A Comparative Study of Immunization of 5 Various Commercial Infectious Bronchitis Live Vaccines in Broiler Chickens

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ABSTRACT

Infectious Bronchitis (IB) is one of the important diseases of poultry industry in Iran and the entire world, not only due to the serious and high flock mortality, but also through the economic impacts. The purpose of this study was to evaluate the humoral antibody response of broiler chickens to various live IB vaccines with same virus strains. Studied vaccines including: Newcastle disease-Infectious bronchitis bivalent vaccines: (BRONHOPEST B1 SPF, BRONHOPEST Lasota SPF and HIPRAVIAR- CLON/H120) and monovalent vaccines: (Bronhikal H120, Veterina and H120, Razi). Tow hundred and forty, 7-day-old ROSS 308 broiler chickens divided randomly into 6 groups, 5 experimental and a group as control one. Each groups of experiment, vaccinated by a different live IB vaccine via eye drop at 8 days of age at the same time and the control group received no IB vaccine. The antibody response to vaccination was assessed using the ELISA test by taking blood samples three times, first the day before and the next, 7&14 days post vaccination Results indicated that difference between the mean antibody titers of all groups were significant at the 0.05 level (P<0.05), at 7 and 14 days post vaccination in comparison with control group. And in multiple comparisons, there were difference between the mean antibody titers of some of the groups either. The group that has been vaccinated by HIPRAVIAR- CLON/H120 showed the highest level of antibody titer and in opposite the vaccine by H120, Razi obtained the lowest level of antibody titer. On the other hand, differences of the mean antibody titers of some groups were significant at 7 days post vaccination too. In conclusion, to be informed from the potency of different vaccines is necessary for vaccination strategies and subsequent to produce an adequate immune response.

Key words: IB vaccines, ELISA, broiler chickens, humoral immunity.

Introduction

Infectious bronchitis virus (IBV) is a major cause of economic losses in the poultry and can be involved in respiratory disease, nephritis, and poor egg production and quality. However, these sings are not specific to IBV. Therefore, diagnostic tools are needed to identify IBV infections in relation to a clinical problem in the field. This may also include typing of the isolate involved in order to enable the choice of a vaccination programme with the best chance of achieving sufficient protection against an IBV infection in the next flock. Vaccination represents a very useful method in IBV controlling [8].

Timing of optimal vaccination, doses used and administration routes represent the most important factors in controlling the disease. In practice we use active attenuated vaccines, because the inactive ones prove to be less efficient for inducing the active immunity of the chickens with maternal antibodies.

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Testes commonly used are the haemaglutination inhibition (HI) test, the agar gel precipitation test (AGPT), and the enzyme-linked immunosorbent assay (ELISA). The virus neutralization test (VNT) is rarely used for routine diagnosis because it is relatively expensive and laborious. In this study we had determined the IBV antibody titers of broiler chickens using ELISA, after vaccination with several live, lyophilized vaccines, inoculated through oral via [3,5].

Materials and methods

Two hundred and forty 7-day-old ROSS 308 broiler chicken were allotted into 6 groups, 5 experimental and a group as control one. They were placed into separate sterile rooms of the laboratory animal house under strict hygienic and standard management condition.

The birds of each experimental group were vaccinated by eye drop with 0.5 ml of different live attenuated IB vaccine at 8 days of age but control group did not receive any IBD vaccine. Studied vaccines including: H120 Razi, Bronhikal H120 veterina, Bronhopest H120+B1 veterina, BronhopestH120+Lasota veterina and HIPRAVIAR Colon/H120, CL/79 HIPRA. Blood was collected from 30 birds at random in each group before vaccination, at 15 and 22 days post-vaccination. Serum was separated, heat inactivated and subjected to ELISA (IDEXX kit) test [4]. All of the chickens in 6 groups were received IBD vaccine D78 serotype in 14 days old with water drinking method and ND vaccine strain B1 and Lasota at 8 and 18 days of age via eye drop and water drinking method respectively. The groups with kind of vaccine and vaccine strain were shown in table 1.

Table 1. The groups with vaccine strains in different IB vaccines.

<table>
<thead>
<tr>
<th>Groups</th>
<th>IB vaccine</th>
<th>Vaccine strain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp. Group 1</td>
<td>Razi</td>
<td>H 120</td>
</tr>
<tr>
<td>Exp. Group 2</td>
<td>Bronhikal</td>
<td>H 120</td>
</tr>
<tr>
<td>Exp. Group 3</td>
<td>Bronhopest B1</td>
<td>H 120</td>
</tr>
<tr>
<td>Exp. Group 4</td>
<td>Bronhopest Lasota</td>
<td>H 120</td>
</tr>
<tr>
<td>Exp. Group 5</td>
<td>HIPRAVIAR – CL 79/H120</td>
<td>H 120</td>
</tr>
<tr>
<td>Control group</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results:

The antibody response to vaccination was assessed using the ELISA test by taking blood samples three times, first the day before and the next, 7&14 days post vaccination Results indicated that difference between the mean antibody titers of all groups were significant at the 0.05 level (P<0.05), at 7 and 14 days post vaccination in comparison with control group. And in multiple comparisons, there were difference between the mean antibody titers of some of the groups either.

The group that has been vaccinated by HIPRAVIAR Colon/H120, CL/79, HIPRA vaccines showed the highest level of antibody titer.

Table 2: Mean standard deviation, Mean (+ SEM) and statistical comparison titers obtained in ELISA test.

<table>
<thead>
<tr>
<th>Day Group</th>
<th>7(d-1)</th>
<th>15(d+7)</th>
<th>22(d+14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Razi</td>
<td>588±6/19/86</td>
<td>903±53/6 e</td>
<td>2340±68±158/5 c</td>
</tr>
<tr>
<td>Bronhikal</td>
<td>579±5/23/73</td>
<td>234±159/89 bcd</td>
<td>3193±9/116/97 b</td>
</tr>
<tr>
<td>Bronhopest B1</td>
<td>570±6/21/85</td>
<td>2160±1:18/43 c d</td>
<td>2940±5±164/39 b</td>
</tr>
<tr>
<td>Bronhopest</td>
<td>607±3/33/03</td>
<td>2497±7±97/12 bcd</td>
<td>3042±5±158/28 b</td>
</tr>
<tr>
<td>Lasota</td>
<td>588±8±31/18</td>
<td>2713±9±169/32 bc</td>
<td>3197±6±114/91 b</td>
</tr>
<tr>
<td>Hipraviar</td>
<td>599±9±27/75</td>
<td>185±7±39/83 a</td>
<td>87±4±41/2 a</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Means with unlike superscript letters differ (P<0.05).

Discussion:

Today it is emphasized in all over the world to carry out biosecurity and birds vaccination to prevent bronchitis by live and dead vaccines [1]. Usually when a vaccination program is not able to cause protective immunity against objected diseases or some diseases appear in the farm that vaccination had carried out against them, the first cause that becomes mooted as the original guilty is the type and the quality or the used vaccine. Does vaccine that is used has any side effect and couldn’t act well? And is this concluding always real [6]. There is no doubt that most of the produced vaccines (but not all of them) have desirable quality and they are produced in the factories that have advanced possibilities and experienced staffs. In all of these companies there is a section of research and development that acts according to recent programs of qualitative control [7].

As a matter of fact these centers to have circulation of affair and to could sell their products, always are compelled to put always quality, as epigraph of their affairs. Otherwise they won’t have ability to confront with their own competitors. Despite it’s seen in most cases that vaccines are polluted by external elements and occasionally pathogens or they don’t have enough efficiency and they don’t construct adequate immunity against disease [6].
Prosperity in vaccination depends on various factors such as vaccine, immunological quality of virus that is used in producing vaccine, antigenic stability, and amount of virus that is used according to every level of vaccine and in addition, it is dependent on the features of the virus itself. Vaccines of veterinary have to be evaluated and controlled by impartial and self-sufficient researchers before agreement for commercial usage of them by producers in different countries [10]. Completed studies are upon creational immunity by bronchitis of various live vaccines to indicate significant disagreements among infectious bronchitis vaccines with type H120 with product of different companies that are according to conclusion of present study [11]. In a study were seen significant disagreements among bronchitis vaccines. Also these statistic agreements were seen among variant and classic bronchitis type [1]. In another study it is showed that vaccinated birds with different bronchitis vaccines have resistance or same immunity against temptation to Penemo virus of birds which is according to creational immunity by applied vaccines in present study [3]. It is also showed in a study that different bronchitis vaccines with the same type can construct different standard of antibody in birds which these differences can be related to the amount of extant particles in vaccine and quality of its product that is exactly according to conclusions of present study [4,6]. In another study expressed that other than elements in other studies as the reason of differences standard of making antibody in spite of same type of bronchitis vaccines, it pointed to the way of using vaccine by breeders [10]. Also in a study had distinguished that, in some cases maternity immunity in hens can cause differences among standard antibody of bronchitis vaccines with same type in different flocks [9]. Repeatedly vaccines viruses were chosen and selected by producers. To improve their power of producing immunity improved or their use fulfill with certain methods. Despite these descriptions extent of the differences in vaccines quality of various producers, seem obvious in spite of applied sameness virus type and confident use of these vaccines by veterinarians in vaccination program requires more knowledge and ability of producing immunity and standard of antibody which is obtained by these vaccines that sometimes could be more different from claim of producer companies [11]. It is obvious that contents of vaccines anti gene to serological answers after vaccination is important and in its own turn the way of production and type of virus in vaccine could affect serological answer [11,12]. Conclusions of present study indicates that significant differences of standard antibody resulting from different bronchitis vaccines examined in this research construct low standard antibody in spite of sameness in their virus type and this is a warning for producers specially internal producers to promote the quality of products to stay in market and economical field and also a warning to consumers and specially veterinarians to use these vaccines with more knowledge.

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References
