.0^{a} \pm 48.3$
B	Furazolidone	$1145.0^{a} \pm 428.5$	$425^{a} \pm 120.8$	$115^{a} \pm 53.0$	$60.0^{a} \pm 65.8$
C	Control (positive)	$1005^{a} \pm 461.5$	$1305.0^{b} \pm 215.3$	$1350^{b} \pm 380.1$	$1620.0^{b} \pm 255.2$
D	Control (negative)	$0^{b} \pm 0.0$	$0^{c} \pm 0.0$	$0^{c} \pm 0.0$	$0^{c} \pm 0.0$

The means having different superscripts in the same column are significantly different ($P<0.05$).

Table 2: Mean value of haemoglobin in dogs of group A, B, C and D on zero, 3rd, 7th and 10th day

Groups	Chemotherapeutic agent	Days post medication			
		Zero	3rd	7th	10th
A	Co-trimoxazole	$9.63^{a} \pm 1.23$	$9.78^{a} \pm 0.96$	$11.78^{a} \pm 1.16$	$13.64^{a} \pm 0.83$
B	Furazolidone	$9.51^{a} \pm 1.07$	$9.62^{a} \pm 1.30$	$11.13^{a} \pm 1.34$	$12.68^{a} \pm 0.97$
C	Control (positive)	$9.74^{a} \pm 1.20$	$8.56^{b} \pm 0.63$	$8.27^{b} \pm 0.66$	$8.09^{b} \pm 0.60$
D	Control (negative)	$13.91^{b} \pm 0.06$	$14.30^{c} \pm 0.57$	$14.09^{c} \pm 0.53$	$14.2^{a} \pm 0.47$

The mean having different superscripts in the same column are significantly different ($P<0.05$).

Table 3: Mean value of packed cell volume in dogs of different groups on zero, 3rd, 7th and 10th day

Groups	Chemotherapeutic agent	Day post medication			
		Zero	3rd	7th	10th
A	Co-trimoxazole	$31.05^{a} \pm 2.95$	$33.40^{a} \pm 1.87$	$39.69^{a} \pm 1.80$	$44.52^{a} \pm 3.36$
B	Furazolidone	$30.05^{a} \pm 2.01$	$33.00^{a} \pm 1.84$	$37.72^{a} \pm 2.7$	$44.44^{a} \pm 2.57$
C	Control (positive)	$29.73^{a} \pm 2.01$	$29.50^{b} \pm 1.95$	$28.90^{b} \pm 1.95$	$28.73^{b} \pm 1.62$
D	Control (negative)	$43.18^{b} \pm 1.14$	$43.23^{c} \pm 1.65$	$43.27^{c} \pm 1.13$	$43.77^{a} \pm 1.53$

The mean having different superscripts in the same column are significantly different ($P<0.05$).

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