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Haematological Manifestations due to helminthic infections in the domestic fowl, *Gallus gallus domesticus* Linnaeus 1758 from Darbhanga region (Bihar)

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Abstract

The present study focuses on the observation of haematological manifestation in *Gallus gallus domesticus* due to mixed helminthic infection with cestode parasites (*Rallietina* and *Davainea* etc) and nematode parasites (*Ascaridia* & *Hetrakis*). Out of 245 host bird examined, 145 were found infected with either singly or mixed infection. For study of effect on blood parameters only 43 (18 male + 25 female) birds were taken. The significant increase was observed in the size of RBC and number of WBC, MCV & MCH and however, reduction in the count of RBC, Hb, PCV in infected *Gallus* as compared with normal host bird. Thus, the haematological manifestations of the infected host bird *Gallus gallus domesticus* show that high infection (mixed ones) cause macrocytic anaemia, lymphocytosis etc due to deficiency of related factors.

Keywords: manifestations due, helminthic infections, *Gallus gallus domesticus*

Introduction

Haematological parameters are important in diagnosing the structural and functional status of the host's body, particularly the vertebrates which are inevitably subjected to various kinds of stresses that may lead to down regulation of immunity. In last few years many of the works on hematological parameters of vertebrates have been found related with toxicology but only few works have been reported in relation to hematological aspect of vertebrates related with parasitic infection. Infection due to helminth parasites has been a major health problem and may be considered an instance of physiological stress. And only little information is available so far available from literature on the hematological parameters of birds and fishes related with helminthic infection. Particularly significant observation has been reported related with tapeworm and nematode infection in the domestic fowl *Gallus gallus domesticus*. Various workers have studied heamatological investigation of some animals due to parasitic infection i.e. on pigeon^[1], duck^[2], *capra*^[3].

Therefore, in the present communication attempts have been made to analyze and correlate the haematological parameters of normal and infected domestic fowl, *Gallus gallus domesticus*.

Materials and Methods

Blood sample were collected aseptically by using sterile syringe and needle either directly from the heart and wingvein the freshly slaughtered fowl in the laboratory or the market shop. Immediately, the collected blood sample was transferred to sterile glass bottles containing EDTA as anticoagulant. For estimation of Hb, PCV, MCV and determination of WBC and RBC counts the routine methods were used^[4].

Results and discussion

The data on the blood parameters of *Gallus gallus domesticus* both normal (uninfected) and infected, sexwise, carrying mixed infection are presented in Table1 and graphically represented in Fig. 1.

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Table 1: Showing blood parameters of normal injected *Gallus gallus domesticus*.

S. No.	Blood Parameters	Normal Host		Infected Host	
		Male (n ₁ = 18)	Female (n ₂ = 25)	Male (n ₁ = 18)	Female (n ₂ = 25)
1.	RBC (X10 ⁶ /mm ³)	28.2 ± 2.3	26.4 ± 1.8	24.2 ± 1.2	21.0 ± 1.5
2.	WBC(X10 ³ /mm ³)	2.4 ± 0.28	1.98 ± 0.32	2.95 ± 0.32	2.58 ± 0.25
3.	Hb%	14.2 ± 0.83	13.5 ± 0.7	11.2 ± 0.7	10.2 ± 0.9
4.	PCV%	41.0 ± 1.8	38.5 ± 1.2	32.5 ± 3.2	31.2 ± 2.1
5.	MCV%	133.25 ± 2.25	130.4 ± 1.8	162.7 ± 4.5	158.45 ± 4.5
6.	MCH%	45.82 ± 1.15	43.82 ± 1.16	49.25 ± 2.5	48.32 ± 1.8

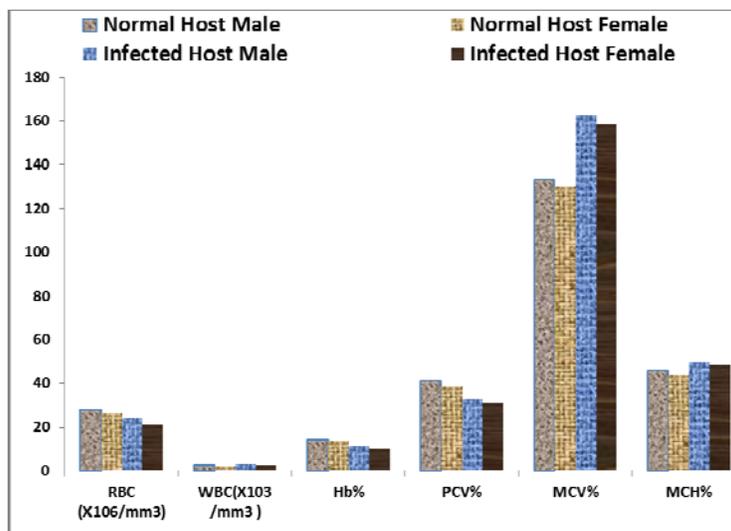


Fig 1: Graphical representation showing blood parameters for normal and infected *Gallus gallus domesticus*.

The present study indicates a very interesting feature that accounts for infected birds show restlessness and different types of helminth parasites produce different types of changes in the haematological parameters in birds, such as which are more-or-less comparable to those in mammals including man. The much similar results such as decrease in RBC count and increase in WBC count in the infected host when compared to normal / uninfected host [6]. The physiological significance of leucocytes such as their phagocytic actions, releasing toxin globulins from the lymphocytes must be stressed. For instance, the role of globulins in tissue repair and blood clotting seem obvious and thereby increase in no. of lymphocytes during parasite infection can be explained.

Conclusion

Due to helminthic infection whether tapeworm or nematode or even mixed ones there in change in the blood parameters of *Gallus gallus domesticus*. For instance, decrease in RBC count but increases in RBC size may be due to deficiency of vit B₁₂ - a maturation factor for RBC as leading to anaemia, macrocytosis, anisocytosis and poikilocytosis accompanied by reduction in Hb and PCV – values.

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