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Incidence of Newcastle disease in desi chicken and its control through ethno veterinary medicines

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Abstract

Newcastle disease (ND) is an endemic, highly contagious and fatal virus disease of poultry which causes significant economic losses in India. Despite Newcastle disease vaccination the farmers frequently faces disease outbreaks. This paper describes diagnosis and control of Newcastle disease in desi chicken. Twelve cases of Newcastle disease outbreak were recorded in desi chicken farms in Tirupur District, Tamil Nadu. The disease was confirmed by hemagglutination inhibition test using known positive serum and was identified as virulent Newcastle disease virus (NDV) by reverse transcriptase polymerase chain reaction for fusion protein cleavage site of the virus. The affected birds were treated with ethno veterinary herbal medicine recommended by the Ethno Veterinary Herbal Research Centre for Poultry, Namakkal. Birds affected with Newcastle disease were treated orally with a ground mixture of *Phyllanthus amarus*, *Cuminum cyminum* seeds and *Allium cepa* pulp along with jaggery thrice a day for five days. Along with the above the birds were given water containing *Cuminum cyminum*-10g/liter for five days. Following the herbal treatment, all the affected birds recovered completely from Newcastle disease within 3-5 days. These findings showed that the ethno veterinary practices play an important role in the control of economically important poultry diseases in country chicken.

Keywords: Newcastle disease, desi chicken, ethnoveterinary, control, treatment0074

1. Introduction

In animal husbandry and agriculture, Poultry sector is one of the most organized and well developed sectors. Poultry has been maintained in the rural backyard of the most houses since ages. Backyard desi chickens play a vital role in the livelihood strategies of many poor rural and urban households. Due to commercialization of desi fowl farming in developing countries like India, the incidence of infectious diseases like Newcastle disease and fowl pox is increasing. Newcastle disease is a highly contagious and highly fatal disease of domestic chickens and many other wild avian species. Affected birds show greenish diarrhea, respiratory distress and nervous signs, with mortality up to 100% (Alexander and Senne, 2008)^[1]. Many desi chicken flocks are affected by Newcastle diseases even after vaccination, as backyard chickens are maintained as multiage group flocks in free range system. Recently awareness and demand for organic farm products has been increasing. Ethno veterinary medicine is an indigenous knowledge and practice based on locally available bio resources to treat diseases effectively. This paper describes about the treatment of Newcastle disease in backyard chicken using ethno veterinary medicine.

2. Materials and Methods

Dead and Live ailing desi chickens were brought to Veterinary University Training and Research Centre, TANUVAS, Tirupur, Tamil Nadu for diagnosis and treatment. The details regarding history, age, flock size, number of birds infected and died, system of rearing were collected. The flock size varies from less than 10 birds to maximum of 200 numbers. The ailing birds were showing ruffled feathers, respiratory signs and greenish watery diarrhea. Postmortem examination of dead birds was carried out and specimens were collected for laboratory diagnosis. Specimens of Trachea and caecal tonsils were triturated and cleared by centrifugation and examined for Haemagglutination (HA) of 1% chicken erythrocytes. Further the hemagglutinating virus was identified as Newcastle disease virus by Haemagglutination inhibition test (HI) using ND antiserum. Reverse transcriptase polymerase chain reaction (RT-PCR) for fusion protein cleavage site (FPCS) gene region of NDV was carried out as per the protocol described by Seal *et al.* (1995)^[2]. Treatment for Newcastle disease (for 25 birds): *Phyllanthus amarus* - 100g of whole plant, *Cuminum cyminum*-25g of seeds and *Allium cepa* pulp-10 numbers were taken and ground along with jaggery in to a pasty consistency. The mixture was prepared freshly every day.

The preparation was mixed with feed and given orally to 25 numbers of affected and healthy birds thrice a day for 5 days. Along with the above, the birds were given boiled and chilled water containing *Cuminum cyminum*-10g/liter for five days. The recipe used for treatment of ND by Ahamad *et al.* (2016) [3] was followed with minor modifications.

3. Results and Discussion

Twelve cases were confirmed as Newcastle disease by Haemagglutination inhibition test and by RT-PCR for fusion protein gene of virulent NDV. The affected birds showed ruffled feathers and greenish diarrhoea. The morbidity and mortality were as high as 100% and 80% respectively. On postmortem examination petechial hemorrhages on the periventricular glands, button ulcers in the intestine and caecal tonsils were observed. Congestion of trachea and lungs were also observed in some birds. None of the flocks were vaccinated against Newcastle disease. Similar clinical signs and post-mortem lesions in the NDV infected birds were reported by Alexander and Senne (2008) [1]. The affected and healthy birds in the infected flocks were treated with ethnoveterinary herbal medicine orally thrice daily for 5 days. The birds showed significant signs of recovery from the second day of treatment. The greenish diarrhoea was stopped and water and feed intake returned to normal within 3 days of treatment. Patel *et al.* (2011) [4] reported that *P. amarus* showed a wide spectrum of pharmacological activities including antiviral, antibacterial and anti-inflammatory properties. Cumin and its active constituents used as antibacterial, antifungal, anti-inflammatory, antioxidant and immune modulation (Kaur and Sharma, 2012; Singh *et al.*, 2017) [5, 6]. *Allium cepa* is having many therapeutic properties like anti-inflammatory, antiseptic, antispasmodic and diuretic activity (Kumar *et al.*, 2010) [7]. Jaggery contains many micronutrients, which has anti-carcinogenic and antitoxic activity (Shrivastava *et al.*, 2016) [8]. Ahamad *et al.* (2016) [3] successfully treated Newcastle disease infected desi chicken following similar recipe with certain modifications. Ethno veterinary medicine is a natural and economical method to treat many diseases under field conditions (Sribalaji and Vikramachakravarthi, 2010; Sakthi Priya and Gopala Krishna Murthy, 2017) [9, 10]. Many research papers on ethno veterinary medicine has been published and herbal therapies are not been considered unethical (Punniamurthy, 2005) [11]. Traditional knowledge about herbal medicines helped to control high incidence of Newcastle disease. Formal scientific research, validation, standardization and popularization of this medicine are necessary for further development, commercialization and field application. The farmers should be educated on importance of prophylactic vaccination to safe guard birds from infectious diseases.

4. Conclusion

Desi chickens infected with Newcastle disease were treated successfully using ethnoveterinary herbal medicine. The freshly prepared mixture of *Phyllanthus amarus*, *Cuminum cyminum* seeds and *Allium cepa* ground along with jaggery was effective against Newcastle disease when administered thrice daily orally for 5 days. These results showed that the ethnoveterinary medicines play an important role in treatment of Newcastle disease. Further it is emphasized that backyard chicken should also be vaccinated against Newcastle disease regularly for prevention of the disease.

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