

Therapeutic management to concurrent infection of *Haemoproteus columbae* and *Trichomonas* spp. in domestic rock pigeons

E. Tamileniyan, M. Jeevitha, K. Karthika*, M. Veeraselvam, A. Latchumikanthan, R. Velusamy, M. Saravanan, S. Yogeshpriya and K. Jayalakshmi

Dept. of Veterinary Medicine, Dept. of Veterinary Parasitology, Veterinary College and Research Institute, Orathanadu, Tamil Nadu veterinary and Animal Sciences University

Abstract

Two domestic rock pigeons were presented to Veterinary Clinical Complex, VC & RI, Orathanadu, TANUVAS with the history of circling, rotating its head, complete inappetence and regurgitation. On clinical examination bird appeared dull, depressed and circling of head appreciated and also noticed the presence of *Pseudolynchia canariensis*. Blood smear examination revealed a characteristic halter shaped gametocytes of *Haemoproteus columbae* encircling the nucleus of erythrocytes and the crop fluid examination revealed the presence of *Trichomonas gallinae*. Faecal sample examination revealed the absence of intestinal parasites. The birds were treated with oral Chloroquine @5mg/kg body weight and Metronidazole @50 mg as total dose along with the multivitamin supplementation. The whole flock in the house hold were treated with Permethrin (0.25%) spray by external application to control vector population. After five days of the treatment the clinical condition of the birds were reviewed which showed complete recovery without any complications.

Keywords: Pigeon, Avian malaria, Canker, Chloroquine, Metronidazole.

Domestic pigeons (*Columba livia*) belong to the Columbidae family and are commonly seen in urban areas worldwide. Pigeons and doves make about 50% of all birds maintained in captivity for food, recreational activity, entertainment, and display (Harlin and Wade, 2009). Protozoal infections can cause serious impacts on birds, including stunted growth, reduced egg production, and susceptibility to diseases (Ashford, 1971). The disease caused by *Haemoproteus columbae* in pigeons is called as pseudo malaria or pigeon malaria transmitted by *Pseudolynchia canariensis*, affects domestic as well as wild pigeons which is highly fatal to young pigeons (Soulsby 1982). *Trichomonas gallinae*, a flagellated protozoan, causes avian Trichomoniasis, a disease that affects the upper digestive system of birds, especially pigeons. The disease has been described as canker. A digestive or canker disease was characterised by pyogenic oropharyngitis, ingluvitis, proventriculitis, and descending hepatitis (Chi *et al.*, 2013). This paper presents the concurrent infection of *Haemoproteus columbae* and *Trichomonas gallinae* in a rock pigeon with its therapeutic management.

Case History and Observation

Two Domestic rock pigeon of young age were presented to the Large Animal Medicine Unit of Veterinary Clinical Complex, Veterinary College

and Research Institute, Orathanadu, TANUVAS with a history of circling, rotating its head, complete inappetence and regurgitation. Nine pigeons in the flock of thirty-seven had already died with the same symptoms. On clinical examination ruffled feather, ocular discharge from both the eyes, white cheesy material in the oral region and ulceration of tongue were noticed and in addition *Pseudolynchia canariensis* was also recovered from the feathers. Blood from wing vein was collected in a vacutainer containing Heparin as an anti-coagulant and crop fluid was also collected by using sterile butterfly catheter. Faecal examination of the birds revealed absence of parasitic ova. The haematological analysis revealed RBC of $1.7 \times 10^6 / \mu\text{l}$, Haemoglobin 4.3 g/dL, PCV 15% which shows the bird was anaemic and WBC of $11.5 \times 10^3 / \mu\text{l}$, Heterophils 56%, Lymphocytes 39% and Eosinophils 4%. Blood smear study showed halter shaped immature gametocytes of *Haemoproteus columbae*. Crop fluid on microscopical examination in wet mount revealed *Trichomonas gallinae*.

Treatment and Discussion

Based on the clinical observations and laboratory findings the pigeon was found to have multiple infections with *Haemoproteus columbae*, *Pseudolynchia canariensis*, and *Trichomonas* spp. The birds were treated with oral Chloroquine @5mg/kg B.W. and Metronidazole @50mg as total dose twice a day with supportive multi-vitamin syrup for 7 days

*Corresponding author: karthika1988.6@gmail.com

was supplemented as it removes stress and enhances immunity. The pigeons recovered on fifth day without any complications. Permethrin (0.25%) was recommended as a topical insecticide for controlling vectors in pigeon habitats.

Haemoproteus columbae, a haematozoan homologous to the malaria parasite *Plasmodium*, causes pigeon malaria in both domestic and wild pigeons (Selvaraj *et al.*, 2013). The regional variation in *H. columbae* prevalence in pigeons is primarily influenced by vector abundance, in which our study confirms the presence of *Pseudolynchia canarenensis*. Clinical symptoms of *H. columbae* infection include anorexia, lethargy, depression, dyspnea, circling movement, and diarrhoea (Maharana and Kumar, 2016) which is in agreement with our study. Chloroquine, an antimalarial drug, is utilised to treat *Haemoproteus* sp. infection. Medications are not generally suggested for treating, since they are non-pathogenic parasites in most of the condition (Ritchie,

1999). Buparvaquone is highly effective in treating clinical *H. columbae* infection in pigeons, according to previous research (Razmi *et al.* 2011). Young pigeons, known as “squabs,” are often infected with *Trichomonas gallinae*, which may ultimately result in mortality. However, adult and recovered pigeons can also be carriers without showing clinical signs (Mohamed *et al.*, 2022). The clinical condition is characterised by greenish fluid or cheesy materials in the mouth and crop, which is a typical lesion in all canker birds (Seddiek *et al.*, 2014). This study reports greenish diarrhoea, yellowish cheesy material in oral cavity, ruffled feathers, weakness, and depression, identical to Paul *et al.* (2015). Metronidazole and Ronidazole are the most often used drugs to treat cankers globally. The administration of metronidazole in our case showed effective results, supporting Hochleithner *et al.* (2021) observations. Control measures like vector control, proper cleaning of droppings, provision of separate waterer and feeder and routine prophylactic measures were advised.



Fig. 1. Rock pigeon showing torticollis



Fig. 2. Cheesy white material in the oral cavity



Fig. 3. *Pseudolynchia canarenensis* recovered from the wing

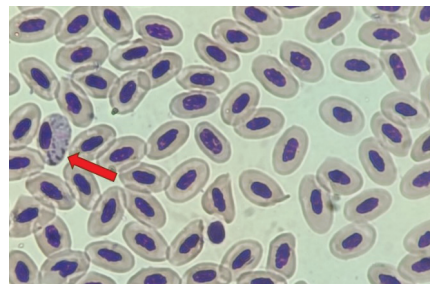


Fig. 4. Halter-shaped gamonts of *Haemoproteus columbae* in the nucleated RBC

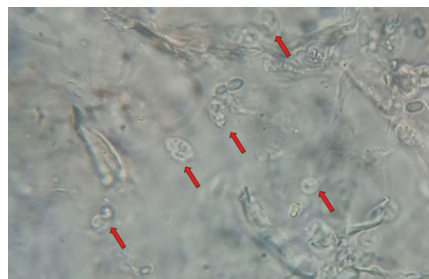


Fig. 5. *Trichomonas* sp., in crop fluid

Acknowledgement

The authors express their sincere gratitude to The Dean, Veterinary College and Research Institute, Orathanadu, TANUVAS, for their invaluable support and the provision of research facilities. We wish to express our deep gratitude to The Professor and Head, Veterinary Clinical Complex, VCRI, Orathanadu, for their unwavering support.

References

- Ashford RW (1971) Blood parasites and migratory fat at Lake Chand. *Ibis* 113:100–101.
- Chi JF, B Lawson, C Durrant, K Beckmann, S John, AF Alrefaei, K Kirkbride, D Bell, AA Cunningham and KM Tyler, (2013). The Finch epidemic strain of *Trichomonas gallinae* is predominant in British non-passerines. *Parasitol.* P: 1-12.
- Harlin R, Wade L (2009) Bacterial and parasitic diseases of Columbiformes. *Vet Clin North Am Exot Anim Pract* 12:453–473.
- Hochleithner M, Hochleithner C (2021). The prevalence of *Trichomonas gallinae* in budgerigars (*Melopsittacus undulatus*) in a Veterinary Clinic in Vienna between 2000–2019. *Vet. Med.*, 66: 490–493.
- Maharana BR, Kumar B (2016) Pseudomalaria in a domestic pigeon: a case report. *J Parasitic Dis*: 1–3.
- Mohamed HM, Saad AS, Khalifa MM, Abdel-Maogood SZ, Awadalla SM, Mousa WM (2023). Detection and molecular characterization of *Trichomonas gallinae* recovered from domestic pigeons in Egypt. *Parasit. Res.*, 122(1): 257-263.
- Paul, T.K., Amin, Alam, M.A., Rahman, M., Sarker, Y.A., & Rizon, M. (2016). Occurrence of Pigeon Diseases At Khulna Sadar, Bangladesh. *Bangladesh Journal of Veterinary Medicine*, 13, 21-25.
- Razmi GR, Soltani M, Afkhami A, Fourazanfar F (2011) Therapeutic effects of Butalex, Diminazen, Imidocarb and Chloroquin against *Haemoproteus* species infection in Pigeons. Paper presented during second international congress of veterinary pharmacology (ICVP), Tehran, Iran.
- Ritchie B.W., (1999). *Avian Medicine: Principles and Application*. HBD International Inc, Delray Beach FL.
- Seddiek SA, El-Shorbagy MM, Khater HF, Ali AM (2014). The antitrichomonal efficacy of garlic and metronidazole against *Trichomonas gallinae* infecting domestic pigeons. *Parasit. Res.*, 113: 1319-1329.
- Selvaraj, P., Umesh, C.G., Preethi, U., Sumathi, D., Nambi, A.P., & Prathaban, S. (2013). *Haemoproteus columbae* infection in a flock of pigeons. *Indian Journal of Field Veterinarians*, 9, 61-62.
- Soulsby, E.J.L., 1982. *Helminths, Arthropods and Protozoa of domesticated animals*. Seventh edn. ELBS, London. Pp. 1 – 772.