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# COMPARISON OF AGAL GEL PRECIPITATION TEST (AGPT) AND ENZYME LINKED IMMUNOSORBENT ASSAY (ELISA) IN THE DETECTION OF INFECTIOUS BURSAL DISEASE VIRUS (IBDV) ANTIBODY IN VILLAGE CHICKENS IN OYO STATE, NIGERIA

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## SUMMARY

**The use of agar gel precipitation test (AGPT) and enzyme linked immunosorbent assay (ELISA) in assaying for the presence of infectious bursal disease (IBD) virus antibody in village chickens in Oyo State, Nigeria, was compared. Out of 400 sera subjected to ELISA, 360 (90%) samples where positive for IBD virus (Serotype 1) antibody with a titre range of 3,441 to 22,444 whereas, by the AGPT, out of 392 sera tested, 248 (63.3%) samples were positive with a titre range of $0\log_2$ (neat) to $4\log_2$. This study has correctly presented the seroprevalence of IBD in village chickens in this environment and has further confirmed the superior sensitivity of the ELISA technique.**

## INTRODUCTION

Infectious bursal disease (IBD) is a highly contagious viral disease of chickens. It is endemic in Nigeria (Ojo *et al.*, 1973; Onunkwo, 1975; Abdu *et al.*, 2001). It is of high economic importance in Nigeria as it results in tremendous loss to poultry farmers in terms of mortality and immunosuppression.

The indigenous or village chickens, which have a population of over 123 million, constitute the bulk (92%) of chickens reared in Nigeria (Akinwunmi *et al.*, 1979). They are reared extensively by rural peri-urban dwellers. It is generally believed that the indigenous chicken is less susceptible to infections than the exotic breeds (Okpe, 2001, Mdegela *et al.*, 2002). However, cases of IBD outbreaks in indigenous chickens have been reported (Abdu and George, 1986; Okoye, 1987; Abdu, 1988).

Studies have been carried out on the survey of IBD virus antibody in indigenous chickens in Nigeria (Umoh *et al.*, 1982; Adene *et al*; 1985, Abdu *et al.* 1985; Kembi and Onifade, 1995); Oladele, 2001), but these studies have used agar gel precipitation test (AGPT) and counterimmuno-electrophoresis (CIEOP) technique. These immunodiffusion techniques are known to detect precipitating antibodies, which must be at high concentrations. A more sensitive enzyme immunoassay technique, (ELISA), was therefore considered to give a true reflection of the seroprevalence of IBD virus antibody in Nigerian indigenous chickens.

## MATERIALS AND METHODS

Four hundred indigenous chickens comprising of hens, cocks and growers, reared extensively in villages within Ibadan metropolis; Apata, Odo Ona and Omi Adio in Oyo State, with no record of previous vaccination, were bled via the jugular vein into plain universal bottles. Sera were harvested and stored at $-20^{O}C$ until analysed.

### Agar Gel precipitation Test (AGPT)

Test sera were subjected to AGTP as described by Cullen and Wyeth (1975) using known positive serum from hyperimmunized chicken as control. The IBD antigen used was the supernate of a 50% suspension (W/V) of infected bursae-Serotype 1, which had earlier tested positive for IBD virus antigen.

Enzyme Linked Immunosorbent Assay

The test sera were subjected to indirect-ELISA for the detection of IBD virus antibody as described by Owoade and Aboujaoude (2001).

## RESULTS

Out of 400 sera tested by ELISA, 360 were positive for IBD virus antibody with a titre range of 3,441 to 22,444. As for the AGPT, out of 392 sera tested, 248 were positive with a titre range of 0 log2 (Table I).

**TABLE I: Comparison of AGPT and ELISA in the detection of IBDV antibody in village chickens in Oyo State**

| Test | No. (%) positive | No. (%) negative | Total |
|---|---|---|---|
| AGPT | 248 (63.3) | 144 (36.7) | (392) |
| ELISA | 360 (90) | 40 (10) | 400 |

## DISCUSSION

This study has shown higher number of IBD virus antibody positive sera by ELISA than by AGPT in the same set of samples. It has further confirmed the superior sensitivity of ELISA over AGPT (Marquardt *et al.,* 180). It could also be deduced from this study that the endemicity of IBD in this environment is more than has been hitherto presumed. The antibody response obtained could only be due to field infections, as the chickens were not vaccinated.

Earlier reports have shown infection rates of 68% and 52% (Adene *et al.*, 1985; Kembi and Onifade, 1995), lower than the 90% obtained in this study. This may be associated with the serological techniques employed. In the study by Marquardt *et al.* (1980), IBD virus antibody response to experimental infection was measured by viral neutralization test (VNT), ELISA and AGPT. VNT and ELISA detected higher rates of IBD virus antibody and there was earlier detection of the antibody than with AGPT. Therefore for a true picture of the prevalence of IBD virus antibody in a flock or in an environment, the ELISA technique is recommended. It was also observed in this study that while some samples were positive for both tests, some samples that were weakly positive or even negative by AGPT, were strongly positive by ELISA. This could indicate that low level antibody cannot be detected by AGPT. This explains the differences in results, thus making ELISA more sensitive.

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