Original Research

Incidence of Fowl Cholera in Desi Fowl Farms of Tirupur District

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Abstract

Desi birds are often susceptible to fowl cholera, a serious, highly contagious disease caused by the bacterium, Pasteurella multocida. This study involves the diagnosis of fowl cholera by gross necropsy examination, isolation and identification of organism by culture and biochemical method. During the span of 8 months (from January 2017 to August 2017) six different flocks of adult desi chicken (with an average flock size of 70 birds per flock) were subjected to necropsy examination and a total of 30 carcasses were examined for diagnosis of the disease. Fowl cholera was confirmed in all six flocks by gross and microscopic examination and bacterial isolation by culture method and biochemical method. The women self help groups were advised to follow strict biosecurity and ethno veterinary practices for prevention and control of diseases.

Key words: Confirmation, Fowl Cholera, Microscopic Examination, Necropsy, Treatment

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Introduction

Tirupur district has many women self-groups sponsored by the state government. Among the various programmes offered to the women self-help groups, backyard desi fowl farming is one of the major revenue generating avenue. Small flock of around 40 to 100 desi birds is normally reared in the backyard. The major disease outbreaks among these birds are Ranikhet disease, fowl cholera and fowl pox.

Pasteurella multocida, a gram-negative bacterium, is the causative agent of fowl cholera in birds. Among avian strains of *P. multocida*, serogroup A strains cause the majority of fowl cholera. This organism being an opportunistic pathogen is also a common commensal in the upper respiratory tract of birds. The infection leads to acute septicaemia to chronic and localised infections and the morbidity and mortality might be up to 100 per cent as the pathogen resists phagocytosis after invading the internal tissues and multiply very

quickly. The route of infection is oral or nasal with transmission via nasal exudate, faeces, contaminated soil, equipment, and people. The incubation period is usually 5-8 days. (Paul Mcmullin 2004).

Fowl cholera does not have any zoonotic implication when exposed by the oral or subcutaneous routes. Generally clinical signs of fowl cholera may be similar to salmonellosis, colibacillosis and listeriosis in poultry. Differentiation is based on isolation and identification, as *P. multocida* can be readily cultured from cases of fowl cholera. Since the routine nature of isolation and identification of *P. multocida* by culture method and biochemical tests have been used widely without dubious results, confirmation of the results is acceptable (OIE, 2012). Identification of *P. multocida* is based on the results of biochemical tests, which include carbohydrate fermentation, enzyme production, and selected metabolite production.

Materials and Methods

A total of 30 carcasses from six different backyard poultry farms from various areas of Tirupur district were examined. Few live ailing birds (brought along with the carcass) exhibited the signs of dullness, off feed, paleness in comb along with whitish diarrhoea. Heart blood smears, aspirates of heart blood and impression smears of spleen, liver and lung were collected from dead desi fowls and stained with Leishman stain (Akhtar. 2013). The heart blood was also inoculated in Brain Heart Infusion (BHI) broth and incubated at 37^0C overnight and the broth culture was streaked onto blood agar and MacConkey agar. The colonies suggestive of *P. multocida* were subjected to biochemical tests for identification. The biochemical tests included IMVIC, sugar fermentation test and catalase and oxidase test.

Antibiotic sensitive assay was performed for the *P.multocida* isolates as per the disc diffusion method of Kirby-Bauer (Bauer *et al.,* 1966).

Results and Discussion

The commonly observed external signs in the live birds were anorexia, ruffled feathers, oral and nasal mucus discharge, cyanosis and white diarrhoea.

On post-mortem the lesions observed were general septicaemia like vascular disturbances, showing general passive hyperemic congestion throughout the carcass. Petechial and ecchymotic haemorrhages were seen in the abdominal region and haemorrhages were found in the intestinal mucosae (Fig. 1a) and on subserosal surfaces in the thoracic and abdominal cavities. The liver and spleen were swollen with typical multiple small focal areas of coagulative necrosis (Fig. 2a and 2 b). Severe congestion and haemorrhages were noticed on the heart and lungs (Fig. 3a and 3b). These observations were similar as reported by Srinivasan *et al*. (2011) and Aravinth *et al*. (2016) in broiler chicks.

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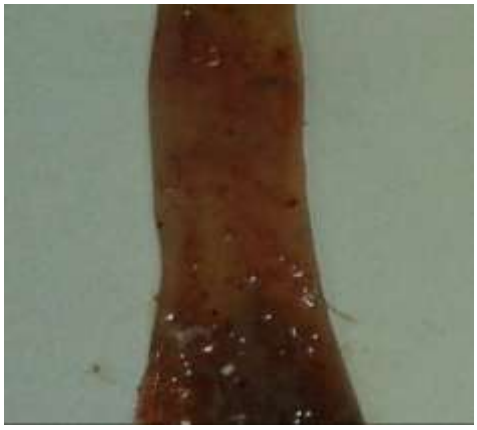


Fig .1a: Haemorrhages in intestinal mucosae

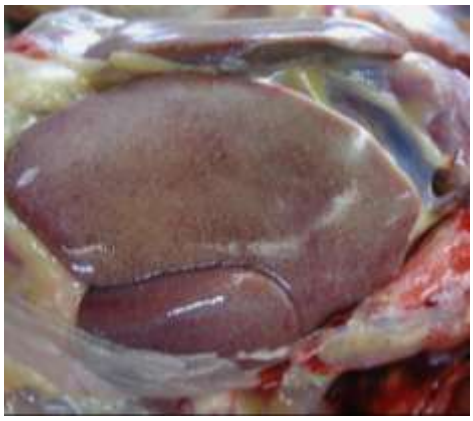
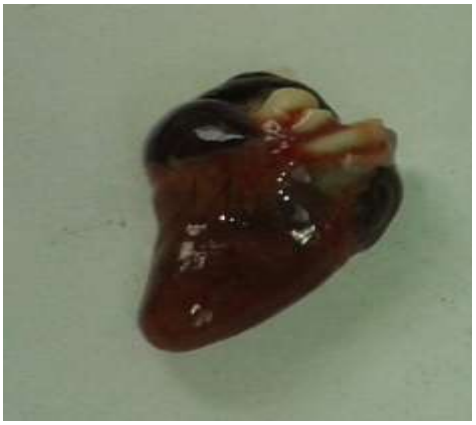


Fig. 2a and 2b: Liver showing typical multiple small focal areas of coagulative necrosis



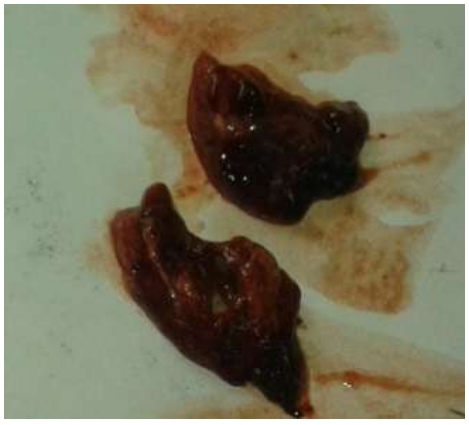


Fig. 3a and 3b: Heart and lungs showing haemorrhages and congestion

Heart blood smear, liver and spleen impression smears showed characteristic bipolar organisms on Leishman staining (Fig. 4) and Gram negative coccobacilli by Gram's staining method were in accordance with Ievy *et al.* (2013) and Akhtar *et al.* (2013). The isolates showed typical cultural characteristics of dew drop, mucoid, non haemolytic colonies in blood agar (Fig. 5). No growth was observed in MacConkey agar.

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Gram's staining of the smears revealed characteristic gram- negative coccobacillary organisms. The isolates were positive for indole, nitrate reduction, oxidase and catalase and negative for methyl red and Voges–Proskauer tests. The carbohydrates fermented were glucose, mannose, galactose, fructose, sucrose and manitol and the carbohydrates that were not fermented included rhamnose, cellobiose, raffinose, inulin, erythritol, adonitol, m-inositol, and salicin. These results were same as reported in OIE (2012) and Panna *et al.* (2015)

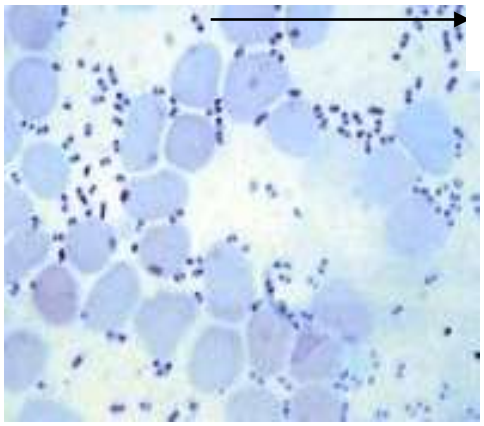

Fig. 4 : Leishman staining

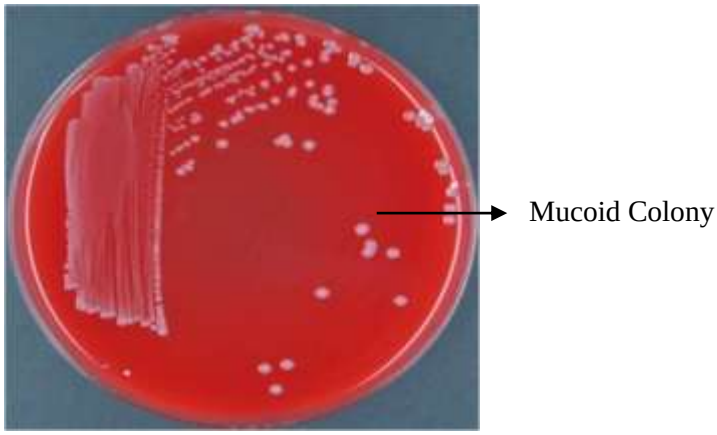

Fig. 5: Dew drop, mucoid, non haemolytic colonies in blood agar

Antibiotic sensitivity test revealed that the isolate was sensitive to Gentamicin, Amikacin Doxycycline, Ceftriaxone and Chlortetracycline. Resistance was observed to antibiotics such as Co-trimoxazole, Ciprofloxacin, Enrofloxacin and Furozolidone. Similar sensitivity pattern was observed by Aravinth *et al.* (2016). Water sample collected from the farm premises, tested for coliforms revealed $7x10^{2}$ CFU/mL. The ideal coliform count should be 0 cfu/ml and a level above this indicates contamination which might also add to the complexity of the disease and multiple bacterial infection generally reduces the immune system.

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As per the antibiotic sensitivity test results the flock with high mortality was treated with Gentamicin and the recovery was observed after 5 days. The aminoglycosides remain in the digestive tract so are effective in the treatment of enteric infections. The bacterium is easily destroyed by environmental factors and disinfectants, but may persist for prolonged periods in soil. This could probably be due to poor disinfection procedure or improper hygienic measures followed for disinfecting the farms. Reservoirs of infection might be present in other species such as rodents, cats, and possibly pigs. This was confirmed by the statistical study reported by Tahir *et al*. (2003) which says that farms where previous outbreaks of fowl cholera favored the onset in commencing flocks. Predisposing factors include high density and concurrent infections such as respiratory viruses. Hence the women self-help groups were advised to follow strict biosecurity and ethnoveterinary practices for prevention and control of diseases.

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