Successful therapeutic management of pigeon (Columbia livia domestica) malaria with chloroquine

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ABSTRACT

Pigeons from two different flocks were presented to Teaching Veterinary Hospital of Institute, Ludhiana with the history of dullness, depression, decreased feed intake, twisting of neck, incordination, difficulty in maintaining balance and death. Physical examination of the affected birds revealed weakness, ruffled feather, lameness, dyspnea, lethargy and poor growth. Blood smear examination revealed presence of pigmented intraerythrocytic halter shaped gametocytes of Hemoproteus columbae. The birds were treated with Chloroquine and multivitamin. After 5 days of treatment mortality was stopped in the birds and remaining birds regain their appetite and became alert and active. During a follow up period of one month no recurrence of disease and any further mortality were observed in the pigeon flocks.

Key words: Chloroquine, Hemoproteus columbae, Malaria parasite, Pigeon.

Pigeons are ubiquitous birds and can be found virtually in every town and city around the globe. Infections with Haemoproteus spp. are common in pigeons. Hippoboscidae (Pseudolynchia canariensis) is an important parasite of pigeon in warm and tropical areas and transmit Haemoproteus columbae (H. columbae) that causes pigeon malaria (Msoffe et al., 2010). Prevalence of H. columbae infection in pigeons has been reported in different parts of the world (Valkiunas et al., 2004; Adlard et al., 2004; Youssefi et al., 2010). Previously H. columbae was considered relatively innocuous and of little clinical significance. This communication reports an outbreak of H. columbae in pigeons and its successful therapeutic management with Chloroquine.

Ten pigeons from two different flocks having strength of 200 and 250 were presented to Teaching Veterinary Hospital, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India with the history of sudden death, dullness, depression, decreased feed intake, incordination and difficulty in maintaining balance, twisting of neck with normal water intake (Fig. 1, 2). Physical examination of the affected birds revealed weakness, ruffled feather, lameness, dyspnea and poor growth. The blood samples were collected from the wing vein using an insulin syringe. Blood smears were prepared and fixed with methanol and stained with giemsa staining technique. The slides were examined under light microscopy using an oil immersion objective. The pigeons were visually inspected for the detection of any ectoparasite. Ectoparasites were identified using a stereomicroscope and taxonomic keys. The birds were treated with Chloroquine (Resochin, Tab 250mg, Bayer Ltd.) @2200mg/liter of drinking water (Karamba and Mukhtar, 2012) for 7 days along with multivitamin (Verol, Ranbaxy Ltd). Owner was advised to spray the pigeon house with Permethrin (0.25% spray) along with regular cleaning of the litter to control flies (Permin and Hansen, 1995).

Affected birds had decreased feed intake, lameness, incordination, weakness, dyspnea, lethargy, swelling of eyelid in few birds and poor growth. Some birds died with out showing any clinical signs. Blood smear examination revealed presence of pigmented intraerythrocytic halter shaped gametocytes (Zinkl, 1986, Fig. 3). Visual inspection of pigeon revealed presence of fly Pseudolynchia canariensis beneath the feathers. Based on history, physical and clinical examination and blood smear examination, the birds were diagnosed to be suffering from pigeon malaria (H. columbae) infection.

The sporozoits of H. columbae are released into the blood of bird by bite of infected fly. The sporozoits commence the exoerythrocytic stage of schizogony in the endothelial cells of blood vessels particularly in lungs producing merozoits. These merozoits develop into micro and macro gametocytes. These gametocytes are taken up by fly and there is development of zygote inside the fly. Nucleus of the zygote divide to produce sporozoits which reaches to salivary gland of fly ready to be injected in the other host (Margret and Petrak, 1969).

The clinical signs observed in the birds might be due to pantothenic acid deficiency which probably resulted from competition between the malarial parasite and the host...
for pantothenic acid (Margret and Petrak, 1969). Previously *H. columbae* was considered to be of little clinical significance but recently it has been observed that the malaria parasite causes wide spread necrosis accompanying development of exo-erythrocytic megalomoronts in muscle, heart, liver and lungs leading to fatal infection. During heavy infections, the lungs of bird are filled up with meronts, which block up the capillaries. As a result, pneumonia like symptoms develops which may cause death of bird (Marques *et al.*, 2007). The inflammatory reaction around meronts is well pronounced. Decrease in glycogen, protein, RNA in the liver, spleen, brain has been recorded in the infected birds. During heavy infection, this parasite adversely affects health of birds with loss in the body weight, retarded growth, unthriftiness, fertility disturbances, emaciation and death in the birds (Marques *et al.*, 2007).

The birds showed marked improvement after 5 days of treatment with Chloroquine. The birds regain their appetite, became alert, active and bright. Mortality was stopped among birds. Chloroquine is a 4-amino- inoline anti malarial agent. It probably influences haemoglobin synthesis by raising intravesicular pH in malarial parasite cells. It also interferes with synthesis of nucleoprotein by the parasite leading to its destruction. Incidence of *H. columbae* with similar clinical signs have been reported by many workers from different countries (Mushi *et al.*, 2000; Murata, 2002; Marques *et al.*, 2007; Varshney *et al.*, 2014).

From the present study it may be concluded that *H. columbae* is common blood parasite of pigeon causing morbidity and mortality and the Chloroquine is highly effective drug for treatment of *H. columbae* infection in pigeons.

**REFERENCES**


