

Studies on Natural Outbreaks of Infectious Bursal Disease (Gumboro) in Chickens

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ABSTRACT

A study on natural outbreaks of infectious bursal disease complicated with or without New Castle disease in 11 broiler farms around Bombay was undertaken in respect of clinical signs, morbidity, mortality and gross lesions. Serological diagnosis of infectious bursal disease has been discussed.

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INTRODUCTION

Infectious bursal disease (Gumboro) was first reported by Cosgrove (1962) from Gumboro town of U.S.A. In the initial stage the disease was described as "avian nephrosis" or "nephritis nephrosis syndrome". It was Hitchner (1970) who had noted pathognomic changes in the bursa of Fabricius (BF) of the affected birds and named the disease as "infectious bursal disease (IBD)". Since the initial report by Cosgrove, IBD has been diagnosed in many areas of the world. In India it was first reported by Mohanty *et al.* in 1971. Infection at an early age with infectious bursal disease virus (IBDV) has been found to render the bird more susceptible to other common poultry diseases like Marek's disease (Cho, 1970), Salmonella and E. coli. infections (Wyeth, 1975), Mycoplasmosis, New Castle disease (ND) and infectious bronchitis (Giambrone *et al.* 1977). Recently from the state of Maharashtra, there were increasing reports on

failure of ND vaccination particularly in broiler chickens due to immunosuppressive effect of IBD (Ajinkya *et al.* 1980).

MATERIALS AND METHODS

Eleven commercial broiler farms varied in sizes from 5,000 to 50,000 birds, situated far from each other around Bombay were studied for outbreaks of the disease. All the birds were vaccinated with Lasota or F₁ or CDF₆₆ vaccine upto 5th day of age.

Frequent visits were made to the farms and clinical symptoms, morbidity and mortality were recorded. Detailed postmortem examinations of 91 birds were carried out and gross lesions were recorded. Pieces of BF and spleen were collected aseptically for detection of IBDV by agar gel precipitation test (AGPT) and New Castle disease virus by haemagglutination inhibition (HI) test respectively. Serum samples from 163 recovered birds from all the farms were collected at the time of slaughter, for

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detecting precipitating antibodies by AGPT.

Monospecific IBD antigen for AGPT and for production of antisera in rabbits was obtained from the Intervet International B.V. Holland. Antiserum against IBD antigen in rabbits was raised as per the standard methods using complete Freund's adjuvant. Serum samples and 10% bursal suspension in broth from each bird were subjected to AGPT (Jayaramaiah and Mallick 1975) for detection of serum antibodies and viral antigen respectively.

RESULTS AND DISCUSSION

Three to six weeks age broiler chicks were commonly found affected in all the farms. No outbreaks were recorded in the layer flocks during the study. The problem of IBD was found more important to the broiler industry, than to any other segments of the poultry industry (Winterfield 1977). The onset of the disease was rapid. Common symptoms observed in all the affected farms comprised ruffled feathers, dullness, whitish diarrhoea, anorexia, trembling, severe prostration and death. However, greenish diarrhoea and torticollis were also observed in five farms in which IBD was complicated with New Castle disease. Ajinkya *et al.* (1980) observed similar symptoms of IBD in ND uncomplicated and complicated birds. The course of the disease was on an average 3-7 days terminating in death or recovery.

Morbidity rate varied from 30%-80% with an average of 62%. The average mortality observed in uncomplicated flocks was 13.3% while it increased to 27.5% in those flocks superinfected with ND. Mortality pattern in both the cases characterized by

reaching peak halfway through the disease period. Mortality pattern in IBD was considered to be of diagnostic importance by Parkhurst (1964), Bygrave and Faragher (1970). The overall mortality in outbreaks of IBD as noticed by Cosgrove (1962), Fraser (1964) and Parkhurst (1964) was within the range of 1-15%, the average mortality being 5-6%. However, Bygrave and Faragher (1970) recorded 36% mortality during 29th to 34th days of age.

The necropsy observations were characteristic of IBD. The pathognomic lesions were seen in BF. The gross lesions in BF observed during present study were in agreement to the observations made by Hirai *et al.* (1973) and Ojo *et al.* (1973). Birds died with short illness of 3-4 days showed great enlargement of BF with edema, while birds with longer duration of illness on the contrary showed atrophy of BF with thinning of wall. In severe cases petechial and ecchymotic haemorrhages on mucosa were also noticed. The presence of cheesy necrotic mass in the bursal lumen has been described by many workers (Mohanty *et al.* 1971, Hirai *et al.* 1973). However, in the present study this was found in only few cases. Muscular haemorrhages observed in natural outbreaks of IBD were not a constant feature as observed by Mohanty *et al.* (1971). In ND complicated birds lesions like haemorrhages in proventriculus, caecal tonsils and small intestine with ulcerations were also observed. Similar observations were also made by the Ajinkya *et al.* (1980). However, haemorrhages in proventricular and intestinal mucosa were also observed in uncomplicated IBD outbreaks (Fraser 1964, Ojo *et al.* 1973 and Onunkwo 1975).

Serum samples were collected at about 8th week of age, i.e. 2-5 weeks after the onset of the disease. These were put for AGPT for detection of IBD precipitating antibodies. All the sera samples failed to produce the precipitating line within 24 hours with known antigen. Ajinkya *et al.* (1980) during similar study got only 3 weakly positive reactions out of 60 sera samples tested by AGPT. Presence of serum precipitin was reported to be inversely proportional to the severity of the disease by Faragher (1972). Out of 91 bursal suspensions put for AGPT to detect IBD antigen, 87 showed positive reactions. As reported by Ajinkya *et al.* (1980), the bursal suspensions were found more reliable as the precipitating antigen is organ specific and detectable only in the BF.

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