

## PREVALENCE OF TRICHOMONIASIS IN DOMESTIC AND WILD PIGEONS AND ITS EFFECTS ON HEMATOLOGICAL PARAMETERS

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### ABSTRACT

The present study was conducted to determine the prevalence of trichomoniasis and its effect on some blood parameters in pigeons. A total of 100 samples from the pigeons (50 wild and 50 domestic) were collected during the months of March and April 2005. Higher prevalence ( $P < 0.05$ ) was recorded in wild pigeons (60%) than in domestic pigeon (26%). The overall prevalence recorded was 43%, being non significantly higher in April (56%) than in March (30%). In infected pigeons, there was significant ( $P < 0.05$ ) decrease in hemoglobin concentration number of monocytes packed cell volume, body weight, than healthy birds. Likewise, the values of total leukocyte count, lymphocytes and eosinophils were higher significantly ( $P < 0.05$ ) in infected pigeons than the healthy ones. While, no significant difference was observed for heterophils count when infected and healthy birds were compared. It was concluded that trichomonad infection is quite common in wild, as well as in domestic, pigeons under the prevailing cage system.

**Key words:** Trichomoniasis, pigeons, wild, domestic, prevalence.

### INTRODUCTION

Protozoa inhabiting the digestive tract of birds are responsible for considerable economic losses. The infected birds show signs of dullness, depression and diarrhea, characterized by yellow pasty stools (Yang and Yang, 1995). Mortality in naturally infected untreated cases may be high alongwith very high morbidity rate which makes this problem more significant (Samour *et al.*, 1995).

*Trichomonas gallinae* causes avian trichomoniasis and affects upper digestive and respiratory tracts. It is found particularly in pigeons, but turkey, chicken, hawks, mourning doves, golden eagles, falcons and bustards may also be infected (Levine, 1995).

Avian trichomoniasis caused by *T. gallinae* is a disease of young birds, which may result in a high mortality in young pigeons within 10 days. A high incidence of latent infection (up to 90%) has also been reported (Soulsby, 1982). Prevalence of trichomoniasis in domestic and wild pigeons and its effect on hematological parameters have been described in the present paper.

### MATERIALS AND METHODS

A total of 100 (50 domestic and 50 wild) pigeons, maintained at the Zoological Garden, Lahore and Tollinton Market, Lahore, Pakistan during the months of March and April 2005, were included in this study. The faecal samples were taken directly from rectum using an ear bud type swab and throat swab or from oral cavity. They were processed through direct smear

method and then subsequently with Wright-Giemsa, staining technique (Coles, 1980) to identify the *T. gallinae*. Ten positive birds were randomly selected and designated as group 'A'. Another 10 clinically healthy birds negative for trichomoniasis were sampled for comparison and was designed group 'B'. After recording the body weight, blood samples (2 ml) were collected from wing veins of each bird and various hematological parameters like haemoglobin (Hb) concentration, total leukocytic count (TLC), heterophils, monocytes, lymphocytes, eosinophils and packed cell volume (PCV) were determined using standard techniques, as described by Rehman *et al.* (2003). The data thus obtained were statistically analyzed by using 't' test and test of proportions using "Z" distribution (Steel and Torrie, 1982).

### RESULTS AND DISCUSSION

The prevalence of avian trichomoniasis was significantly higher ( $p < 0.05$ ) in wild than domestic pigeons (Table 1). The lower prevalence in domestic pigeons might be due to more hygienic conditions and proper feeding which might have improved the management status and reduced the birds for exposing to vulnerable infection.

Prevalence rate in domestic and wild pigeons was higher in April (36 and 76%) than in March (16 and 44%). The difference in prevalence rate between the two months was non significant. The overall prevalence rate was 43% which is in accordance with that of Abdel-Motelib *et al.* (1997), who recorded the

prevalence of trichomoniasis as 40.6% in squab pigeons of Egypt.

Mckeon *et al.* (1997) observed higher incidence of 59% in racing pigeons in Australia. Overall incidence of trichomoniasis was 38.8% in budgerigars, Senegal doves and racing pigeons, which was close to the present prevalence results. Villanua *et al.* (2006) studied the prevalence of trichomoniasis in common wood pigeon in Spain and found 34.2 percent occurrence of *Trichomonas gallinae*. No significant difference in prevalence was found between males and females. Gulegen *et al.* (2005) recorded 75.78 percent prevalence rate in domestic pigeon. The variation might be due to many factors like climatic conditions, geographical difference, seasonal variation, resistance of the host, different feeding habits, age of birds, difference in housing conditions, etc.

The haematologic profile of infected and clinically healthy pigeons is presented in Table 2. The total leukocytic count (TLC), lymphocytes and eosinophils were higher ( $P < 0.05$ ) in infected birds. The heterophils

were also high in infested birds but statistically no significant difference was observed between diseased and healthy groups. These results are similar to the findings of Sekhar and Sinha (1986), who observed anemia, lymphocytosis, leukocytosis and eosinophilia in trichomoniasis.

The anemia was observed in diseased pigeons as there was a significant ( $P < 0.05$ ) decrease in Hb level and PCV in infested birds. Due to infectious process as indicated by the hematological parameters the infected pigeons remained under respiratory and digestive stress and could not gain weight properly whereas, the healthy pigeons gain more weight compared to the infected ones.

The results of the present study indicate that the trichomonad infection is quite common in wild, as well as in domestic, pigeons under the prevailing cage system. Risk factors leading to transfer and establish the disease, need further investigation to improve the management practice and to avoid infection in pigeons.

**Table 1: Prevalence of trichomoniasis in domestic and wild pigeons**

Months	Domestic pigeons		Wild pigeons		Overall infestation (%)
	Total No. of samples	No. of positive samples	Total No. of samples	No. of positive samples	
March	25	4(16%)	25	11(44%)	30 <sup>a</sup>
April	25	9(36%)	25	19(76%)	56 <sup>a</sup>
Total	50	13(26%) <sup>a</sup>	50	30(60%) <sup>b</sup>	43

Values with different superscripts within a row or a column differ significantly from each other ( $p < 0.05$ ).

**Table 2: Values of hematological parameters (mean  $\pm$  SE) and body weight (mean  $\pm$  SE) in healthy and infected pigeons (n=10)**

Parameters	Healthy	Infected
Hb (g/dl)	9.950 $\pm$ 0.4311 <sup>a</sup>	6.450 $\pm$ 0.2291 <sup>b</sup>
TLC ( $\times 10^3/\mu\text{L}$ )	27150.00 $\pm$ 567.89 <sup>a</sup>	30950.00 $\pm$ 437.48 <sup>b</sup>
Heterophils ( $\times 10^3/\mu\text{L}$ )	4645.00 $\pm$ 53.188 <sup>a</sup>	4950.00 $\pm$ 147.761 <sup>a</sup>
Monocytes	1470.00 $\pm$ 15.28 <sup>a</sup>	1310.00 $\pm$ 27.69 <sup>b</sup>
Lymphocytes ( $\times 10^3/\mu\text{L}$ )	1575.00 $\pm$ 343.6 <sup>a</sup>	1825.00 $\pm$ 226.7 <sup>b</sup>
Eosinophils ( $\times 10^3/\mu\text{L}$ )	427.50 $\pm$ 15.889 <sup>a</sup>	635.00 $\pm$ 36.729 <sup>b</sup>
PCV (%)	28.50 $\pm$ 0.5821 <sup>a</sup>	20.80 $\pm$ 1.052 <sup>b</sup>
Body weight (g)	360.50 $\pm$ 11.98 <sup>a</sup>	277.50 $\pm$ 12.79 <sup>b</sup>

Values with different superscripts within a row differ significantly ( $p < 0.05$ ) from each other.

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