Clinical Evaluation the efficacy of Tri-Reo vaccine in broiler breeders by ELISA method

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Abstract: Reoviruses are ubiquitous in chickens and turkeys; some strains become viremic and localize in the large joints, resulting in arthritis, tendinitis, and synovitis. Avian Reovirus Vaccine is a Killed Virus for the subcutaneous or intramuscular revaccination of healthy chickens 10 weeks of age as an aid in the prevention of signs and lesions associated with avian reovirus infections which cause malabsorption syndrome. The aim of present study was to clinical evaluation the efficacy of Tri-Reo vaccine in broiler breeders by ELISA method. In this study which carried out during the 2012, we worked on the poultries of 2 farms with 6 halls in each, in that, salon No. 6 considered as control group. Others were considered as experimental group with different titrs of vaccine. In these farms, the first Tri-Reo vaccination applied on week 7 and the second time was on week 19. In fact, the Tri-Reo vaccine was administrated two times during the study. At the end, blood samples were obtained from chickens for laboratory procedures. The data showed that the titr obtained on day 1 was lesser than titr obtained after second vaccination in both farms (p<0.05). In conclusion, it shows the necessity of further investigations in other parts of our country as well as other flocks such as layers, layer breeders and broilers. The investigations should consider different aspects of the disease to identify risk factors which may be responsible for pathogenicity of the virus.

Keywords: Tri-Reo, Reovirus, vaccine, broiler breeder, ELISA.
Blood clots and hemorrhages are seen with rupture of the gastrocnemius tendon. Pitted erosions of the cartilage of the distal tibiotarsus are seen with flattening of the condyles (Pass et al., 1982; Van der Heide et al., 1981). Histologically, the synovial cells are hypertrophied, hyperplastic, and infiltrated by lymphocytes and macrophages. The synovia contains heterophils and macrophages. Infiltration of heterophils or lymphocytes, or both, between myocardial fibers is a constant finding. However, the infiltrating heterophils are difficult to distinguish from the clusters of young, proliferating heterophils (ectopic myelopoiesis) that are present in the heart muscle of all young, rapidly growing broiler chickens (Vertommen et al., 1980; McFerran et al., 1976). A presumptive diagnosis can be based on unilateral or bilateral swelling of the tendons of the Shank and tendon bundle above the hock and on the inflammatory changes in the tendons and synovia described above. Virus from affected tissues can be isolated in primary kidney, liver, or lung cells, or in the yolk sac or chorioallantoic membrane of embryonating chicken eggs. The agar-gel-precipitin test is usually positive, and most birds are positive early in the infection. Virus neutralization tests and challenge of immunized chickens are used to detect the specific serotype. Culture procedures should be used to differentiate mycoplasmal and other bacterial infections. Other causes of lameness should be considered (Bagust and Westbury, 1975).

Avian Reovirus Vaccine is a Killed Virus for the subcutaneous or intramuscular revaccination of healthy chickens 10 weeks of age as an aid in the prevention of signs and lesions associated with avian reovirus infections which cause malabsorption syndrome. Progeny of vaccinates are aided in the prevention of signs of malabsorption associated with reovirus disease via maternal antibodies. It is essential for best protection to prime birds at least once with live virus vaccine for Tenosynovitis (Cook, 1991). The aim of present study was to clinical evaluation the efficacy of Tri-Reo vaccine in broiler breeders by ELISA method.

2. Materials and methods

In this study which carried out during the 2012, we worked on the poultries of 2 farms with 6 halls in each, in that, salon No. 6 considered as control group. Others were considered as experimental group with different titrs of vaccine. The total number of poultries was 97000 broiler breeders. In these farms, the first Tri-Reo vaccination applied on week 7 and the second time was on week 19. In fact, the Tri-Reo vaccine was administrated two times during the study. The other vaccines that chickens received were as below:

Bronchitis vaccine (H120), levack vaccine, dual live vaccine Newcastle+bronchitis, live bronchitis vaccine (4/91), dual killed vaccine clone+influenza, LaSota, Gambro live vaccine, MS live vaccine, ORT killed vaccine, TRT killed vaccine, CAV, POX, ILT, infectious coryza, AE vaccine and quad vaccine. It must be noted that chickens have not received Tri-Reo vaccine so far. At the end of the period, blood samples were obtained by chance and were analyzed in term of Tri-Reo vaccine titr using the IDEXX ELISA kit. The data were compared with those obtained from the day 1 analyses.

Data were analyzed statistically using the SPSS software and P<0.05 considered as statistically significant.

3. Results

In general, the data showed that the titr obtained on day 1 was lesser than titr obtained after second vaccination in both farms (p<0.05). In farm No. 1, the mean value of titr prior the study and after second vaccination was 7500.8 and 19754.6, respectively (table 1). In farm No. 2, the mean value of titr prior the study and after second vaccination was 9161.667 and 17379.17, respectively (table 2).

Table 1: titrs obtained from chickens of farm No. 1

<table>
<thead>
<tr>
<th>No. of hall</th>
<th>Titr on day 1 (CV%)</th>
<th>Titr before first vaccination (CV%)</th>
<th>Titr after second vaccination (CV%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10135 (20.1)</td>
<td>1036 (60.4)</td>
<td>22738 (27)</td>
</tr>
<tr>
<td>2</td>
<td>6068 (44.8)</td>
<td>470 (31.1)</td>
<td>23671 (31)</td>
</tr>
<tr>
<td>3</td>
<td>9097 (17.1)</td>
<td>1241 (47.8)</td>
<td>23289 (20)</td>
</tr>
<tr>
<td>4</td>
<td>6721 (22.2)</td>
<td>351 (38.6)</td>
<td>22670 (28)</td>
</tr>
<tr>
<td>5</td>
<td>4627 (37)</td>
<td>888 (61.1)</td>
<td>25276 (33)</td>
</tr>
<tr>
<td>6</td>
<td>8357 (19)</td>
<td>884 (44)</td>
<td>884 (44)</td>
</tr>
</tbody>
</table>

Table 2: titrs obtained from chickens of farm No. 2

<table>
<thead>
<tr>
<th>No. of hall</th>
<th>Titr on day 1 (CV%)</th>
<th>Titr before first vaccination (CV%)</th>
<th>Titr after second vaccination (CV%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9836 (59.4)</td>
<td>5322.7 (8)</td>
<td>17772 (25)</td>
</tr>
<tr>
<td>2</td>
<td>9050 (58.3)</td>
<td>5403.4 (9.1)</td>
<td>16217 (23.5)</td>
</tr>
<tr>
<td>3</td>
<td>9624 (57.8)</td>
<td>5356.6 (8.9)</td>
<td>17439 (29.7)</td>
</tr>
<tr>
<td>4</td>
<td>8999 (54.6)</td>
<td>5402.3 (7.1)</td>
<td>18545 (17.5)</td>
</tr>
<tr>
<td>5</td>
<td>9015 (57.4)</td>
<td>5423.3 (7.8)</td>
<td>17597 (18.7)</td>
</tr>
<tr>
<td>6</td>
<td>8456 (56.3)</td>
<td>5381 (9)</td>
<td>16550 (18.5)</td>
</tr>
</tbody>
</table>

4. Discussion and conclusion

Vaccination plays an important part in the health management of the poultry flock. There are numerous diseases that are prevented by vaccinating the birds against them (Bacon, 1992; Keck et al., 1993). The purpose in using a vaccine to prevent a particular disease is to trigger or boost the bird’s immune system to produce antibodies that in turn...
fight the invading causal organisms. A natural invasion that actually causes the disease will have the same result – the bird will produce antibodies that fight future invasion. Unfortunately the damage done to the bird suffering such disease is usually too great and the bird either dies or becomes unthrifty and non-productive. A natural invasion caused infection will be uncontrolled and has the possibility of causing severe damage. Vaccination is a way of obtaining a controlled result with a minimum of harm to the birds. Vaccines are generally fragile products some of which are live but in a state of suspended animation (Cook, 1991). Others are dead. All have a finite life that is governed by the way they are handled and used. Handling and administration procedures also influence the potency of many vaccines and consequently the level of immunity the bird develops. After administering a live vaccine in poultry, the vaccine virus must infect target cells and replicate, increasing their numbers in order to stimulate the immune system (Baxendale, 1996). If the vaccine is administered properly to healthy birds, a 'normal' vaccine reaction will occur (Baxendale, 1996).

Avian reoviruses have also been associated with other disease conditions in chickens where the role of the virus is less clear and indeed sometimes tenuous. These include enteric problems such as cloacal pasting and mortality (Dutta and Pomeroy, 1969), ulcerative enteritis (Krauss and Ueberschar, 1966), enteric disease (Dutta and Pomeroy, 1969), respiratory disease (Fahey and Crawley, 1954; Petek et al., 1967), inclusion body hepatitis (McFerran et al., 1976), increased mortality and heart lesions in young broilers (Bains et al., 1974), sudden deaths in young broilers associated with lesions in the heart, kidney and liver (Bagust and Westbury, 1975) and the variously named runting/malabsorption/brittle bone disease in young broilers (Goodwin et al., 1993; Page et al., 1982; Pass et al., 1982; Van der Heide et al., 1981; Vertommen et al., 1980). Recently, sudden deaths have been reported in young broilers in Poland. The disease was characterised by liver lesions, from which a reovirus was isolated which could reproduce the disease experimentally (Z. Minta, personal communication).

Avian Reovirus has been implicated in many disease syndromes and is not discernible from other poultry diseases by clinical examination; therefore laboratory diagnosis of the disease is required. In comparison with the existing antibody assay technique in viral neutralization of AGP, the ELISA method offers high sensitivity and is more simple, faster and less expensive (Slaght et al., 1978). But this test is not effective to detect all Reovirus strains and serotypes. So negative results obtained by commercial ELISA cannot reject the presence of anti-Reovirus antibodies. This fact restricts the results for interpretation. Furthermore, ELISA test cannot distinguish between Reovirus vaccine and natural Reovirus antibodies. Reovirus-associated disease has been reported predominantly in the United States (Glass et al., 1973; Dobson and Glisson, 1992; De Herdt et al., 1999). In Europe clinical signs of the disease have been observed sporadically (De Herdt et al., 1999). Results derived from a seroprevalence study on Nigerian poultry show that the prevalence of Reovirus antibody is 41% (Owoade et al., 2006). In Iran for the first time Khodashenas and Aghakhan (1992) isolated and characterized avian Reovirus from the case with malabsorption syndrome and arthritis/tenosynovitis. In conclusion considering the high prevalence put emphasis on the vaccination of the breeder flocks to reduce the economic losses of the disease. It also shows the necessity of further investigations in other parts of our country as well as other flocks such as layers, layer breeders and broilers. The investigations should consider different aspects of the disease to identify risk factors which may be responsible for pathogenicity of the virus.

References:


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