The Indian Journal of Animal Reproduction; 27 (2): 91-93; Dec. 2006

Short Communication

Study of effect of anthelmintic treatment on metabolic profile of anestrus Haryana cows*

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Received : May 22, 2005
Accepted : November 6, 2006

ABSTRACT

Thirty four Haryana cows were selected (24-anestrus and 10-normal cyclic) from the university farm for the study of metabolic profile of anestrus cows in response to anthelmintic treatment. Faecal samples of these animals were examined for the presence of parasitic eggs. Haematobiochemical studies viz. haemoglobin (Hb), glucose and total protein were also conducted. An overall increase of Hb, serum glucose and total protein concentration in anthelmintic treated animals was greater than untreated group. This might be because of increased feed consumption by anthelmintic treated animals. The concentration of Hb was significantly higher ($P<0.01$) in cyclic cattle compared to anthelmintic treated and untreated anestrus animals. The concentration of glucose in cyclic animals was also higher compared to both, anthelmintic treated and untreated groups but the difference being non-significant. The total protein concentration in cyclic animals was lower significantly ($P<0.05$) compared to anthelmintic treated and non-significantly compared to anthelmintic untreated animals showing that the concentration of total protein is not related with the exhibition of estrus symptoms. Four (23.53%) animals came into estrus after treatment with fenbendazole whereas in untreated group, only one (14.29%) animal came into estrus. This shows that anthelmintic treatment is useful in relation to exhibition of estrus.

Key words: Anthelmintic, metabolic profile, Hb, glucose, total protein, infertility, cow.

Amongst the various factors that produce impaired fertility, anestrus assumes paramount importance causing great economic loss to the farmers. Amongst the various factors that cause anestrus, under nutrition is a major one (Parker and Blowey, 1976 and Bhaskaran and Patil, 1982). The nutritional status of the animals is influenced by gastrointestinal (G.I.) nematodes which cause reduced appetite, anemia, hypo-proteinemia, diarrhea and intestinal obstruction. Most of the G. I. parasites browse on mucosa, feed on ingesta and digested food or are blood suckers. Whatever the case may be, the intruders rob the host nutrients (Samanta *et al.*, 2000). Therefore, an attempt was made to find out a relationship between parasitic (anthelmintic) infestation and postpartum anestrus condition by employing metabolic profile.

Twenty four post-partum (> 90 days of calving), parous and lactating, Haryana cows aged between 4 to 10 years and having body weight between 170 to 305 kg, belonging to District Dairy Demonstration Farm, College of Veterinary Science, Mathura were employed for this study. Anestrous was confirmed on the basis of their history as well as per rectal examination of the genital organs twice at an interval of 10 days. Animals having smooth and inactive ovaries with apparently normal genitalia and with no palpable abnormalities were used for this study. The animals were maintained on wheat straw, greens and concentrate. They were also allowed for grazing. Faecal samples of these animals were subjected for microscopic examination of parasitic eggs and all the animals were found positive for bursate worms. These animals were divided into two groups; the first group consisting of 17 animals was treated with fenbendazole (Fentas, M/S Intas Pharmaceuticals Ltd.) @ 5 mg/ kg body weight orally while the second group of 7 animals was kept as

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untreated control. All the fenbendazole treated animals were examined on two occasions for parasitic eggs and were found negative. The blood samples were collected from treated and untreated (control) animals on the day of anthelmintic treatment (day 0) and on 10th and 20th days post treatment. The normal cyclic animals were selected from A. I. center of Veterinary College, Mathura and used for comparative study. The blood samples from cyclic cows (n=10) were taken once at the time of the A. I.

The concentration of Hb was estimated by using Hellige Sahli haemoglobinometer. The glucose was estimated by enzymatic GOD-POD method using kits supplied by Span Diagnostic Ltd. Estimation of total proteins was done by modified Biuret and Dumas method using kits supplied by above mentioned company. Statistical analysis was done as per Snedecor and Cochran (1971) utilizing't' test.

Considering the change in the concentration of Hb in treated group of animals from day 0 to day 20, it was revealed that there was a significant ($P<0.01$) increase (2.49 g/dl) between day 0 to day 10 while between day 10 to 20, a slight though non significant increase (0.31 g/dl) in the concentration was noticed. The overall (day 0 to 20) significant ($P<0.01$) rise (2.80 g/dl) in concentration of Hb were noticed. In untreated control group, a slight though non significant rise (0.72 g/dl) was noticed between day 0 to 10. A similar non significant rise (0.57 g/dl) in the concentration of Hb was noticed between day 10 to 20, however overall (day 0 to 20) significant ($P<0.05$) rise (1.29 g/dl) in concentration of Hb was observed. There was no significant difference observed between the overall mean concentration of Hb in treated and untreated animals. The mean concentration of Hb in cyclic animals differed significantly with the overall mean concentration of the anthelmintic treated ($P<0.01$) and untreated ($P<0.01$) animals. Reports suggest that animals having intestinal parasites (Soulsby, 1982) or infected with helminth parasites (Chaudheri *et al.*, 1988) have a reduced Hb concentration. However in our study, there was a significant increase in Hb concentration in both treated and untreated animals. This significant increase In Hb concentration in untreated group might be due to small sample size.

The rise in glucose concentration in treated animals between day 0 to 20 was 13.13 mg/dl whereas in their corresponding untreated control, the rise was only 3.57 mg/dl. This might be because of increased feed consumption by anthelmintic treated animals. The concentration of glucose in cyclic animals was higher compared to treated and untreated animals but the difference was non significant. Various workers had reported higher concentration of glucose in cyclic animals (Naidu and Rao, 1982; Arosh *et al.*, 1998 and Muthukumar *et al.*, 2004).

A gradual rise in concentration of total protein was observed between day 0 to 20 in anthelmintic treated animals while in untreated animals, there was an initial rise between day 0 to 10 followed by a decline between

Table 1. Comparative metabolic profile of anthelmintic treated and untreated anestrus animals and cyclic animals

Metabolic profile		Hb (g/dl)	Glucose (mg/dl)	Total protein (g/dl)
Anthelmintic Treated	Day 0	8.27 ± 0.28^{a}	45.69 ± 2.08^{d}	6.82 ± 0.29
	Day 10	10.76 ± 0.15^{b}	50.49 ± 2.08^{de}	7.14 ± 0.10
	Day 20	11.07 ± 0.23^{bc}	58.82 ± 6.04^{f}	7.30 ± 0.18
Untreated	Day 0	9.34 ± 0.51^{a}	46.43 ± 5.71	6.64 ± 0.20
	Day 10	10.06 ± 0.31^{ab}	46.43 ± 3.57	6.91 ± 0.18
	Day 20	10.63 ± 0.22^{b}	50.00 ± 7.71	6.85 ± 0.15
Overall	Untreated	10.04 ± 0.22^{a}	47.69 ± 3.16	6.80 ± 0.11^{cd}
	Treated	10.04 ± 0.22^{a}	51.67 ± 2.24	7.08 ± 0.09^{c}
	Cyclic	14.90 ± 0.20^{b}	58.33 ± 6.22	6.55 ± 0.21^{d}

day 10 to 20. The rise was more in treated animals compared to untreated animals (0.48 g/dl vs. 0.21g/dl).This finding also strengthened the fact of increased feed consumption of animals after anthelmintic treatment leading to increased serum protein concentration. This is further supported by Soulsby (1982) and Chaudhari *et al.* (1988) suggesting that the serum total protein level reduced significantly in the condition of gastrointestinal parasites and liver flukes. Similar views have been expressed by who found a significant reduction in total protein. Ali *et al.* (1991) also observed a significant increase the concentration of total protein in rural anestrus heifers by anthelmintic treatment.

Cyclic animals had a lower concentration of serum total protein than the treated or untreated anestrus animals. However, the effect was only significant with treated animals. Our results thus suggest that the concentration of total protein is not related with the exhibition of estrus symptoms as is also suggested by Patil and Deshpande (1979). Chandolia and Verma (1987) also reported a marginally higher total protein concentration in anestrus animals compared to estrus and diestrus animals while Samad *et al.* (1980) did not find any significant change in the concentration of total protein in anestrus and cyclic animals.

Four (23.53%) animals came into estrus after treatment with fenbendazole whereas in untreated group, only one (14.2 %) animal came into estrus. This shows that anthelmintic treatment is useful in relation to exhibition of estrus.

A metabolic profile seems to be inadequate in assessing the effect of anthelmintic treatment on the anestrus animals in relation to exhibition of estrus. Therefore, further detailed study involving sufficient number of animals is still required.

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