



HAEMATOBIOCHEMICAL CHANGES IN BOVINE COCCIDIOSIS*

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Coccidiosis is an important protozoan disease of cattle causing profound economic loss. Disease outbreaks generally occur in calves less than a year old, but may also occur in older cattle that can act as carriers (Agnihotri, 1993). In Kerala, the most commonly encountered species resulting in bovine coccidiosis were known to be *Eimeria ellipsoidalis*, *E. zuernii* and *E. bovis* and to a lesser extent *E. subsperica*, *E. wyomingensis*, *E. bareillyi*, *E. cylindrica* and *E. brasiliensis* (Sreevidya and Devada, 2002). Stress factors like overcrowding, changes in feed, severe weather and surgery act as predisposing agents. Patho-physiological changes associated with coccidial infections have been reported by Fitzgerald and Mansfield (1972), Stockdale *et al.* (1981) and Holst and Svensson (1995). This paper presents the clinical picture and haematological alterations in cattle infected with coccidia under natural conditions.

Cattle of different age groups, brought to the Veterinary Hospitals of the Kerala Agricultural University including Veterinary Ambulatory clinics and nearby localities formed the cases for the study. The intensity of infection was determined by coprological examination and oocyst counts. Blood was collected from 10 clinically infected adult animals in sterile vials as described by Benjamin (1998) for the estimation of parameters like Hb, PCV, TLC, DC and serum samples were subjected to the estimation of protein fractions. The results were statistically analysed with those obtained from ten apparently healthy adult animals (Snedecor and Cochran, 1985).

Floation technique using Sheather's sucrose solution was useful in maintaining the structural integrity of oocysts which helped in diagnosis. It was revealed by coprological examination that infection with a few oocysts

produced mild or no apparent sign. In cases where the number of oocysts per gram (OPG) of faeces ranged from 1000 to 8000, animals exhibited signs like diarrhoea, weakness and anorexia with occasional streaks of blood and mucus in the dung. In acute infections, wherein the OPG was found as high as 7,00,000, animals suffered from severe diarrhoea that was foul smelling and blood tinged along with rough hair coat, dehydration, emaciation, tenesmus and soiled hind quarters.

Haematological alterations were significant in the infected group as portrayed in Table 1. The marked reduction in the values of Hb (8.5 ± 1.66) and VPRC (28.64 ± 10.68) could be attributed to the haemorrhagic lesions in the intestine and subsequent blood loss (Stockdale *et al.*, 1981). A slight reduction in the TLC could be ascribed to the significant lymphopenia resulting from systemic stress in the aftermath of coccidiosis (Benjamin, 1998). Mild neutrophilia and a drastic monocytosis was also observed in infected animals which could be consequent to inflammatory conditions following protozoan infections as stated by Benjamin (1998).

A significant reduction in the level of total proteins (5.97 ± 1.77) in the serum of infected animal could be coincidental with the generalized injuries and blood loss (Table. 2). Reduced globulin values indicate insufficient immune response (Holst and Svensson, 1995).

Summary

A substantial reduction in the values of PCV and Hb was observed in cattle naturally infected with coccidia species, along with a mild neutrophilia and monocytosis. A conspicuous drop in serum protein fractions in consequence of blood loss and intestinal injury was also spotted in the affected animals when compared to healthy stock.

Table 1. Mean values of haematological parameters in coccidia infected cattle

| Parameter | Infected (10) | Control (10) | “t” values |
|---------------------|-------------------|------------------|------------|
| | Mean ± SE | Mean ± SE | |
| Hb(g/dl) | 8.5 ± 1.66 | 12.49 ± 2.34 | 3.38* |
| VPRC (%) | 25.4 ± 6.02 | 32.55 ± 4.91 | 2.47* |
| TLC(10^3 /cu.mm) | 10980.0 ± 2430.17 | 2265.0 ± 3857.33 | 0.95 NS |
| Neutrophil (%) | 36.6 ± 8.73 | 25.6 ± 6.92 | 2.67* |
| Lymphocyte (%) | 46.07 ± 13.13 | 66.4 ± 9.54 | 3.46* |
| Eosinophil(%) | 4.8 ± 8.53 | 5.8 ± 3.97 | 0.25 NS |
| Monocyte(%) | 13.0 ± 2.55 | 1.2 ± 1.47 | 11.50** |

Table 2. Mean values of serum protein fractions in coccidia infected cattle

| Fraction | Infected (10) | Control (10) | “t” values |
|------------------------|---------------|--------------|------------|
| | Mean ± SE | Mean ± SE | |
| Total protein (g/dl) | 5.97 ± 1.77 | 8.11 ± 2.16 | 2.42* |
| Albumin (g/dl) | 3.37 ± 1.59 | 3.26 ± 0.71 | 0.19* |
| Globulin(g/dl) | 2.96 ± 2.22 | 4.85 ± 2.13 | 1.94 NS |
| Albumin:globulin ratio | 1.85 ± 1.44 | 0.77 ± 0.08 | 2.34 * |

* Significant at 5% ($P \geq 0.05$), ** Significant at 1% ($P \leq 0.01$), NS- Non significant

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