Haematological changes in naturally infested dairy animal at central zone of vidarbha

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Abstract

A total of 2288 faecal samples collected from dairy animal of central zone of vidarbha region (Maharashtra) from July 2002 to June 2003 revealed 62.98% prevalence of helminthic infection. *Paramphistomum sp.* were predominant (12.28%) fallowed by *Toxocara* (10.97%). The percentage prevalence of *monezia strongyloides , Haemonchrus, Fasciola Schistosoma, Trichuris, Oesophagostmum* and *Trichostongylus* species were 8.96%, 6.99%,5.98%,3.81%,1.87%,1.00%, 0.96% respectively. The overall prevalence of nematode, trematode, cestode and mixed type of helminth infection was 41.63, 11.11 0.98 and 46.28 percent respectively. The helminth infection was most common encountered during and after rainy seasons. The infected animals showed significant reduction in Hb, PCV,TLC,TEC, neutrophils while lymphocytes and monocytes count did not significant.

Keywords: Natural Infestation, Faecal, Dairy animal, Haematological changes.

Introduction

India is a predominantly agrarian country with more than 75% of its population living in villages, 80 % of which depending on agriculture and its allied actitivities for their livelihood. Rural dairying constitutes an integral and interwoven part of agriculture farming (Gupta 1997). The parasitic especially the helminthes infection result in great economic losses to livestock industry due to deterioration on health and reduced production of animal (Mahesh Kumar, 2002).

Material and Methods

The central zone of vidarbha region Maharashtra state lies to the east in between 77.18 to 79.40 east latitude and 19.26 to 21.44. North latitude with an area of 29783 sq. kms. The average temperature, humidity and annual rainfall ranges between 39ºC to 47.8ºC and 134 cm respectively. The climate was very suitable for the development and survival of parasitic infection.

A total 2288 dairy animal including cattle and buffalo of different breed, age and of both sexes were investigated from 25 villages during July 2002 to June 2003

Hematology of dairy animals heavily infected with gastrointestinal helminthes were carried out with standard technique before and after anthhelmintic drug treatment. Blood samples were collected from jugular vein with 18 gauge sterilized needle in sterilized vials containing 10 % EDTA as an anticoagulant, vials were sealed and labeled properly. At the same time blood smears were also prepared and fixed with methanol.

Results and Discussion

Out of 2288 faecal samples examined, 1441 were found positive for helminth infection (62.98%).

Table-1. The haematological values in dairy animal of central zone of vidarbha

Sr. No	Components	Healthy Animals (mean)	Infected Animals(mean)
1.	Hb (Hb gm/ 100ml)	12.21 ± 0.23	7.17 ± 0.27
2.	PCV (PCV %)	34.67 ± 0.62	22.89 ± 0.64
3.	TEC (10^6/cumm)	6.27 ±0.19	3.59 ± 0.10
4.	TLC (10^3/cumm)	7.38 ± 0.21	4.64 ± 0.11
5.	Lymphocyte	69.37 ± 1.07	73.11 ± 0.72
6.	Neutrophills	28.08 ± 0.25	16.60 ± 0.44
7.	Eosinophills	5.98 ± 0.38	7.55 ± 0.24
8.	Monocytes	2.57 ± 0.11	2.45 ± 0.11

The hematological finding revealed significant reduction in hemoglobin, packed cell volume, total erythrocyte count. The differential leukocyte count revealed significant decrease in neutrophills and increase in eosinophils , monocytes. The lymphocyte count not differ significantly in affected animals compared to the healthy animals. Lower Hb, TEC and marked leucocytosis is due to anaemia because of blood sucking ability of parasites and haemorrhage (Soulsby, 1982). There is significant increase in eosinophills and significant decrease in neutrophills in infected animals. The hematology of animals were studied and compared with the non infected animal by many workers in India and abroad.

The haematological values in this study concurs with those of chaudhary *et al.,*(1998) and Usharani Devi (2000), where they reported significant decrease in Hb, PCV,TEC,TLC, neutrophils and significant increase in eosinophills in affected animal with gastrointestinal helminthes. The observation on alternation in Hb. PCV and TEC proximated with the finding of Satish kumar *et al* (2001) reported the similar changes.

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World's first combination DNA vaccine for rabies developed

The Bangalore-based Indian Institute of Science (IISc) and Indian Immunologicals, Hyderabad have jointly developed the world's first combination vaccine containing DNA vaccine and a low of dose of cell culture vaccine. Animal toxicity tests of the vaccine are conducted at the National Institute of Nutrition, Hyderabad and the combination vaccine is expected to cost less than the existing ones in the market.

Prof. P N Rangarajan, associate professor, biochemistry department, IISc has worked on combination rabies vaccine (CRV) for the past five years. IISc has teamed up with Indian Immunologicals, which is now conducting various studies to scale up and undertake commercial production of the vaccine. It may take some time to launch the product in the market. Permission for clinical trials is yet to be obtained from Drugs Controller General of India. The department of biotechnology (DBT) is funding the current tests under Jai Vignan Vaccine Mission.

The latest rabies vaccine available in the market for veterinary and humans are cell culture vaccines, which is expensive to manufacture. But, in most government hospitals, the nerve tissue vaccine is used for rabies, which has been banned worldwide, informs Prof. Rangarajan.

The research programme of the CRV at IISc commenced with the development of a DNA rabies vaccine (DRV) by taking a gene from the rabies virus and introducing it into the multiplying bacteria. But a vaccine produced in this method, was only 50-70 per cent effective, though the cost of production was less than that of the cell culture vaccine. Working further on its potency, the IISc team of scientists found that addition of small quantity of the modern cell culture vaccine enhances the potency of DRV and this unique combination.

"What we aim to do is to bring the world's first vaccine containing DNA to the market," said Prof. Rangarajan. The principle works best on both human and veterinary vaccine and has shown positive results on mice and cattle. The IISc team has already filed an international patent under the PCT [Patent Cooperative Treaty] and its International Search Report has confirmed it as a unique vaccine, informed Prof. Rangarajan. "We now have to file for patents in all PCT countries, which would take another year." **http://www.poulvet.com**