# STUDIES OF SOME EFFECTS OF AMPHISTOMIASIS - IN RELATION TO HUMAN WELFARE

***Madhulika Mishra And Vinod Gupta,***

*Department of Zoology*

*University of Lucknow, Lucknow*

## ABSTRACT

*The present studies provide information about effects of Amphistomiasis on bovids which provide protein , energy , vitamins , and minerals in the human diet. The auther observed various effects on the haematological parameters of the blood goats and sheep infected with Paramphistomum spp. And Gastrothylax spp.*

**Keywords:** *Amphistomiasis, Meat protein, Paramphistomum spp. , Gastrothylax spp.*

## INTRODUCTION

The body needs a variety of the following five nutrients -protein, carbohydrate, fat, vitamins and minerals from the food we eat to stay healthy and productive protein is needed to build, maintain and repair muscels, blood, skin and bones and other tissues and organs in the body.

Meat has formed a part of human diet, since prehistoric time .Meat is of relatively high lipid content, which is of dietary significance, in provision of energy.It is an excellent source of vitamin B complex, especially thiamine, riboflavin, niacin, iron and phosphorus. The biological value of meat protein is 0.75 and net protein utilization 80, the digestibility of meat protein is 94to 97 on a scale of 100,the highest rating of any food as compared with 78to88 for plant proteins.

Animals provide protein, energy, vitamins and minerals in the human diet. The most important livestock source of protein and energy in the world are swine, beef, poultry, sheep and goat. Goats provide 0.8% of the total major animal source while lambs provide 2.9%

According to preliminary figures from the food and Agricultural organization of the United Nation (FAO,2006 a) 861,6 million people were undernourished during a period 2002-2004.

## MATERIALS & MATTERS

The blood samples from about one year olds goats and sheep were collected for haematological studies.

## HAEMATOLOGICAL STUDIES

10.0 ml of blood was collected in a vial containing ethylene diamine tetra acetic acid (EDTA), 1.0 mg per ml of blood.

## HAEMOGLOBIN

Haemoglobin estimation was done by using Sahil's haemoglobinmeter. The result is expressed as gram per dl. of blood.

## PACKED CELL VOLUME

Estimation of packed cell volume was done by using Wintrobe's haematocrit method. The result is expressed as ml. percent.

## TOTAL LEUOCYTE COUNT AND DIFFERENTIAL LEUCOCYTE COUNT

TLC and DLC have been done using slide method. The result of TLC is expressed as number per cu. mm. of blood. The result of DLC expressed in percent.

**Table-1**
**Effect of Paramphistomum spp. on haemoglobin concentration of blood in goats**

| Group* | Number of Parasites | Mean of Hb concentration (g/dl) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 10.70 | - |
| 2 | 5-10 | 9.30 | 13.08 |
| 3 | 25-30 | 8.20 | 23.36 |
| 4 | 45-50 | 7.20 | 32.71 |
| 5 | 85-90 | 5.70 | 46.73 |

* Number of animals in each group - 5
S. D. = 1.72
S. E. = 0.767
P> 0.001

**Table – 2**
**Effect of Gastrothylax spp. on haemoglobin concentration of blood in goats**

| Group* | Number of Parasites | Mean of Hb concentration (g/dl) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 10.70 | - |
| 2 | 5-10 | 8.90 | 16.82 |
| 3 | 25-30 | 8.00 | 25.23 |
| 4 | 45-50 | 6.90 | 35.51 |
| 5 | 85-90 | 5.10 | 52.34 |

* Number of animals in each group - 5
S. D. = 1.88
S.E. = 0.839
P> 0.001

**Table-3**
**Effect of Paramphistomum spp. on haemoglobin concentration of blood in sheep**

| Group* | Number of Parasites | Mean of Hb concentration (g/dl) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 12.80 | - |
| 2 | 5-10 | 11.90 | 7.03 |
| 3 | 25-30 | 10.70 | 16.41 |
| 4 | 45-50 | 8.90 | 30.47 |
| 5 | 85-90 | 6.30 | 50.78 |

* Number of animals in each group - 5
S. D. = 2.31
S. E. = 1.03
P> 0.001

**Table-4**
**Effect of Gastrothylax spp. on haemoglobin concentration of blood in sheep**

| Group* | Number of Parasites | Mean of Hb concentration (g/dl) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 12.80 | - |
| 2 | 5-10 | 11.40 | 10.94 |
| 3 | 25-30 | 10.30 | 19.53 |
| 4 | 45-50 | 7.90 | 38.28 |
| 5 | 85-90 | 5.70 | 55.47 |

* Number of animals in each group - 5
S. D. = 2.53
S. E. = 1.13
P> 0.001

**Table-5**
**Effect of Paramphistomum spp. on packed cell volume of blood in goats**

| Group* | Number of Parasites | Mean of PCV (ml. %) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 38.40 | - |
| 2 | 5-10 | 37.20 | 3.13 |
| 3 | 25-30 | 35.80 | 6.77 |
| 4 | 45 - 50. | 30.80 | 19.79 |
| 5 | 85-90 | 27.40 | 28.65 |

* Number of animals in each group - 5
S. D. = 4.16
S. E. = 1.86
P > 0.001

**Table-6**
**Effect of Gastrothylax spp. on packed cell volume of blood in goats**

| Group* | Number of Parasites | Mean of PCV (ml. %) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 38.40 | - |
| 2 | 5-10 | 36.80 | 4.17 |
| 3 | 25-30 | 33.00 | 14.06 |
| 4 | 45-50 | 28.60 | 25.52 |
| 5 | 85-90 | 25.20 | 34.38 |

* Number of animals in each group - 5
S. D. = 4.94
S. E. = 2.21
P > 0.001

**Table-7**
**Effect of Paramphistomum spp. on packed cell volume of blood in sheep**

| Group* | Number of Parasites | MeanofPCV (ml. %) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 42.80 | - |
| 2 | 5-10 | 41.60 | 2.80 |
| 3 | 25-30 | 39.40 | 7.94 |
| 4 | 45-50 | 33.20 | 22.43 |
| 5 | 85-90 | 29.80 | 30.37 |

* Number of animals in each group - 5
S. D. = 5.05
S. E. = 2.24
P> 0.001

**Table-8**
**Effect of Gastrothylax spp. on packed cell volume of blood in sheep**

| Group* | Number of Parasites | MeanofPCV (ml. %) | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 42.80 | - |
| 2 | 5-10 | 40.40 | 5.61 |
| 3 | 25-30 | 37.20 | 13.08 |
| 4 | 45-50 | 31.80 | 25.70 |
| 5 | 85-90 | 27.20 | 36.45 |

* Number of animals in each group - 5
S. D. = 5.69
S. E. = 2.54
P> 0.001

**Table-9**
**Effect of Paramphistomum spp. on total leucocyte count in blood in goats**

| Group* | Number of Parasites | Mean of T. L. C. per (cu. mm.) of blood | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 10,820 | - |
| 2 | 5-10 | 10,340 | 4.44 |
| 3 | 25-30 | 9,800 | 9.43 |
| 4 | 45-50 | 8,950 | 17.28 |
| 5 | 85-90 | 8,110 | 25.05 |

* Number of animals in each group - 5
S. D. - 971.44
S. E. = 433.68
P> 0.001

**Table-10**
**Effect of Gastrothlax spp. on total leucocyte count in blood in goats**

| Group* | Number of Parasites | Mean of T. L. C. per (cu. mm.) of blood | Decrease percentage |
|---|---|---|---|
| 1 | 0 | 10,820 | - |
| 2 | 5-10 | 10,050 | 7.12 |
| 3 | 25-30 | 9,390 | 13.22 |
| 4 | 45-50 | 8,880 | 17.93 |
| 5 | 85-90 | 8,090 | 25.23 |

* Number of animals in each group - 5
S. D. = 939.67
S. E. = 419.40
P> 0.001

## RESULT

Little information is available on the haematological studies of ruminants suffering with amphistomes in India. The parasite feeds on digested food and affects the blood picture of the host.Panzoo, G. R. and Bali, H. S. (1989),Rricherst,E.T.and Brown, A.P. (1909), Wintrobe, M.M. (1933), Wirth, D. (1950), Schalm, O.W. (1961), Wilkins, J.H. and Hodges, R.E.D.H. (1962), Deshaw, J.R. et. al (1969) and Mitruka, B. Mand Rawnsley, H.M. (1977)

In the present study it has been observed that with the increase in the number of parasites, there was a significant decrease in Hb concentration, PCV, TLC. The author has observed that decrease was more prominent in case of *Gastrothylax* spp. infection.

## DISCUSSION

The amphistomes *Paramphistomum* spp. and *Gastrothylax* spp. cause great harm to hosts. Gastrointestinal parasitism can decrease wool growth, length and diameter of the fibers. The wool becomes brittle due to the requirement of sulphur containing amino acids, which are essential for the formation of wool protein. These infections interfere with bone mineral metabolism leading to poor retention of calcium and phosphorus. Skeletal growth is reduced and the quality of the bone matrix and its degree of mineralization. The basic cause of the skeletal lesions is thought to be induced mineral deficiency coupled with impaired nitrogen and energy metabolism. (French, M.H.,1970).

Chronic paramphistomiasis in lambs with poor protein diet resulted in higher percentage of water content, lower nitrogen and phosphorus content of fresh meat with the change in the collagen structure of the skin(Mikhailova, P.et al., 1972).

Sheep and goats can transmit diseases and infections through meat and meat products, although the number of food born diseases associated with meat from small ruminants.

The demand of food is increasing with the exponential growth of population. The meat of goats and sheep is a protein rich diet that can solve food problem up to a great extent, hence of a great economic importance.

In view of the above facts it is evident that the amphistomiasis causes a great loss to bovids, which are major source of human diet. The objective behind undertaking the current work is to provide a nearly complete knowledge on amphistomiasis, which would be useful in disease diagnosis,prevention treatment and provide healthy animal food for the community.

## REFERENES


- Deshaw, J.R. Brown, S.O. and Szabuniewricz, M. (1969). Haematology of the Developing Juvenile Spanish Goat. South western Vet.22(4):287
- French.MH.(1970). Observation on the Goat.
- Mikhailova, P. Venkov, V. Gateva, SH. and Miteva, D. (1972). Effect of chronic paramphistomias is on some indices of meat and skins of yearling lambs Veterinarno Meditsinski Nauki.9(1):65-72
- Mitruka, B.M and Rawnsley, H.M.(1977).Clinical biochemistry and haematological reference values in normal experimental animals.
- Panzoo, G.R. and Bali, H.S. (1989). Haematological observation on experimentally infected animals with Gastrothylax crumenifer, (Creplin, 1847), otto 1896. Journal of Research, Punjab Agricultural University. 26(1):113-115.
- Reicherst, E.T. and Brown A.P. (1909). The Differentiation and specificity of Corresponding and organic Evolution. The Crystallography of Haemoglobins Washington, Carnegic Institute,32.
- Schalm, O.W.(1961). Veterinary Haematology. Lea and Febiger Publication, Philadelphia.
- Wilkins J.H and Hodges, R.E.D.H. (1962). observation on Normal Goat Blood. Royal Army Vet.Corps.J.33:7