GROSS AND HISTOPATHOLOGICAL STUDIES ON KIDNEYS OF JAPANESE QUAIL (*Coturnixcoturnix japonica*)

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Received 11-1-2015 Accepted 24-2-2015

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ABSTRACT

Investigation was undertaken to study the incidence and nature of disorders in kidney of different age groups of Japanese quail. Out of three hundred two birds, 127 quails showed alterations in their kidneys, 25 had changes of hyperaemia prominent in cortex than medullary region with one or more cysts. Thirty one quails had shown changes of haemorrhages whereas 48 showed changes of nephritis and 20 had the changes of acute interstitial nephritis. Remaining birds were found normal except mild swelling.

KEYWORDS: Gross, Histopathology, Kidney, Japanese quail

INTRODUCTION

Japanese quail (*Coturnixcoturnix japonica*) belongs to class Aves, family *phasianidae.* It also known as coturnix quail. They are hardy and easy to handle and occupy place in avian research throughout the world. Reports on the incidence of renal disease in the avian patient vary, but renal disease is common in poultry and birds of prey (Pollock, 2006,). Due to similarity to chicken in several aspects, quails have been used as pilot animal for pathological, nutritional and physiological studies.

MATERIALS AND METHODS

The study was conducted on kidneys of 302 Japanese quails of different age groups and sex, which were naturally dead showing hyperaemia, granulomatous haemorrhagic lesions. The samples were collected from Central Poultry Farm, Patna and privately owned poultry farms. These were preserved in 10% formal saline solution for processing and histopathological changes. Smears were prepared and stained with haematoxylin and counter stained with 1.0% eosin solution. For study of infection, infestation and disease conditions the sections were stained with standard procedure.

RESULTS AND DISCUSSION

Out of 302 naturally dead Japanese quails examined for pathological changes in their kidneys collected from Central Poultry Farm Patna and private owned poultry farms, 127 had gross lesions showing following type of renal diseases.

Macroscopical changes

Twenty five (19.7 per cent) quails showed reddened and swollen kidney. When kidneys were cut through, there was little presence of blood on the cut surface. Thirty one (24.4 per cent) specimens of kidneys were swollen and revealed pinpoint haemorrhages. The kidneys showed such foci in 48 (37.8 per cent) cases on the cut surface. A few kidneys were also moderately enlarged. The consistency of such kidney was soft. Twenty three (18.11 per cent) specimens of kidney were slightly swollen and grayish and when the kidneys were cut urates were noticed on the cut surfaces (Table 1). Ureters were dilated and packed with such material.

Microscopical changes

Renal Hyperemia

Kidneys of 25 (19.7 per cent) quails showed the changes of hyperemia in which intertubular blood vessels and blood vessels of glomeruli were found engorged with blood having numerous nucleated erythrocytes. Lining of epithelium of tubules of medulla showed mild changes of degeneration in which parenchymatous degenerations were prominent. Changes of hyperemia were more prominent in the cortex than medullary region of affected kidneys (Fig. 1). Hyperemic changes were seen in both the kidneys of 14 (11.2 per cent) quails whereas rest of 11 (8.66 per cent) quails showed hyperemia in only one kidney. Neumann *et al.* (1973) and Gratal and Kohler (1968) reported similar observations in fowl.

Fig.1. Section of kidney of quail showing changes of hyperemia (H & E x 100)

Renal Hemorrhage

Kidneys of 31 (24.4 per cent) quails had shown th ood cells were found in large number in the parenchyr Fig. 2). Due to infiltration of large number of erythr the changes of pressure atrophy associated with mi ge. The present observation was in accordance with nha (1985).

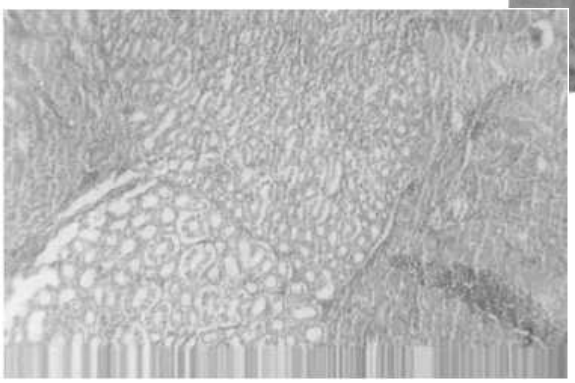

Fig. 2. Section of quail kidney showing changes of parenchyma (H & E x 100)

Nephritis

Forty eight (37.8 per cent) quails had shown changes of different types of nephritis, which are as follows.

(a) Nephrosis

Fatty degenerative changes were seen in some places. Changes of necrosis were also seen in epithelial cells of some of the tubules. Desquamated cells occluded the lumen of such necrotic

tubules. Nephrosis was observed in 23 (18.11 per cent) quails.

Table 1. Distribution of various kinds of renal diseases in naturally dead quails

Sl. No.	Type of renal diseases	Total number of quails showing renal disease	Percentage of positivity
1.	Renal hyperemia	25	19.70
2.	Renal hemorrhage	31	24.40
3.	Acute nephritis (degeneration type)	48	37.80
4.	Others	23	18.11
Total		127	100.00

(a) Acute Interstitial Nephritis

Kidneys of 20 (15.74 per cent) quails had shown the changes of acute interstitial nephritis. Inflammatory cells were found infiltrated in the interstitial tissues between the tubules. Diffuse infiltration of leucocytes was seen in kidneys of 5 (3.93 per cent) quails (Fig. 3). Focal interstitial nephritis was seen in kidneys of 12 (9.44 per cent) quails. Changes of hyperemia were also seen in these affected kidneys. This change was mostly confined in cortical areas of kidneys. Intertubular blood vessels were found dilated and were filled with excess of blood.

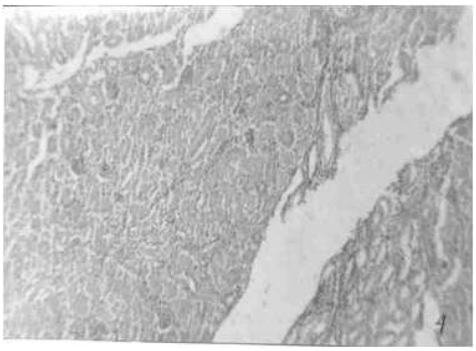

Fig. 3. Section of quail kidney showing changes of acute interstitial nephritis with leucocytes infiltrated in interstitial tissues between tubules (H & E x 100)

(a) Chronic Interstitial Nephritis

Kidneys of only 3 (2.36 per cent) quails had shown the changes of chronic interstitial nephritis in which there was thickening of interstitial tissues with proliferation of fibrous connective tissue. This change was seen at both cortex and medullary regions of kidneys.

(b) Suppurative Nephritis

Two quails had shown the presence of abscess in their kidneys. These small abscess contained yellow colour pus. Tissue sections of the affected kidneys showed the changes of suppurative nephritis. The observations regarding nephritis were in accordance with the findings of Gross (1940) and Greenwood and Blyth (1948) who reported 13% nephritis in fowl. Hicks (1958) reported 29.6% and Dudley *et al.* (1941), Blaxland *et al.* (1977) reported 6% nephritis in fowl.

Cysts

Grossly kidneys of 4 (3.14 per cent) quails were apparently normal except they were mildly swollen.

These kidneys showed the presence of one or more cysts in the medullary regions. Single layer of cells and fibrous connective tissues lined these cysts. Due to presence of cysts, surrounding normal tissues of kidneys resulted in pressure atrophy and degenerative changes of lining epithelium of tubules. There was focal desquamation of epithelium from basal layer of tubules. Lumen of affected tubules showed the presence of desquamated necrosed epithelium (Fig. 4). Similar changes were observed by Carlson *et al.* (1974).

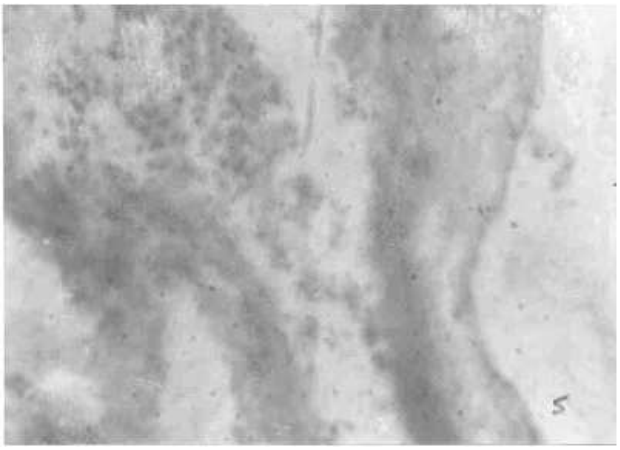

Fig. 4. Section of quail kidney showing the presence of cysts in the modularly region lined by fibrous connective tissue (H & E x 100)

Change in Blood Vessels of Kidneys

Blood vessels of affected kidneys had shown two types of alteration. In acute nephritis, intertubular veins were highly dilated. Majority of these blood vessels were engorged and filled with excess of blood. Similar changes of hyperemia were present in the blood vessels of glomeruli of kidneys showing acute inflammation. These blood vessels also contained excess blood.

ACKNOWLEDGEMENT

The authors are thankful to the Associate Dean-cum – Principal, Bihar Veterinary College, Patna-800014 and General Manager, Central Poultry Farm, Patna for their kind co operation and providing the necessary facilities to carry out the investigation

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