



Research Article

Pigeon Trichomoniasis in Al-Qassim, Saudi Arabia

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ABSTRACT

This study aims to investigate the incidence rate and pathological changes of canker in domestic pigeons. The incidence rate was determined as 50% and the mortality rate was 100%. Clinical examination of birds illustrated tremors, torticollis, paralysis, emaciation and throat swelling. While necropsy inspection revealed a suppurative oropharyngitis, proventriculitis, hepatitis, liver fatty degeneration and brain congestion. Histopathological analysis showed pyogenic and necrotic inflammation of the digestive tract. Hepatic necrosis, granulomas, fatty change, hemosiderosis and protozoan parasites were demonstrated. Myocardial muscle and brain necrosis were also noted. This study concluded that pigeon trichomoniasis is a fatal disease causes an economical losses due to high mortalities (100%) in adult birds than scuabs and further investigations are needed.

Key words: Trichomoniasis, Pigeon. Al-Qassim, Saudi Arabia

INTRODUCTION

Necropsy remains one of the golden techniques used in diagnosis of various poultry diseases and subsequently provides a concrete base for prophylaxis. Data concerning pigeon researches is scanty however, it suffer from a vast range of infections. Trichomoniasis is one of protozoan parasitic diseases of global distribution responsible for economic morbidities and mortalities of the susceptible birds (Harmon *et al.*, 1987, Bunbury *et al.*, 2008, Frozln *et al.*, 2010, Neimanis *et al.*, 2010). The disease found highly prevalent among wild pigeon (60%) than in the domestic pigeon (Salem *et al.*, 2008). Pigeon trichomoniasis which caused by a flagellate protozoan; *Trichomonas gallinae* has a various pathological forms. A digestive or canker disease is a principle form manifested by a pyogenic caseous oropharyngitis, ingulvitis, proventriculitis and subsequent a descending hepatitis (Rose, 2005., Hafidh *et al.*, 2011, Chi., *et al.*, 2013). A concurrent pericarditis and meningoencephalitis is also reported. Histopathological, upper digestive tract necrosis, suppurations and mucosal hyperplasia were noted. Focal hepatic granulomas with multinucleated giant cells, vacuolar necrosis and basophilic pleomorphic parasites were also observed (WSC, 2013). Multifocal or diffused tubulointerstitial nephritis was also reported (Borji *et al.*, 2011). Vacular degenerative and necrotic encephalitis and splenitis were seen (Shivarprasad, 2002). Clinico-pathological analysis of pigeons with trichomoniasis revealed a marked decrease in hemoglobin concentration, increased total white blood cells mainly

lymphocytes and eosinophils without any significant different values in heterophils, significant elevation of cytokines with obvious Liver and brain dysfunctions (Salem *et al.*, 2008, Ali *et al.*, 2014). Diagnosis of Trichomoniasis is based on the clinical signs, characteristic necropsy changes and microscopic demonstration of myriad flagellates in direct scrapings wet or impressions Giemsa stained smears from caseous lesions. Direct microscopy and PCR are still considered as a confirmative diagnostic tools (Permin and Hansen, 1998, Borji *et al.*, 2011, Patzal *et al.*, 2012, Arenales *et al.*, 2014). This study aims to investigate the incidence rate and pathological changes of canker in domestic pigeons in al Qassim area. Saudi Arabia.

MATERIALS AND METHODS**Birds**

Morbidus birds from different pigeon farms were imported either for practical practice or for diagnostic purposes during a routine student practical sessions at the laboratory of pathology in the department of veterinary medicine. Field visit for one pigeon flock (n=500) was conducted after owner complains of mortalities among adult birds. Al-Qassim, Ssudi Arabia.

Clinical examination

Clinical examination of the birds was carried out. Clinical signs were noted, incidence and mortality rates were calculated according to owner records during the winter season. 2014.

Necropsy

A total of 22 morbidus birds were humanely euthanized and necropsied according to (Thierry, 2000, Kidsadagon, 2012). Gross pathological changes were noted.

Histopathology

For routine paraffin wax histopathology, specimens from pyogenic or necrotic lesions were incised, fixed in 10% formal saline, processed and stained with H&E as described by (Hewitson and Dabry, 2010).

Microscopy

Scrapings and impression smears were collected from caseous or necrotic lesions. Direct wet smears prepared by immediate adding of sterile normal saline drops to scraping smears, then coverslipped and microscopically examined. Dry scraping, impression and blood smears were fixed with acid alcohol, air dried and stained with Giemsa for microscopic demonstration of protozoan parasites according to (Soulsby, 1982, Kidsadagon, 2012).

RESULTS

Histopathology

Suppurative pharyngo- esophagitis, esophagitis and proventriculitis reactions were noted with obvious necrosis and desquamation of epithelial layers. Liver sections showed marked coalescent vacuoles represent a massive hepatocellular necrosis. Hepatic granulomatous inflammation with inflammatory cells; heterophills, macrophages, giant cells and eosinophils were perivascularly infiltrated. Myriad parasites were detected within the granulomas and necrotic reactions. Hepatocellular fatty degeneration was also seen. Hemosiderin laden macrophages were heavily scattered in a perivascular areas which signed for extramedullary hematopoiesis response (Fig. 3). Brain sections showed mild vaculation and gliosis reactions.

Microscopy

The incidence and mortality rates, clinical observations and necropsy findings were done and described as illustrated in Table (1) and Fig (1).

Giemsa stained wet smears showed a protozoan flagellate within necrotic debris. While tissue impression and blood smears were negative for any protozoan parasites.

DISCUSSION

Diagnostic pathology still considers necropsy as one of the golden techniques used in diagnosis of poultry diseases and subsequently provides a concrete base for treatment and/or prophylaxis. The current study revealed that trichomoniasis is one of the constrains facing pigeon breeding in the area, where the incidence rate was detected as 50%, the mortality rate was 100% as well as a continuous complains of deaths from such disease, these results were came in line with (Harmon *et al.*, 1987, Bunbury *et al.*, 2008, Frozln, *et al.*, 2010, Neimanis *et al.*, 2010). The clinical signs of examined birds showed sever tremors and torticollis nervous signs, however gross brain congestion, microscopic vacuolar necrosis were noted in

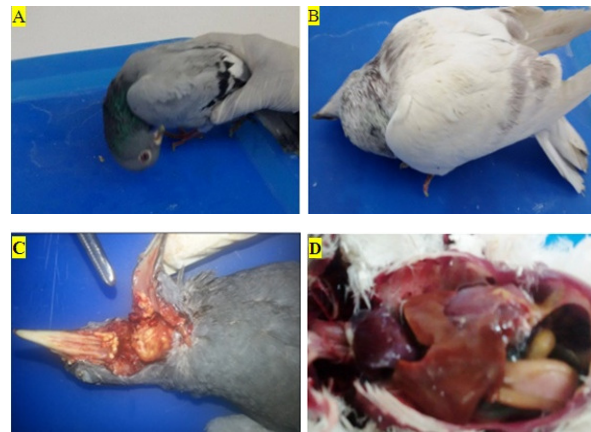


Fig. 1: Pigeon showing tremors and torticollis (A&B) with gross lesions of oropharynx caseation (C) and necrotic fatty liver (D).

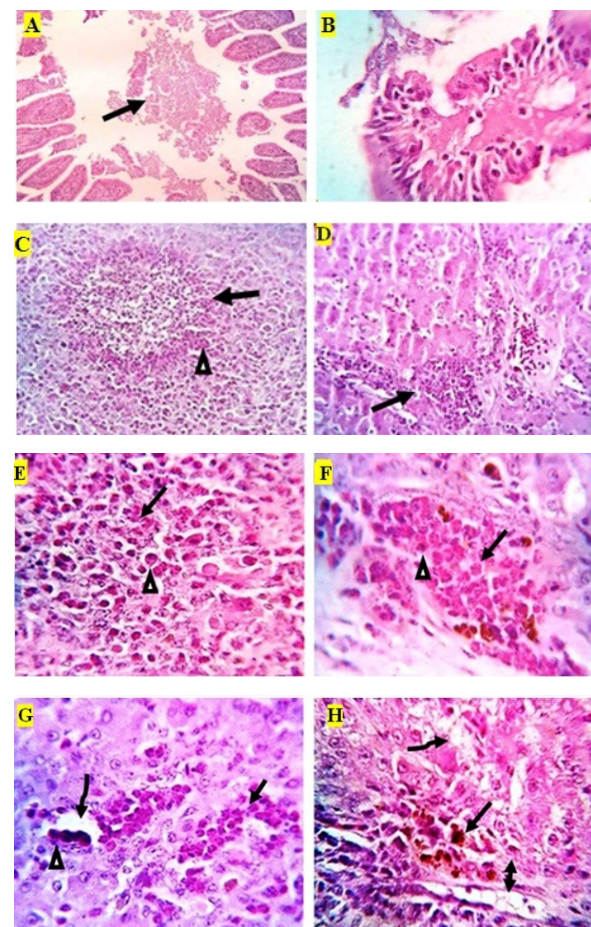


Fig. 2: Pigeon's histopathological sections:

A&B: Proventriculitis, necrosis with epithelial desquamation; arrows (10X, 100XH&E); **C:** Liver, granuloma (arrow) with Langhan's giant cell (arrowhead) (10X H&E); **D:** Liver, perivascular infiltrations and capillary congestion arrow (40X H&E); **E:** Liver, pyriiform parasites represent trichomonads (arrowheads) and fibrosis (arrow) (100XH&E); **F:** Liver, infiltration of heterophills and eosinophils (arrow) (100XH&E); **G:** Liver, necrosis, vacuolation (screw arrows), trichomonads (arrowhead) and heterophills (arrow) (100XH&E); **F&H:** Liver, depositing of brown hemosiderin granules and fat droplets (bi-head arrow) (100XH&E).

Table 1: Incidence, mortality rate, clinical signs and necropsy observations

Incidence rate (%)	Mortality rate (%)	clinical signs of the infected birds	Necropsy findings of birds (%)
50	100	Emaciation	Emaciation 100
		head tremors & torticollis	Oropharyngeal suppuration 100
		huddling of wings	Crop swelling& necrosis 100
		Throat swelling	Proventriculosis caseation 0
		Enlarged crop	Liver congestion or necrosis 18
		Asphyxia	Fatty Liver 9
			Splenomegaly 0
			Heart necrosis 4.5
			Lung abscess 4.5
			Brain congestion 18
			swelling of nervous plexus 0
			Internal parasites 27.3

necropsied birds and the previous studies evidenced pigeon encephalopathies with brain dysfunction due to trichomoniasis (Shivarprasad, 2002, Ali *et al.*, 2014). Other macroscopic findings; emaciation, caseous oropharyngeal suppurations necrotic engulvitis, necrotic proventriculitis, necrotic hepatitis with fatty degeneration and splenitis were reported and agreed with most of the previous investigators (Rose, 2005, Hafidh *et al.*, 2011, Chi, *et al.*, 2013). Histopathology noted an obvious upper digestive tract and proventriculosis necrosis with desquamation of epithelial layers. While severe vacuolar hepatic necrosis, granulomas, demonstration of myriad parasites, fatty change, perivascular infiltration of eosinophilic heterophils, hemosiderin phagosomes were characteristic for the diseases (Shivarprasad, 2002, Borji *et al.*, 2011, Patzal *et al.*, 2012, WSC, 2013, Arenales *et al.*, 2014). Perivascular hemosiderin laden macrophages aggregation signed for extramedullary hematopoiesis response as a phenomenon of anemia consequences. Emerging of anemia might due to prolonged starvation anemia or for noxious hemolytic toxins secreted by parasites. Severe hepatic, cardiac muscle and brain necrosis referred to generalized anoxia accompanied asphyxia of trichomoniasis. Internal helminths which were resulted in intestinal occlusion immunosuppression might participate in emerging of such opportunistic infections.

Conclusion and recommendation

This study concluded that pigeon trichomoniasis is a fatal disease causes economical losses due to high mortalities 100% in adult birds than scuaubs in the region. Further investigations are needed.

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