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Analysis of poultry disease pattern using post-mortem examination data in Ramanathapuram district: A retrospective study

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Abstract
A Retrospective study on the results of post mortem examination conducted on poultry carcasses at Veterinary University Training and Research Centre (VUTRC), Ramanathapuram, a constituent unit of Tamil Nadu Veterinary and Animal Sciences University, Tamil Nadu, India was carried out over a period of four years from 2015 to 2018 in order to find out the frequency of occurrence of a particular disease in this geographical location and species, age and season wise pattern of disease occurrence. Mostly, the pure desi chicken were found to be the main target for many of the infectious diseases (12.1%) followed with hybrid chicken Giriraja (7.4%) and Turkey (5.3%). Japanese Quails were least affected (1.4%). Birds at the age group of 0-8 wks was most susceptible (13.2%) rather than 9-20 wks (12.7%) and >20 wks (10.3%). Disease prevalence was reported highest during February (31.5%) and lowest during July (6.0%). The North East monsoon represented the period of increased disease occurrence of 13.0% compared to that of summer season 10.1% and South West monsoon 8.9%. During the study period of four years between 2015 and 2018, the highest mortality (19.4%) in poultry was recorded during the year 2015 and lowest (12.5%) during 2016. A total of 125 flocks with 68, 550 birds were affected with recorded death of 10, 645 birds during the study period. Out of this mortality 1922 (16.3%) was due to parasitic diseases, 2608 (29.9%) viral diseases, 5904 (14.3%) bacterial diseases, 77 (6.0%) fungal diseases and 134 (6.8%) were due to other factors like heat stroke. Of the bacterial diseases diagnosed, Ulcerative enteritis was of the highest percentage (14.6%) followed by Fowl chlorea (8.0%) and Infectious coryza (3.7%). Parasitic diseases included Coccidiosis (12.3%), tape worm infestation (10.1%), round worm infestation (14.4%) and mixed parasitic infection (16.3%). The most reported death due to viral diseases was Newcastle Disease (ND) (41.4%), Infectious Laryngotracheitis (ILT) (22.2%) and Fowl pox (6.9%). Aflatoxicosis was the only fungal entity noticed (6.0%).

Keywords: Post mortem, poultry diseases, ramanathapuram, retrospective study

1. Introduction
Poultry farming is one of the growing and prospective industries in Tamil Nadu, the southernmost part of India. The expansion of the poultry industry during the last two decades makes it the fastest growing and one of the most important industries in agriculture world. One of the major constraints in poultry farming is the outbreak of several devastating diseases causing economic loss (David-West, 1972) [3]. The increased demand of poultry meat and egg worldwide has led to intensive farming which has in turn, led to increased potential of disease occurrence. The viral infections account for the highest percentage of the mortality in chickens because of their contagious nature (Adeboyega, 1999) [2]. Several contributing factors *viz.* geographical location, climatic condition, breed, age groups of birds *etc.* are enhancing the occurrence of diseases in a particular locality. The presence or the absence of certain vital factors may act as the predisposing cause for certain disease conditions. The information on disease pattern in poultry are although available in some other parts of the country (Abdu *et al.*, 1985; Saidu *et al.*, 1994) [1, 8], the availability of such information pertaining to Ramanathapuram district, where the poultry keeping activities are steadily growing in the recent days is very meagre. Considering this information paucity, the present study was undertaken by analysing the data available at VUTRC, Ramanathapuram in order to throw some light in this aspect. This paper tries its level best to present the results of retrospective analysis of the data generated through post mortem examination of poultry carcases at VUTRC, Ramanathapuram during the period from January 2015 to December 2018. Although it requires still more studies, the authors opine that, the present information may throw a small

light on the type of disease pattern available in poultry sector of Ramanathapuram district.

2. Materials and Methods

2.1 Material for the study

This retrospective study was based on records of post mortem cases diagnosed at the Veterinary University Training and Research Centre (VUTRC), Ramanathapuram a constituent unit of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai, India. The data includes, the date of submission, type of birds, total number of birds in the farm, number of birds affected, number of birds subjected to post mortem, locality, farm details, previous and present history of disease condition and diagnosis based on gross pathology. The functional activities involved both extension and research work for the benefit of livestock farmers of Ramanathapuram district

2.2 Method of Study

A four year retrospective study was conducted from January 2015 to December 2018 using the records of post mortem examination at Veterinary University Training and Research Centre (VUTRC), Ramanathapuram. The diseases diagnosed were categorized based on the causative agent; bacterial, viral, protozoan, helminthiasis, fungal, co-infections and other miscellaneous factors.

2.2.1 Data analysis

The four year study data were statistically analysed using Microsoft excel (Windows version, 2010). The analysis was done on species and breed wise mortality pattern. Analysis was also made on age wise, season wise, month wise and year wise occurrence of diseases.

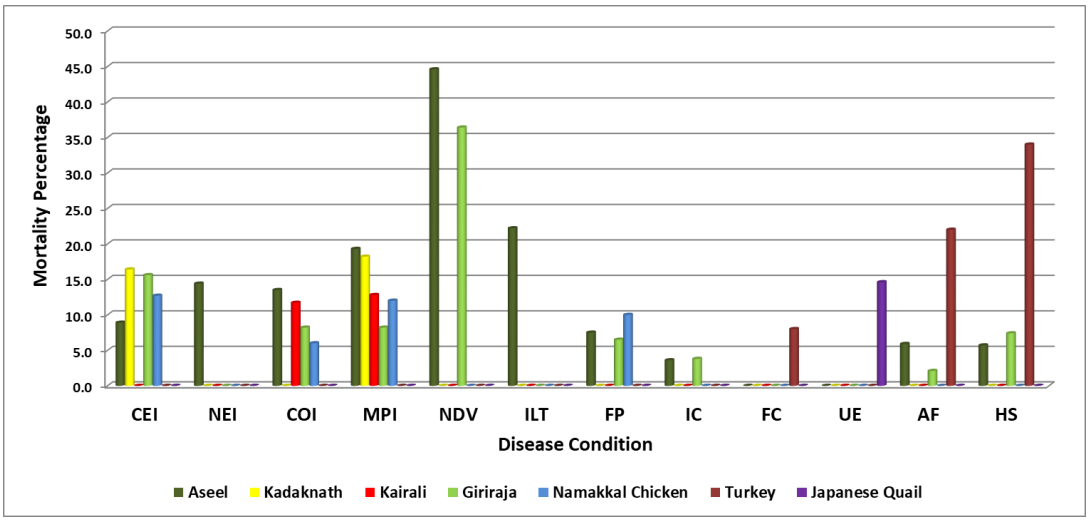
3. Results and Discussion

The study result showed an overall higher mortality in case of viral diseases (29.9%), followed with bacterial diseases (14.3%), parasitic diseases (12.6%) and fungal disease (6.0%). Among the viral diseases, highest mortality is observed in Newcastle disease (41.4%) followed with Infectious Laryngotracheitis (22.2%) and Fowl Pox (6.9%) as shown in Table 1. Ekou *et al.*, (2014) [4] stated viral disease especially Newcastle disease cause heavy mortality which opined to this present study. The mortality pattern varies from one chicken farm to another as the managemental practices varied within the district. FAO (2008) [5] stated that management practices varied from farm to farm under backyard leads to variation in mortality pattern. Least mortality found in case of Infectious Coryza (3.7%) in Aseel birds and Giriraja hybrid variety chicken. Mortality due to non-infectious causes like Heat stroke is 6.8%. The bacterial disease Ulcerative enteritis was found to toll higher lives (14.6%) in Japanese quail. The mixed infestation of nematode and cestode caused the higher loss of 16.3% in birds and least in mortality encountered in nematode infestation (10.1%). Aflatoxicosis was the only fungal entity found to cause production loss and with limited mortality in flock.

3.1 Species and breed wise analysis

Highest mortality was noticed in Giriraja population (18.2%) and least mortality in Namakkal Chicken (9.0%). Mortality due to cestodiasis was higher in Kadaknath (16.4%) and least in Aseel (8.9%). In the study period majority of the nematode infestation was found only in Aseel population (14.4%). Coccidial infection was higher in Aseel (13.5%) and least in Namakkal Chicken (6.0%).The concurrent infestation of tape worm and round worm was higher in Aseel (19.3%) and least in Giriraja (8.2%). The cases of mortality encountered in Kadaknath chicken during the study period were only due to nematodiasis and cestodiasis either as a single entity or in combination. Similarly Kairali chicken showed the highest incidences of coccidiosis and mixed helminthic infestations (Figure 1).

Newcastle disease was found mostly in Aseel (44.6%) and Giriraja (36.4%). The disease incidence and mortality due to ILT was noticed only in Aseel population (22.2%). The non descriptive country chicken was mostly resistant to major diseases. Fowl pox showed highest mortality in Namakkal Chicken (10%), followed with Aseel (7.5%) and Giriraja (6.5%). Infectious coryza was noticed in Aseel (3.6%) and Giriraja (3.8%). Similarly Fowl Chlorea (8%) incidences were noticed only in a Turkey unit. The mortality due to Ulcerative enteritis was seen in four units of Quail population (14.6%). The disease condition due to aflatoxin and heat stroke were noticed only in Aseel, Giriraja and Turkey Population.



CEI – Cestode Infection; NEI – Nematode Infection; COI – Coccidial Infection, MPI – Mixed Parasitic Infection; NDV – Newcastle Disease Virus; ILT – Infectious Laryngotracheitis; FP – Fowl Pox; IC – Infectious Coryza; FC – Fowl Chlorea; UE – Ulcerative Enteritis; AF – Aflatoxicosis; HS – Heat Stroke

Fig 1: Species and breed wise pattern of disease prevalence

3.2 Age wise analysis

Age wise analysis (Figure 2) showed a highest mortality in the 9 to 20 weeks age group (16.5%) and least mortality in the age group of 0-8 weeks (15.2%). The mortality due to viral infections (37.9%) and bacterial (14.4%) agents were highest in 0-8 weeks age group. Disease conditions due to parasites (14.0%) and fungal (7.0%) were highest in the grower (8-20 weeks) period. The younger age group of birds (7.2%) were found to be highly susceptible to heat stroke. The younger age group of birds (0-8 weeks) were highly affected with cestode infestation (14.5%), ILT (32%), Fowl pox (10%) and Ulcerative enteritis (14%). The grower birds (9-20 weeks) were highly susceptible to nematodiasis (16.6%), coccidiosis (13.5%), mixed parasitic infestations (8.2%), Infectious coryza (5%) and Fowl chlorea (8%). The Layer Period (>20 weeks) were found to be highly affected with Newcastle Disease (44.7%) condition which was in accordance with the study of Gulan *et al.*, (2015) [6].

Table 1: Mortality pattern in poultry

Disease	No.of flocks affected/ Incidence	No.of birds affected	No.of deaths	PM conducted	Mortality (%)
Tapeworm infection	30	4510	456	212	10.11
Roundworm infection	8	1860	268	112	14.41
Coccidiosis	18	6000	735	294	12.25
Mixed Parasitic infection	12	2850	463	185	16.25
Parasitic Diseases	68	15220	1922	803	12.63
NDV	15	4250	1760	775	41.41
ILT	5	3530	784	318	22.21
Fowl Pox	7	930	64	33	6.88
Viral Diseases	27	8710	2608	1126	29.94
Infectious Coryza	7	1250	46	22	3.68
Fowl Chlorea	1	100	8	8	8.00
Ulcerative Enteritis	4	40000	5850	680	14.63
Bacterial Diseases	12	41350	5904	710	14.28
Aflatoxicosis	8	1290	77	30	5.97
Heat Stroke	10	1980	134	53	6.77
Non-Infectious Diseases	18	3270	211	83	6.45
Grand Total	125	68550	10645	2722	15.53

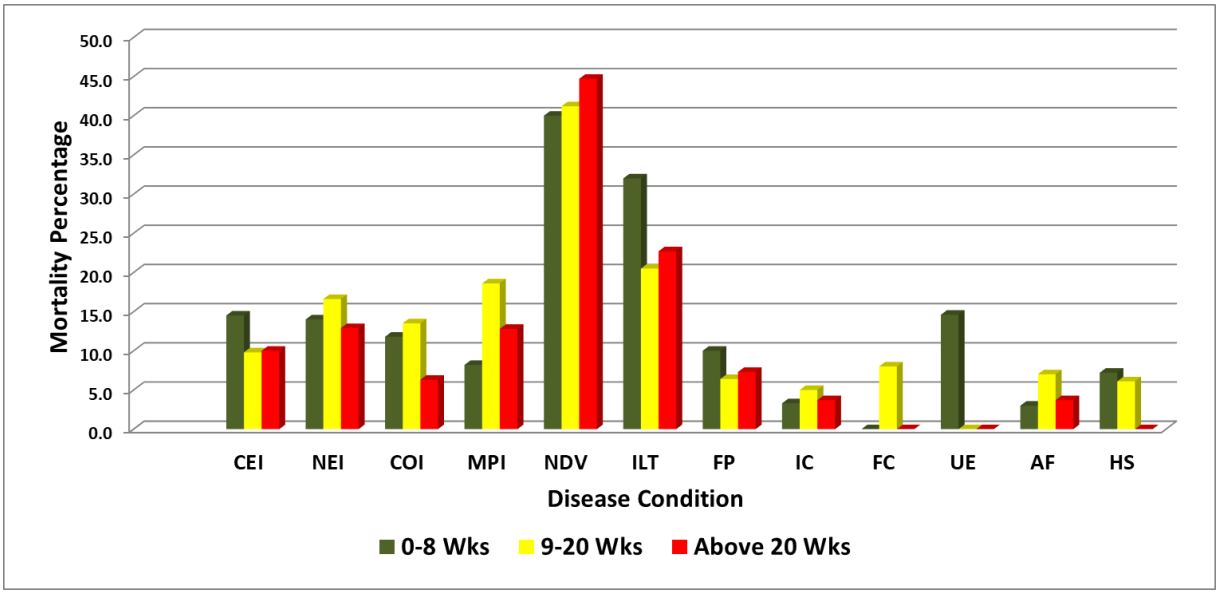


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Fig 2: Age wise pattern of disease prevalence

3.3 Month wise analysis

Month wise mortality (Figure 3) analysis showed highest mortality exists during the month of February (31.5%) and least mortality during July (6.0%). Mortality due to parasitic infection is seen throughout the year except April. Mortality due to viral diseases mostly exists during the month of January to June and October.

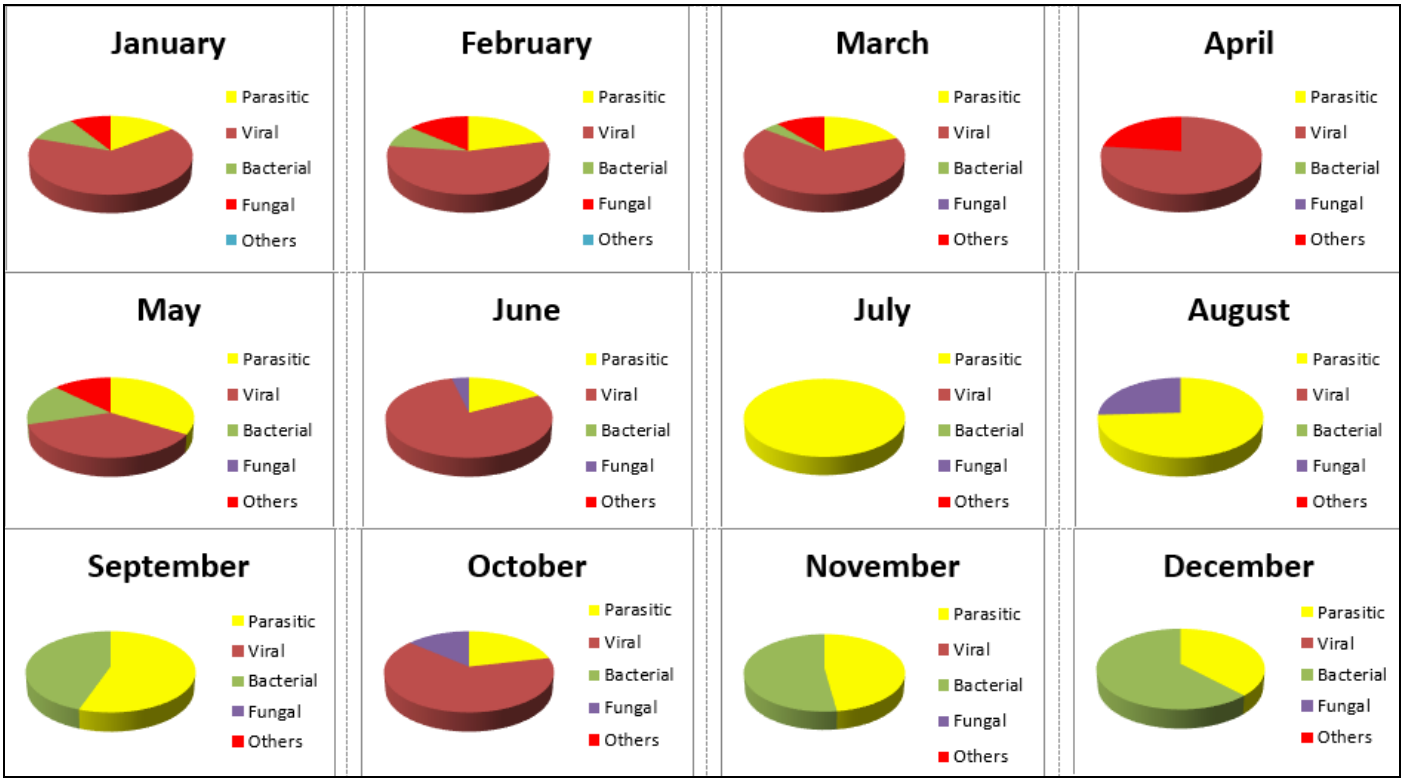

Fig 3: Season wise pattern of disease prevalence

3.4 Season wise analysis

Season was categorized into summer (Feb to May), SW Monsson (June to Sept) and NE Monsoon (Oct to Jan) and the season wise analysis (Figure 4) showed highest mortality in SW Monsoon period (17.2%) and least mortality in summer (14.1%). Ghulam *et al.*, (2015) [6] stated that the period during April to June appeared to be comparatively safer for broilers and layers (January to March). During summer highest mortality occurs due to heat stroke (6.8%) and parasitic disease conditions (15.3%). The NE monsoon period is owing heavy rainfall in this district showed highest mortality due to bacterial (16.4%) and fungal (7.4%) disease conditions. However the SW monsoon period, showed highest mortality in viral disease condition (44%). Most of the infectious disease condition like nematodiasis, coccidiosis, ILT, Fowl chlorea, Ulcerative enteritis, aflatoxicosis *etc.*, occurred in highest prevalence in NE Monsoon period. During the SW Monsoon period, Newcastle Disease, Fowl Pox and Infectious coryza holds highest incidences. The summer period showed highest mortality due to cestode infestation (16.3%) and Heat stroke condition (6.8%). The Newcastle disease condition did not show any seasonal specificity of occurrence. It showed almost equivalent higher mortality percentage in all the three seasons in Ramanthapuram District.

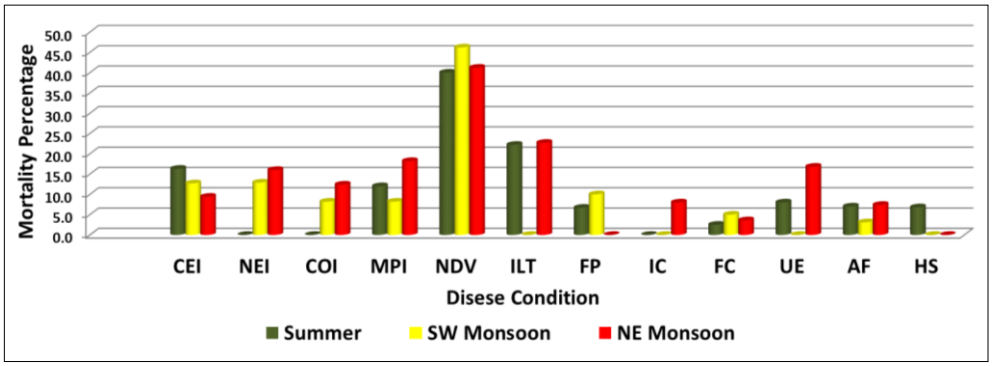

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Fig 4: Season wise pattern of disease prevalence

3.5 Year wise analysis

Year wise mortality pattern (Figure 5) stated that highest mortality was seen during 2015 (19.4%) and least mortality during 2016 (12.5%). Mortality due to parasitic, Viral, Bacterial, fungal and Heat stroke were higher during 2018 (14.0%), 2017 (34.0%), 2018 (14.4%), 2016 (7.9%) and 2018 (7.3%) respectively. The overall highest mortality percentage occurred during 2015 might be due to heaviest rainfall received during the year. The year 2018 recorded heavy mortality due to heat stroke condition (7.3%), might be attributed to hot and humid summer and the higher mortality due to aflatoxicosis in the same year might be due to heavy

rainfall during the winter which was in accordance with Galhotra, (1991) [7]. In this present study the year 2018 recorded very high temperature in summer later followed with heavy rainfall and the humid condition adjacent to coastal areas leads to diversified disease condition like heat stroke in summer and parasitic, bacterial and fungal infection during the rainy season.

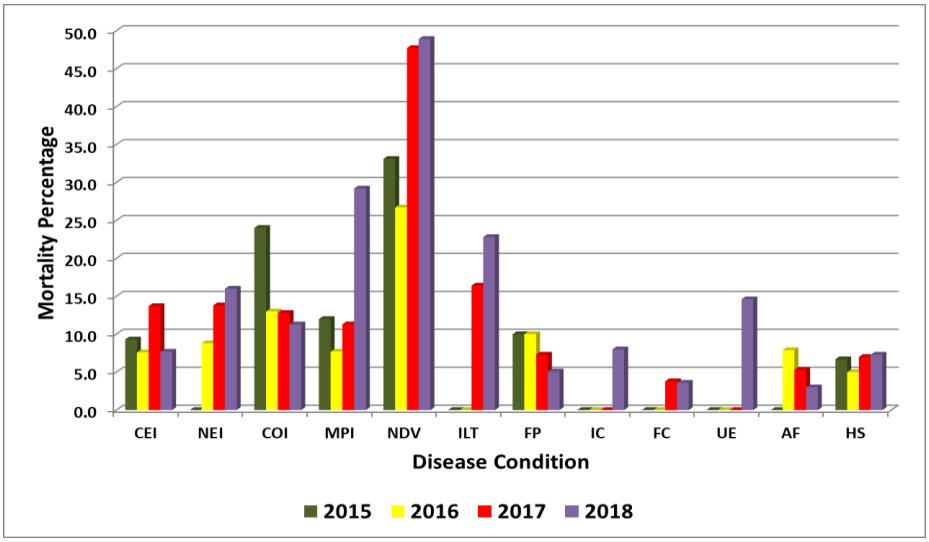

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Fig 5: Year wise pattern of disease prevalence

4. Conclusion

This study showed, Newcastle Disease (NDV), Infectious Laryngotracheitis (ILT) and mixed parasitic infection were the most frequently occurring poultry disease conditions in this part and causing heavy toll of lives and production loss. Poor management and biosecurity measures remain a major problem among the small scale farmers in this district. Therefore the diseases associated with inadequate management practices in poultry farms were such as coccidial and other parasitic and bacterial diseases. The improper housing management with poor ventilation and poor floor management were also found to be the major predisposing factors for majority of infectious and non-infectious conditions. Farms near by the coastal areas were mostly succumbed for heat stroke problems. Especially the young stocks were found to be affected. The Viral diseases like NDV were predominant due to failure to vaccinate or failure of vaccination by defective managements. The diseases like ILT were found to occur due to stocking of birds from other new sources where transportation stress favoured flaring up of diseases.

The data generated in this study could be useful for surveillance, monitoring and designing of appropriate interventions for disease control in this district and even the state of Tamil Nadu.

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