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# Concurrent infection of Marek's disease and Avian Reticuloendotheliosis virus in commercial layer chicken

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**Abstract**
Six dead commercial layer birds of 53 weeks age were examined to know the cause of death. The total flock size was 50,000 and birds were raised in cages from day one of age. The total mortality over a period of 20 weeks was 8%. The birds appeared dull, depressed and emaciated. At necropsy liver, spleen and kidney revealed enlargement, mottling and greyish tumourous foci and nodular growth on surface and were firm in consistency and smooth when cut. Histopathology of liver, spleen and kidney were corroborated the gross lesions.

**Keywords:** Layer chicken, Marek's disease, Reticuloendotheliosis virus, Histopathology

## Introduction
Marek's Disease (MD) is a highly contagious oncogenic and neuropathic disease of chickens caused by herpes virus and spreads in the environment through feather follicle and infect the birds through inhalation and responsible for great economic losses to the poultry industry world wide (Calnek and Adldinger, 1971) [2]. Sporadic outbreaks of MD have been reported recently throughout the world in vaccinated flocks including India (Raja *et al.,* 2009, Gopal *et al.,* 2012) [8, 5].
Reticuloendotheliosis virus (REV) is an immunosuppressive and neoplastic condition affecting chickens caused by gamma retro virus belongs to retroviridae family (Buchen – Osmond, 2004) [1] and transmitted by a horizontal route by direct contact between birds, indirectly by some insect vectors like mosquitos and also by a vertical route by eggs (Motha *et al.,* 1987) [6]. The clinical disease associated with REV is acute reticular cell neoplasia, chronic lymphomas and an immunosuppressive runting disease (Crespo *et al.,* 2002) [4]. Various reports explained that REV as contaminant of Marek's disease and Fowl pox vaccines which resulted in delayed growth, feather abnormalities, anemia and leg paralysis (Wei *et al.,* 2012) [10].
The present paper describes the concurrent infection of Marek's disease and Avian Reticuloendotheliosis virus in commercial layer chicken raised entirely in cages.

## Materials and Methods
Six dead commercial layer birds of 53 weeks of age were examined to know the cause of death with a case history of dull, depressed and emaciated and 6% loss in production with8% mortality over a period of 20 weeks. The total flock size was 50,000 and all the birds were raised in cages from day one of age. The persistant mortality (0.3% per week) was recorded from 34 to 43 weeks of age and it increased at the age of 44 weeks from 0.3% to 0.5% per week. The total mortality over a period of 20 weeks (34 to53 weeks) was 8%.
A detailed necropsy was conducted on dead birds and gross lesions were recorded. The tissue samples from different portions of liver and kidney were collected in 10% formalin, processed and sections were stained with haemotoxylin and eosin.

## Results and Discussion
### Gross pathology
The affected birds appeared dull, depressed and emaciated. At necropsy liver revealed enlargement with mottling with a few greyish foci on the surface (Fig.1). Spleen showed enlargement with greyish embedded nodules of 3 mm diameter on the surface (Fig.2). Kidney showed distinct enlargement with irregular greyish areas which indistinctly merged with the parenchyma (Fig.3).

**Fig 1:** Chicken - MD and REV- liver Showing enlargement with mottling with a few greyish foci on the surface.

**Fig 2:** Chicken - MD and REV- Spleen showing enlargement with greyish embedded nodules (3 mm diameter) on the surface

**Fig 3:** Chicken- MD and REV - Kidney showed distinct enlargement with irregular greyish areas on the surface

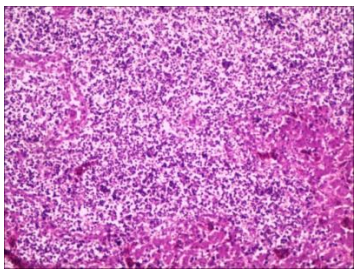

**Fig 4:** Chicken- MD and REV – Liver - Moderate pleomorphic lymphocyte infiltration (PLC) in hepatic parenchyma – 100X

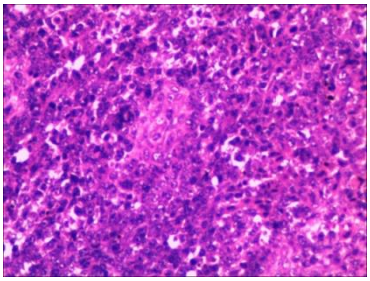

**Fig 5:** Chicken- MD and REV – Spleen - Focal moderate reticuloendothelial (RE) cell infiltration in splenic parenchyma – 400X

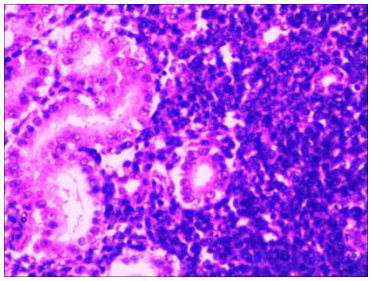

**Fig 6:** Chicken- MD and REV – Kidney - Moderate lymphoreticular cell infiltration in renal parenchyma-400X

## Histopathology

Histopathology study of concurrent infection of Marek's disease and Avian Reticuloendotheliosis virus suspected liver showed moderate pleomorphic lymphocyte infiltration (PLC) in hepatic parenchyma (Fig.4). Spleen showed focal moderate reticuloendothelial (RE) cell infiltration in splenic parenchyma (Fig.5). In kidney moderate lymphoreticular cell infiltration in renal parenchyma were seen (Fig.6).

Concurrent infection of Marek's disease and Avian Reticuloendotheliosis virus was diagnosed in commercial Layer chicken of 53 weeks age. Clinically birds showed 6% egg production loss, dull, depressed and emaciated with 8 percent mortality over a period of 20 weeks. Liver sections revealed moderate pleomorphic lymphocyte infiltration (PLC) in hepatic parenchyma (Chacon *et al.*, 2019) [3]. Focal moderate RE cell infiltration in renal parenchyma were noticed. In kidney moderate lymphoreticular cell infiltration in renal parenchyma were also seen (Sharma *et al.*, 2017) [9]. The histopathological changes of liver, spleen and kidney observed in this study agreed with the findings of earlier workers (Ponnusamy *et al.*, 2018) [7].

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