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## Marek's disease outbreak in adult Rajasri layer chicken

**M Lakshmi Namratha, KB Ashok Kumar Reddy, Y Ravi Kumar and M Lakshman**

### Abstract

Marek's disease was diagnosed upon routine postmortem examination conducted at Department of Veterinary Pathology, College of Veterinary Science, Hyderabad. There was a sudden mortality of about 6-8 birds per day in 12 weeks old Rajasri chicken. Clinically, birds showed weakness, diarrhoea, pale comb and mortality of 70 birds out of 220 birds (31.8%) for a period of one week. Upon necropsy examination, gross lesions observed were hepatomegaly, splenomegaly, thickening of proventriculus and multiple greyish white nodular growths on proventriculus, liver, intestines and pancreas. Impression smears of liver prepared for cytological examination. Impression smears from liver were prepared for cytological examination. Impression smear of liver and Histopathological examination of liver, spleen, pancreas and proventriculus revealed numerous proliferating pleomorphic lymphocytes which is suggestive of Marek's disease.

**Keywords:** Marek's disease, Rajasri, nodular growths, histopathology, lymphoid cell infiltration

### Introduction

Marek's disease (MD) first described in 1907 by Jozsef Marek which is caused by herpesvirus [1]. The virus has been a continuous problem to the poultry industry due to the continuous evolution of field virus strains and emergence of increasingly new pathogenic strains. Economic consequences of Marek's disease virus (MDV) infection are leading to mortality in layers, breeders and condemnation at the time of slaughter and processing in broilers [2]. Immunosuppression was recognized as a consequence of virulent MDV infection [3, 4]. The Feather follicles epithelial cells are the important source of infection and infected dander is readily disseminated in farm premises and inhaled by healthy birds [5]. The disease is manifested in various forms a) Neurological form – Acute infiltration of central nervous system and peripheral nervous system leads to paralysis of legs and wings; b) Visceral form – Tumours in heart, ovaries, testis, muscles and lungs both in males and females; c) Cutaneous form – Tumours of feather follicles.

Clinical signs in MDV infection include weakness, diarrhoea, paralysis of legs and wings, grey eye and skin lesions. Visceral form of MD involves tumour development in organs without involvement of peripheral nerves [6]. Microscopically, mononuclear cell infiltration in liver, spleen, kidneys, muscle and other visceral organs [7].

The main aim of the present communication is to study the rare occurrence and diagnosis of the of Marek's disease in Rajasri.

### Materials and Methods

A sudden mortality in 12 weeks old Rajasri birds was reported at Poultry Research Station (PRS) Rajendranagar, College of Veterinary Science, Hyderabad. Marek's disease was diagnosed in 70 out of 220 birds evaluated for a period of one week. The disease was diagnosed based on gross, cytological and histopathological findings. At the time of postmortem examination, impression smears of liver were taken and stained with Leishman's stain by following standard protocols for cytology. The tissue samples of liver, proventriculus and spleen slices (1×1 cm<sup>3</sup>), collected and fixed in 10% neutral buffered formalin (NBF). Microscopic slides were prepared by using Haematoxylin and Eosin (H&E) stain for histopathological examination [8].

### Results

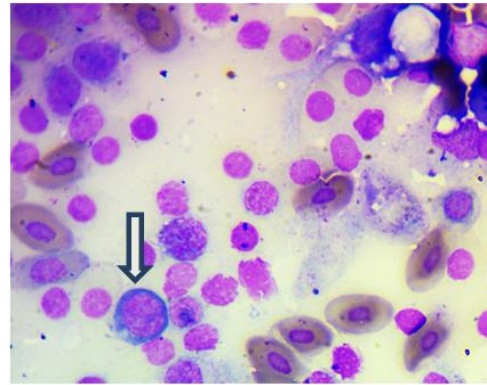
Marek's disease was diagnosed in 70 birds out of 220 based on gross lesions, cytological examination and histopathological findings. Clinically, the affected birds showed anorexia, weakness, diarrhoea, pale comb and death. Gross examination revealed an abnormal thickening of proventriculus in some birds and multiple greyish white nodular growths on liver, spleen, proventriculus and intestines (Fig. 1). The texture of the cut surface of the nodules was greyish, smooth and firm. Hepatomegaly with rounded edges and splenomegaly was noticed in majority birds subjected for PME (Fig. 2). The gross findings were suggestive of lymphoproliferative disease. Impression smears of liver revealed prominent pleomorphic lymphoid cell population *viz.*, lymphoblasts, small and medium lymphocytes with large and round nuclei (Fig. 3). Liver section revealed pleomorphic neoplastic round cells with clearly defined cell borders and a small amount of eosinophilic cytoplasm and degeneration of hepatocytes (Fig. 4), sections of proventriculus revealed prominent lymphoid cell infiltration into muscular and glandular region with mild degenerative changes in the glandular epithelium (Fig. 5). The sections of spleen also revealed aggregates of pleomorphic lymphocytes (Fig. 6).



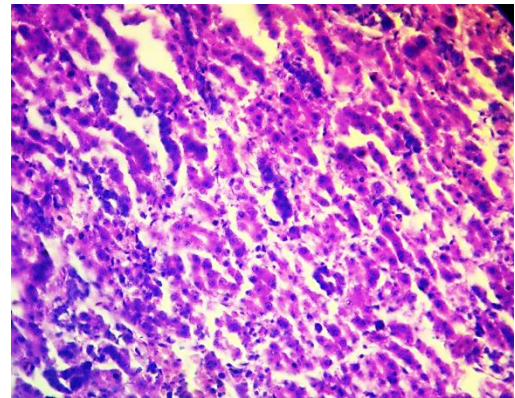
**Fig 1:** Diffuse nodular growths on the proventriculus, intestine and pancreas (arrow)



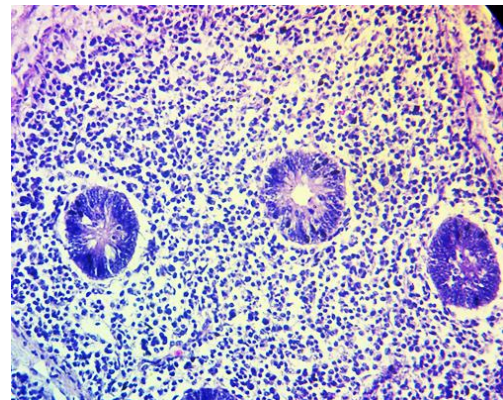
**Fig 2:** Liver showing numerous greyish white coalescing tumour nodules with splenomegaly



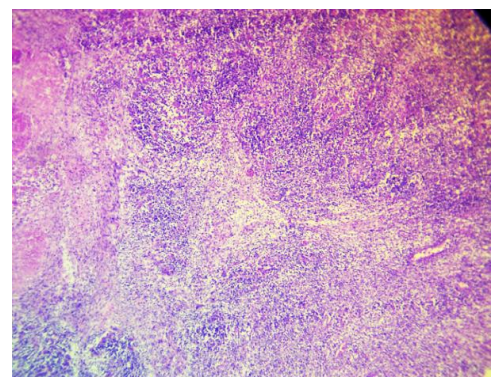
**Fig 3:** Impression smear of liver showing pleomorphic lymphoid cell infiltration (arrow). Leishman's stain x100



**Fig 4:** Liver section showing lymphoid infiltration with degeneration of hepatocytes (H&E x 400)



**Fig 5:** Section of proventriculus showing severe infiltration of lymphoid cell and degenerative changes in the glandular epithelium (H&E x400)



**Fig 6:** Splenic parenchyma was diffusely infiltrated with pleomorphic neoplastic round cell population (H&E x100)

## Discussion

The gross lesions like hepatomegaly, splenomegaly and abnormal thickening of proventriculus, cytological examination of liver impression smears showed pleomorphic lymphocytes and histological examination of different organs revealed a note worthy cellular changes like pleomorphic lymphocytic infiltration into muscularis of proventriculus and hepatocytes were replaced with pleomorphic lymphocytes and exudate in majority sections. In some sections, the proventriculus showed hypertrophy which was due to the deposition of aggregates of pleomorphic small lymphocytes, lymphoblast and plasma cells in the mucosa and glands. Multiple organ damage was due to proliferation and infiltration of the pleomorphic lymphocytes. Similar gross lesions in chicken were reported by previous authors [6, 7, 9]. Cytology and histopathology of various visceral organs revealed diffuse lymphocytic infiltration which was in accordance with the findings of previous authors [7, 9].

## Conclusion

In conclusion, the present study describes the outbreak of Marek's disease among the Rajasri which was diagnosed on the basis of characteristic gross, cytological and microscopic changes in tissues.

## Acknowledgement

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