

Prevalence and Pathology of *Trichomoniasis* in Free – Living Urban Pigeons in the City of Mosul, Iraq

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Abstract

The present study was undertaken to determine the prevalence of trichomoniasis and its pathology in pigeons. A total of 100 free living urban pigeons were collected during the months August and September 2007. The overall prevalence was 16%. In infected pigeons, yellowish – white masses of caseous necrotic material were seen grossly in the oral cavity, esophagus, crop, and proventriculus. Pale to yellow necrotic areas were noted in the liver. Multiple foci of caseous necrosis were seen microscopically in the oral mucosa together with heavy infiltration of inflammatory cells (mainly heterophils). Foci of necrotic inflammation were seen in the liver and there was thickening of the lining mucosa of the esophagus due to extensive infiltration of heterophils. Collections of necrotic material were seen in the mucosa and submucosa of the esophagus. Infection occurred more frequently in young than in adult pigeons. A higher prevalence of the infection was noted in male than in female pigeons. In all of the infected pigeons, trichomoniasis occurred in the absence of apparent secondary disease. It was concluded that trichomonad infection is fairly common in free living urban pigeons in the city of Mosul, Iraq.

Key words: Free living pigeons, prevalence, pathology, trichomoniasis, Mosul, Iraq.

Introduction

Trichomoniasis is an infection with the flagellated protozoan *Trichomonas gallinae* and is commonly found in pigeons, turkeys, chickens, hawks, mourning doves, golden eagles, falcons, and bustards (Levine, 1995). Infected birds show signs of dullness, depression, and diarrhea, characterized by yellow pasty stools. The disease is responsible for economic losses since it is associated with high mortality along with very high morbidity (Samour *et al.*, 1995). Among young pigeons, *T. gallinae* infection may result in a high mortality within 10 days and a high incidence of latent infection (up to 90%) has also been reported (Soulsby, 1982). The purposes of the present study were to describe the prevalence and pathological lesions of trichomoniasis in free – living urban pigeons in the city of Mosul, Iraq and to study the influence of factors such as age (immature vs. adult), sex, weight and health status of the pigeons on prevalence of the disease.

Material and Methods

A total of 100 free living urban pigeons (*Columba livia*) bought from the local markets of

Mosul city, Iraq during the months August and September, 2007, were included in this study. The body weight, health status, sex, and age of each bird were recorded. Gross examination of oral cavity was done and swab was taken from the throat or from the oral cavity. The swabs were processed through direct smear method and then subsequently with Wright – Giemsa, staining techniques (Coles, 1980) to identify the *T. gallinae*. Complete postmortem examination of each bird was performed and tissue specimens were collected from the oral cavity, esophagus, crop, intestines, liver, and the lungs. They were fixed in 10% neutral formalin solution for 48 to 72 hours and then washed under tap water, dehydrated in ascending grades of alcohol, cleared in xylol and embedded in paraffin wax (60 – 62 C melting point). Sections of 4 – 6 µm thickness were cut and stained with hematoxylin and eosin (Kiernan, 1999).

Results

The overall prevalence rate of avian trichomoniasis was 16%. Grossly, yellowish – white masses of caseous necrotic material were seen in the oral cavity, esophagus, crop, and proventriculus (Figs. 1 and 2). Pale to yellow necrotic areas were noted in the liver.

Microscopically, multiple foci of caseous necrosis were seen in the oral, esophageal and crop mucosae together with heavy infiltration of inflammatory cells (mainly heterophils) (Figs. 3 and 4). In some cases the necrotic area assumed concentric rings. Examination of the liver revealed multiple foci of necrotic inflammation and there was thickening of the lining mucosa of the esophagus due to extensive infiltration of heterophils. Collections of necrotic material were seen in the mucosa and submucosa of the esophagus. Multiple foci of necrosis together with infiltrations of inflammatory cells (heterophils and lymphocytes) were seen in the liver tissue. In the intestines, necrosis of the tips of some of the villi and the accumulation of the necrotic material in the intestinal lumen were seen.

Trichomoniasis occurred more frequently in young than in adult pigeons. A higher prevalence of the infection was seen in male than in female pigeons. The range of weight of affected pigeons was 300 – 400 gm and no secondary disease was found.

Discussion

In the present study, the prevalence of trichomoniasis in pigeons in the city of Mosul, Iraq was 16%. In comparison, prevalence of trichomoniasis was 40.6% in squab pigeons of Egypt (Abdel – Motelib *et al.*, 1997). Toro *et al.*, (1999) recorded the prevalence of trichomoniasis in free living pigeons in the city of Santiago as 11%. The overall prevalence rate of trichomoniasis in domestic and wild pigeons maintained at the Zoological Garden, Lahore and Tollinton Market, Lahore, Pakistan was found to be

43% (Saleem *et al.*, 2008). A higher incidence of trichomoniasis (59%) was reported in racing pigeons in Australia (McKeon *et al.*, 1997). The incidence of trichomoniasis was 38.8% in budgerigars, Senegal doves, and racing pigeons. Villanua *et al.* (2006) found the prevalence of trichomoniasis in common wood pigeon in Spain as 34.2%. Gulegen *et al.* (2005) reported 75.78% prevalence rate in domestic pigeon. In a study monitoring the presence and annual variation of *T. gallinae* for 6 years in a local mourning dove population using hunter – killed doves, a 5.6% of the tested samples were positive for the presence of *T. gallinae* (Schulz *et al.*, 2005). Anderson *et al.* (2009) recorded a prevalence rate of trichomoniasis of 1.7% in house finches, 0-6.3% in corvids and 0.9% in mockingbirds. Krone *et al.* (2005) reported that the prevalence of trichomoniasis in northern goshawks from the Berlin area of northeastern Germany was 69.7% in 1998, 73.0% in 1999, 55.8% in 2000 and 62.9% in 2001. The variation of the prevalence rate in the various studies is expectable in view of the many factors that affect occurrence of the disease such as the climatic conditions, geographical difference, seasonal variation, resistance of the host, different feeding habits, age of birds, difference in housing conditions, and others. A similar explanation has been made by others (Saleem *et al.*, 2008).

In this study, trichomoniasis occurred more frequently in male than in female pigeons. This result is in discrepancy with that of Villanua *et al.* (2006) who found no significant difference in prevalence between males and females. This discrepancy could be



Figure. 1. Yellow necrotic masses of variable size in the oral mucosa of a pigeon with trichomoniasis.



Figure. 2. Whitish necrotic masses in the mucosa of the esophagus and the crop of a pigeon with trichomoniasis

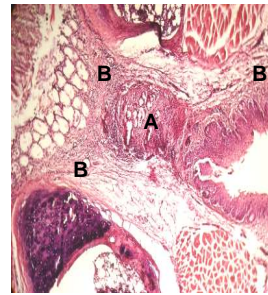


Figure.3. Photomicrograph of the oral cavity of a pigeon with trichomoniasis. The accumulation of necrotic material (A) and the infiltration of inflammatory cells (B) in the submucosa could be seen. H&E. X90.

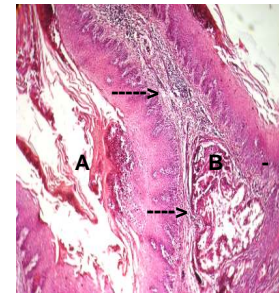


Figure.4. Photomicrograph of the wall of the crop of a Pigeon with trichomoniasis. Necrotic material could be seen on the mucosa (A) and submucosa (B). Infiltration of inflammatory cells could be also seen in the submucosa (arrow). H&E. X90.

due to the difference in the types of pigeons used in the two studies. The finding of trichomoniasis more commonly in young than in adult pigeons is in accordance with that of others (Butcher, 2003; McDougald, 2003). Carrier pigeons are known to transmit Trichomonads to their young during feeding (Butcher, 2003). In the present study, trichomoniasis was reported in apparently healthy pigeons. This finding may indicate that trichomoniasis could occur in the absence of secondary disease.

The pathological lesions described in the present study were basically inflammatory, ulcerative, and necrotic in nature. They were more predominant in the oral cavity, esophagus, crop and proventriculus. Similar lesions have been described for naturally – occurring and experimentally induced trichomoniasis in pigeons (Kennedy, 2001; McDougald, 2003).

Conclusion

Result of the present study indicated that trichomonad infection is fairly common in free living urban pigeons in Mosul city, Iraq. Severe necrotic lesions were seen in the oral cavity, esophagus, crop and proventriculus of infected pigeons. A higher occurrence of the disease was found in young than in adult and in male than in female pigeons. The presence of a secondary disease was not a prerequisite for the occurrence of trichomonad infection.

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References

1. Abdel Motelib, T.Y.; Gala, B.El.G; El-Gamal and Galal, B. (1997) Some studies on *Trichomonas gallinae* infection in pigeons. *Assiut Vet. Med. J.* 30(9): 277-288.
2. Anderson, N.L.; Grah, R.A.; Van Hoosear, K. and BonDurant, R.H. (2009). Studies of trichomonad protozoa in free ranging songbirds : prevalence of *Trichomonas*

- gallinae in house finches (*Carpodacus mexicanus*) and corvids and a Novel trichomonad in mockingbirds (*Mimus polyglottos*). *Vet. Parasitol.* 161 (3-4): 178-186.
3. Butcher, G.D. (2003). Pigeon canker. VM 75, Veterinary Medicine – Large Animal Clinical Science Department, Florida Cooperative Extension Service, Institute of Food And Agricultural Science, University of Florida. EDIS Web Site at <http://edis.ifas.ufl.edu>.
4. Coles, E.H. (1980). Veterinary Clinical Pathology. 3rd ed., W.B. Saunders Company, Philadelphia, USA.
5. Gulegen, E.; Senlik, B. and Akyol, V. (2005). Prevalence of trichomoniasis in pigeons in Bursa province, Turkey. *Indian Vet. J.* 82(4): 369-370.
6. Kennedy, M.J. (2001). Trichomoniasis in birds. Alberta Agriculture, Food and Rural Development, Agri – facts, Practical Information for Alberta's Agriculture Industry, Agdex 663 – 34 (Internet).
7. Kiernan, J.A. (1999). Histological and histochemical methods: theory and practice. 3rd ed., Butterworth – Heinemann. Oxford, UK, pp: 111-113.
8. Krone, O.; Altenkamp, R.; and Kenntner, N. (2005). Prevalence of *Trichomonas gallinae* in northern goshawks from the Berlin area of northeastern Germany. *J. Wildlife Dis.* 41(2): 304-309.
9. Levine, N.D. (1995). Veterinary Protozoology. Iowa State University Press, Ames, Iowa, USA, pp: 809-812.
10. McDougald, L.R. (2003). Trichomoniasis. In: Y.M. Saif and H. J. Barnes; J.R. Glisson; A.M. Fadly, L.R. McDougald; D.E. Swayne: Diseases of poultry. 11th ed., Iowa State Press, Iowa, pp: 1006-1008.
11. McKeon, T.; Dunsmore, J. and Radial, S.R. (1997). *Trichomonas gallinae* in budgerigars and columbid birds in Perth, Western Australia. *Aust. Vet. J.* 75(9): 652-655.
12. Saleem, M.H.et.al.(2008). Prevalence of trichomoniasis in domestic and wild pigeons and its effects on hematological parameters. *Pakistan Vet. J.* 28(2): 89 –91.
13. Samour, J.H.; Bailey, T.A. and Cooper, J.E. (1995). Trichomoniasis in birds of pery (order Folconiforms) in Bahrain. *Vet. Rec.* 136: 358-362.
14. Schulz, J.H.; Bermudez, A.J. and Millspaugh, J.J. (2005). Monitoring presence and annual variation of Trichomoniasis in mourning doves. *Avian Dis.* 49: 387-389.
15. Soulsby, E.J.L. (1982). Helminths and Arthropod Protozoa of Domesticated Animals. 7th ed., Baillere Tindall, London, UK.
16. Toro, H.; Saucedo, C.; Borie, C.; Gough, R.E. and Alcaïno, H. (1999). Health status of free living pigeons in the city of Santiago. *Avian Pathology* 28(6): 619-623.
17. Villanua, D.; Hofle, U.; Rodriguez, L.P. and Gortazar, C. (2006). *Trichomonas gallinae* in wintering common wood pigeons *Columba palumbus* in Ibis, Spain. *Intern. J. Avian Sci.* 148 (4): 641 – 648.

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