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INCIDENCE OF MAREK'S DISEASE IN COTURNIX COTURNIX JAPONICA IN AN ORGANIZED FARM

***K Nagarajan¹, D Thyagarajan¹, C Balachandran², N Pazhanivel² and S Arunkumar³**

¹*Institute of Poultry Production and Management, Tamil Nadu Veterinary and Animal Sciences University, Nandanam, Chennai-600 035*

²*Department of Veterinary Pathology, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Vepery, Chennai-600 007*

³*Department of Veterinary Parasitology, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Vepery, Chennai-600 007*

** Author for Correspondence*

ABSTRACT

Marek's disease (MD) was observed in Japanese quails. Gross lesions were confined mostly to the proventriculus, spleen and liver. Microscopic lesions were commonly seen in the spleen and liver. Suggestive lesions of MD were observed in seven out of 20 birds grossly. Organs were collected from all the 20 necropsied birds. The birds which were not revealing gross lesions were also tested for MD virus antigen by precipitation test using positive serum. All the seven affected birds with prominent tumour lesions were showing line of precipitation by agar gel precipitation test. Three birds without visible lesions were also positive for AGPT while others were negative. This is the first case of occurrence of Marek's disease in the institute. The possible source of infection of the Japanese quails could be a spread from chickens reared within the farm premise.

Key Words: Marek's Disease, Japanese Quail, Lymphoproliferative Disease.

INTRODUCTION

Marek's disease, a herpesvirus-induced lymphoproliferative disease, is known to affect chickens and other domesticated and wild birds. Japanese quails are susceptible to experimental infection with the JM strain of MD virus (MDV) (Khare *et al.*, 1975 and Crucillo *et al.*, 2010). In spite of the susceptibility of Japanese quails to experimental infection with a chicken strain of MDV, there are only a few reports available on the natural infection in Japanese quail. Several lymphoproliferative diseases in Japanese quails have been reported including Marek's disease, lymphoid leucosis and reticuloendotheliosis (Pradhan *et al.*, 1985). The present study deals with the spontaneous occurrence of MD in the Japanese quails raised in an Institute of Poultry Production and Management (IPPM) farm where MD has not been reported in Japanese quails so far.

MATERIALS AND METHODS

Four varieties of *Coturnix Coturnix Japonica* are maintained at Institute of Poultry Production and Management (IPPM), a constituent research unit of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) since 1982. Population strength of birds were ten thousand numbers of brown variety and one thousand numbers of white, white breasted and golden varieties each are maintained. All of the germplasms have good livability with better egg producing ability and it is well adapted to local climatic condition of Tamil Nadu. Germplasm seed stocks are sold as parent stock to different hatcheries. Approximately 2,00,000 quail chicks per year are sold to commercial quail farming agents in Tamil nadu. On average, around 2-3% brooder mortality and 0.5% adult mortality are recorded daily. Sudden raise in mortality (15%) over the period of a month was noticed. Mortality of 20/150 number of adult layer birds at the age group of 16 weeks were observed in particular flock in a single day. On post-mortem examination, pathological changes suggestive of Marek's disease were observed in 7 out of 20 birds. Feathers and skin pieces from necropsied birds were collected for preparation of antigen. Antigens were

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tested for Marek's disease virus by Agar Gel Precipitation Test (AGPT). Morbid materials from different tissues of Japanese quails having gross tumours of visceral organs (Liver, spleen and proventriculus) were collected and fixed in 10 per cent buffered formal saline. Sections were embedded in paraffin and stained with haematoxylin and eosin for routine histopathological examination.

RESULTS AND DISCUSSION

During routine post-mortem examination seven adult Japanese quails out of 20 died from the particular flock had visceral tumours. In these birds, the spleen and liver had enlargement with multiple nodular glistening grayish white foci or tumors (Figure 1). Proventriculus was diffusely enlarged and thickened and had a granular appearance. In some cases, whitish thickening were seen in the duodenum and small intestine. Microscopical examination of tissues revealed accumulation of heterogeneous population of pleomorphic lymphoid cells in the various organs. Mucosa, lamina propria and muscular layers of the duodenum and small intestine were infiltrated with pleomorphic lymphoid cell population (Figure 2). In liver, lymphoproliferative lesions with perivascular cell cuffing, diffuse infiltration into the parenchyma were observed (Figure 3). In proventriculus, lymphoid cells of various sizes were infiltrated into the proventricular glands and submucosa (Figure 4). Of the 20 birds necropsied, organs collected from birds which did not reveal gross lesions were also tested for the presence of MDV antigen by AGPT using positive serum. All the seven affected bird with prominent tumour lesions were showing line of precipitation by AGPT.



Figure 1: Liver of the Japanese quail affected by MD revealed diffusely enlarged and glistening white grayish foci of tumors.

Three birds without visible lesions also were reacted by AGPT while others remained negative. The mortality pattern and lesions found in the necropsied birds were similar to the experimental inoculation of the day old Japanese quails with the JM strain of MDV (Khare *et al.*, 1975; Crucillo *et al.*, 2010). In the present disease outbreak, the birds could have contracted the disease from chickens reared in the adjacent sheds within the farm premise. The morphological features of tumour cells in the Japanese quails was similar to that in chickens with MD, and peripheral nerves were not affected as reported in the classical form of MD (Sharma *et al.*, 1972 and Halpin *et al.*, 1967). In Japanese quails, however, all of these organs except liver are less commonly affected. Present observations indicated that the spleen, proventriculus, liver and duodenum are the target organs for MDV in Japanese quails. Involvement of lungs and other

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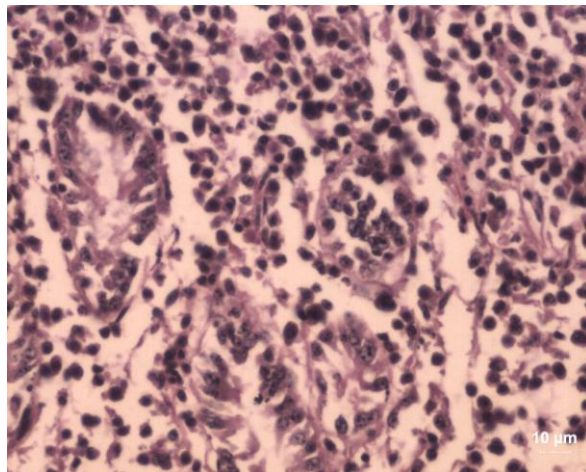


Figure 2: Small intestine of the Japanese quail affected by MD revealed infiltration of lymphoid cells of various sizes in the lamina propria, mucosa and muscular layers. (HE stain) 400X.

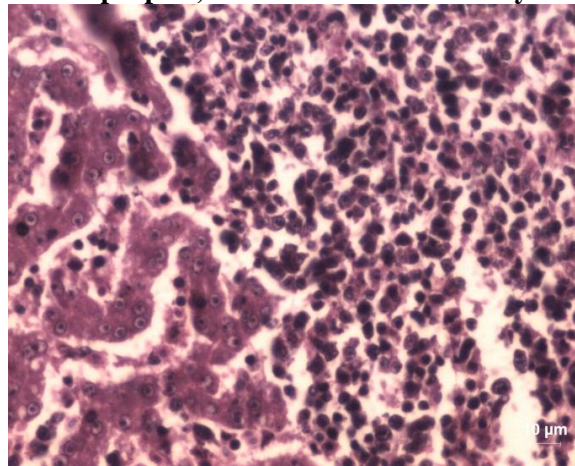


Figure 3: Liver of the Japanese quail affected by MD revealed proliferation of lymphoid cells of various size and reticulocytes in parenchyma with mitotic figures. (HE stain) 150X.

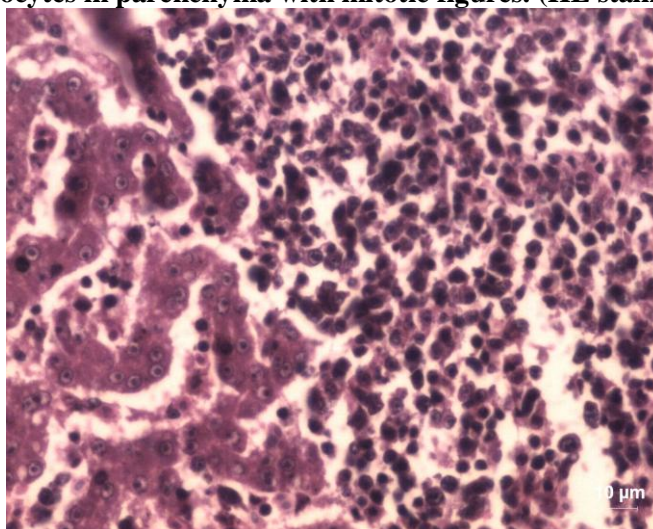


Figure 4: Proventriculus of the Japanese quail affected by MD revealed infiltration of lymphoid cells of varying size in to the proventricular gland and submucosa. (HE stain) 400X.

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visceral organs including skin and nerves has been reported in Japanese quails experimentally infected with the JM strain of MDV while in the present study, involvement of skin, lung and nervous tissue were not observed.

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