RESEARCH ON THE PRESENCE OF ANTI INFECTIOUS BRONCHITIS VIRUS ANTIBODIES IN BROILER REARED IN SOUTH-WESTERN PART OF ROMANIA – PRELIMINARY STUDY

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Abstract

Avian infectious bronchitis (AIB) is one of the most important contagious, respiratory, acute diseases with a very high economic impact, caused by the infectious bronchitis virus (IBV) one of the most widespread coronaviruses in the world belonging to the genus *Gammacoronavirus*. The clinical evolution is characterised by the presence of respiratory, reproductive and renal disorders. The aim of the study was to show the presence of IBV antibodies in vaccinated broiler chickens and to determine the post-vaccinal origin or following infection with circulating wild strains. Ninety-six serum samples from broiler, Ross 308, aged between 38 and 42 days, reared on five farms from five counties located in south-western Romania were studied. Analysis of the serum samples for antibodies was carried out by ELISA, staggered, at the Synevovet Romania laboratory. Anti-IBV antibodies were identified in all farms studied. The absence of IBV antibodies was observed in 12.5% of the samples examined. Anti-IBV antibodies were detected in 87.5% of the sera studied. Very high values of antibody titters, above those indicated by the vaccine efficacy evaluation guidelines, were recorded in 2/3 of the sera studied, suggesting a possible infection with wild strains. The results of the present study indicate the need to extend the evaluation of IBV antibody titters for a clearer picture of the evolution of the infection, but also molecular studies to differentiate vaccine strains from wild strains.

Key words: (antibodies, prevalence, infectious bronchitis virus, broiler)

Avian infectious bronchitis (AIB) is one of the most important acute respiratory diseases affecting chickens, being highly contagious and having a dramatic economic impact due to mortality, productive performance, decreased egg production and quality, and costs incurred for control and control [Moga-Mânzat R., 2005; Andreopoulou M., 2019; Tudor V., 2018; Tegegne D., 2020].

The disease is caused by infectious bronchitis virus (IBV) one of the oldest and most widespread coronaviruses in the world belonging to the family *Coronaviridae*, genus *Gammacoronavirus*, species *Avian* coronavirus [Lisowska A., 2021; Fischer S., 2020; Tegegne D., 2020].

The clinical course is characterized by the presence of respiratory, reproductive and renal signs [Moga-Mânzat R., 2005; Tudor V., 2018; Lisowska A. et al., 2021; Jackwood M.W., 2013].

IBV is widespread worldwide and several serotypes exist [Jackwood M.W., 2013]. The capacity for antigenic variation through mutations or recombination events that allow adaptation to changes under selection pressure drives the process of rapid molecular evolution [Kusters et al., 1990]. In such situations, due to variability, a lack of protection can occur in applied vaccine protocols. These aspects make it necessary to optimise control programmes and improve epidemiological knowledge of this pathogen.

The aim of the study was to detect the presence of IBV antibodies in vaccinated broiler chickens and to determine the post-vaccine origin or infections with circulating wild strains.

MATERIAL AND METHOD

A total of 96 blood samples were collected from broiler chickens reared on five farms/farms in five counties located in south-western Romania (Fig. 1).

The chickens, Ross 308, tested ranged in age from 39 to 42 days.

From each farm/farm 18/20 samples were taken. All selected broiler farms had a history of respiratory problems and were vaccinated against the studied pathogens.

During sample collection, data were recorded on the birds studied and the technologies used in the premises from which they originated.

Approximately 1-2 ml of blood was collected from the wing vein of randomly selected birds using a disposable syringe. The syringe containing the blood was held upright for clot formation and the serum was collected by the decanting method as described by Barberis A., et al., 2018. Subsequently, the collected serum was transferred to an Eppendorf tube and transported to the laboratory keeping the chain cold and subjected to centrifugation at 3,000 rpm for 5 min. Serum samples were stored at -20°C until the assay was performed.

Analysis of serum samples for antibody detection was performed by ELISA tests in the Synevovet Romania laboratory.

Data analysis was performed by GraphPad, QuickCalcs and Office Excel 2016.

Figure 1 **Farms, chickens, and samples from the studied area**

RESULTS AND DISCUSSIONS

Anti-IBV antibodies were identified in all farms studied.

The minimum titers recorded on positive samples ranged from 8 to 3427 and the maximum ranged from 1267 to 18567, with averages ranging from 465 to 10577.

The absence of IBV antibodies was observed in 12.5% of the samples examined.

Anti-IBV antibodies were detected in 87.5% of the sera studied.

Correlating the data obtained with the information from the Biochek "Interpretation and Application of Results Manual" it was observed that values above 4000 of antibody titers suggest "suspect titer infection" with a wild virus is possible.

Very high values of antibody titters, above those indicated by the vaccine efficacy evaluation guidelines, were recorded in 66.67% of the sera studied, suggesting a possible infection with wild strains.

Since few serology and molecular biology studies have been carried out in Romania, the present study is justified [Franzo G., 2017; Tudor V., 2018].

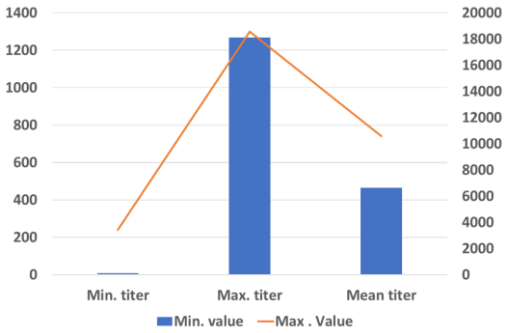

Figure 2 **Anti-IBV antibodies titers value recorded in studied samples**

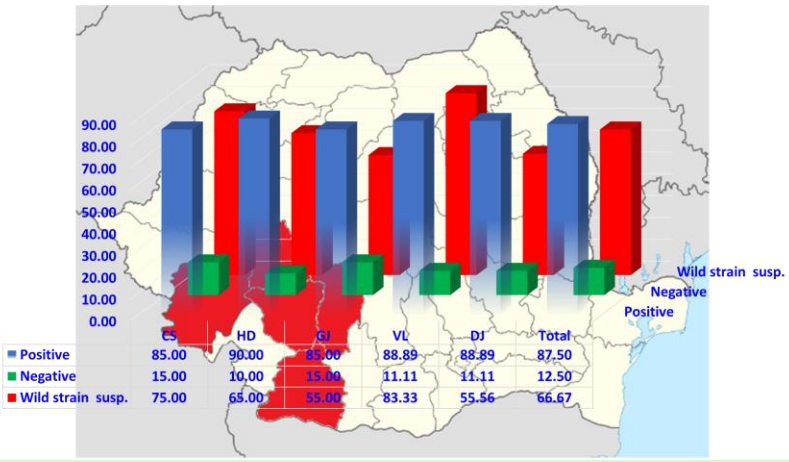

Figure 3 **Percentage representation of the results obtained for the determination of anti-IBV titers in the studied farms**

A study conducted on 184 blood samples from different broilers from chicken farms showed a high rate of IBV infection with high antibody titers. A high seroprevalence was demonstrated in 78.25% of the samples examined with a significant mean antibody titer [Barberis A., 2018].

Barua H. et al., 2006, determined the seroprevalence of infectious bronchitis virus (IBV) in chickens reared in both intensive and semi-intensive systems. The results showed that in the semi-intensive system the seroprevalence was 98% which is significantly higher than in the intensive system, 54% [Barua H., 2006]

A cross-sectional study was conducted in two commercial farms and four small poultry farms that had no history of chicken vaccination against IBV. The results show that the overall prevalence of bronchitis virus was reported to be 97.46% in the selected flocks [Shiferaw J., 2022].

The seroprevalence of infectious bronchitis virus (IBV) of 94% was established in 158 scavenging and 42 small and medium-scale intensive chicken holdings in the East, West and North Shewa Zones of central Ethiopia [Habte T., 2022].

CONCLUSIONS

The ELISA test performed on broiler serum samples, from the five farms studied in the southwestern part of Romania, revealed a substantial level of antibodies against IBV in 87.5% of them.

Antibody titers were extremely high in two-thirds of the sera tested, indicating a probable infection with wild strains.

The results of the present study indicate the need to extend the evaluation of IBV antibody titers for a clearer picture of the evolution of the infection, but also molecular studies to differentiate vaccine strains from wild strains.

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