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Duck viral enteritis in chronically infected and partially immune duck flock of nomadic

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Abstract

Nomadic depends on livestock and poultry for their livelihood. Duck keeping is common among nomadics in delta districts of Tamil Nadu. This research was carried in a duck flock having a history of in appetite, polydipsia, star grazing and inconsistent mortality of about 8-10 birds in a day. The clinical samples were collected and subjected to bacteriological examination and molecular diagnosis. This flock showed positive for Duck viral enteritis and *E. coli* infections. This research found that the epidemiological risk factor for the inconsistent mortality was possibly due to chronically infected and partially immune birds in flock.

Keywords: Nomadic duck flock- duck viral enteritis – partial immunity

1. Introduction

Nomadic duck rising is a common livelihood activity of the rural poor in the Delta districts of Tamil Nadu. Any disease threat affects the livelihood of the rural folk. Duck virus enteritis (DVE) is though an acute, sometimes it is chronic in some ducks. DVE is caused by an atypical herpesvirus-1 or DVE virus (DEV) which is a member of the *Alphaherpesvirinae* subfamily of the *Herpesviridae* [2, 3,7]. Domestic and wild ducks, geese and swans of all ages are considered mostly susceptible, wherein the infection can exhibit chronicity or latency [3]. After establishing primary infection, DEV exhibits latent infection in trigeminal ganglia (TG). From this site, reactivation of the virus occurs and results in disease epidemic [5]. Till now reports confirmed that DVE survivors may become carriers for up to four years. Birds that recover from natural infection are suggested to be immune to re-infection, but latency (in the trigeminal ganglion) and reactivation of virus is recognized [7]. Clinical signs and gross pathology associated with a DVE outbreak vary with the species, immune status, age and sex of the affected birds, and with the virulence of the virus. Similarly, as infection progresses within a flock, more clinical signs are typically observed. In breeder ducks the range of signs include 'sudden deaths', photophobia associated with partially closed, pasted eye-lids, polydipsia, loss of appetite, ataxia, and nasal discharge. Birds often have ruffled feathers, watery diarrhoea and soiled vents. Sick birds may maintain an upright stance by using their wings for support [3]. The mortality will be primarily this research paper records an epidemic of DVE in a trans humane duck population with inconsistent and low mortality pattern. It gains importance due to its challenge to the productivity of the flock, besides its potential for disease spread all along its nomadic routes.

2. Materials and Methods

Epidemiological investigations were carried out from March 2017 to June 2017 at Mannargudi, Thanjavur district of Tamil Nadu in a trans humane flock with 1800 ducks. Study location was situated at an elevation of 23 meters from the sea level and having latitude and longitude of 11° 00' N and 78° 00' E respectively. The flock had ducks with the age of one year with mixed sex populations who were trans located from villages in Andhra Pradesh to Tamil Nadu. Postmortem examination was carried out and clinical materials were collected and screened as per the OIE protocol [1].

3. Results and Discussion

Many outbreaks are associated with the stress factors like extremes of weather and lean

feeding season on the susceptible birds. In domestic ducks the incubation period ranges from 3–7 days. Clinical signs includes ploy dyspsia, star grazing and vent pasting (Fig.1). Clinical samples were subjected to virological testing for diagnosis of Newcastle disease and Duck viral enteritis. Post mortem findings includes intestinal haemorrhage, peri hepatitis and pin point hemorrhages in the heart (Fig. 2, 3, 4 and 5). The results confirmed the presence of Duck viral enteritis by Polymerase chain reaction and absence of Newcastle disease. Bacteriological examination revealed presence of *E. coli* in the intestinal content.

Molecular diagnostic technique, PCR was selected for diagnostic assessment because in DEV infection, there is a usually poor humoral immune response, wherein antibodies are short lived. Hence, the diagnostic assays based on serology are of not much significance, as well as are of not useful in acute infection [9]. This epidemic samples were subjected to Polymerase chain reaction and found positive with higher sensitivity and specificity. Presently, both conventional and quantitative PCR have been employed for the detection of DEV [11]. Cloacal sample are found positive for the presence of DVE DNA and they indicated an active infection/ shedding of the virus [10].

This epidemic experienced a very low mortality rate (2.5%) though duck plague virus affects all age groups of ducks and characterized by high morbidity and mortality varying from 60-100% depending on the virulence of the infecting viral strain and the immunologic status of the birds [8]. This is due

to chronic infection nature with partial immune flocks [1]. Recovered birds may become latently infected carriers and may shed the virus in the faeces or on the surface of eggs over a period of years [7].

As this flock was not immunized for DVE and the infection may be picked up either by drinking or swimming in polluted water or through food. The virus enters susceptible birds through the mouth, nose, cloaca or breaks in the skin [7]. Migratory ducks are a major risk factor in the spread of this disease. DVE is usually spread by infected /recovered waterfowl that shed the virus in their droppings. Birds that recover from natural infection are suggested to be immune to re-infection, but latency (in the trigeminal ganglion) and reactivation of virus is recognized [7]. It survives in water and may persist in polluted, stagnant and slow moving pools, ponds and water bodies. In the absence of periodical screening of nomadic duck flocks and its water bodies, disease threats and spread is a possibility for the regions, where ever these nomadic duck flocks migrate.

This epidemic was observed during June 2017, 86% of outbreaks have been reported from March to June. The reason could be the spontaneous shedding of the virus from convalescent birds during the spring season and consequent epidemics possibly due to the stresses resulting from physiological changes in duration of daylight and onset of breeding that trigger virus release during spring season [6]. Upon antimicrobial therapy and vaccination for the flock, morbidity and mortality may come to zero [12].



Fig 1: Vent pasting in a duck



Fig 2: Intestinal haemorrhages in an affected duck



Fig 3: Perihepatitis in a duck



Fig 4: Pin point haemorrhages in Heart



Fig 5: Intestinal haemorrhage

4. Conclusion

This present study documents the epidemic of Duck viral enteritis in a trans humane duck population. Periodical shedding of virus by convalescent as well as clinically diseased birds pose threat to control the disease. Considering the fact that vaccines are generally effective only in DEV naive population and its shedding is still not completely understood, one can't completely rely upon vaccination alone. Therefore, elimination of the in-apparent carriers that represent a risk to domestic waterfowl is the prime goal in control this disease. Therefore, control measures like quarantine, reduction in virus contamination in the area using proper disinfectants, checking the dispersal of waterfowl, and monitoring for mortality in wild waterfowl populations should be observed. To minimize the disease challenges from migratory flocks, periodical screening programme of nomadic flocks and water bodies shall be established, as it will help to decrease the economic losses to these poor and marginalized nomadic people.

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