مجلة جامعة كركوك للعلوم الزراعية ... المجلد (9) العدد (2) 2018
Journal of kirkuk University for Agricultural Sciences ...Vol (9) No. (2) 2018

Finding The Best Method To Vaccinate Against Infectious Bronchitis And Infectious Bursal Disease In Erbil City

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- Date of research received 3/4/2016 and accepted 4/10/2016

Abstract

240 chicks of Cobb broiler breed divided in to 4 groups (60 bird/group) as follow: Group1(control group) which vaccinated just against Newcastle Disease (ND) with Lasota strain (Intervet SP) via drinking water (DW) at 10, 20 and 30 days of age. Group 2 (T1) was vaccinated against ND as in control group plus coarse spry vaccination against Infectious (IB) with MA5 strain(Intervet SP) at one day of age and drinking water vaccination against Infectious Bursal Disease (IBD) with D78 strain (Intervet SP) at 7 and 14 days of age respectively , while Group 3 (T2) was vaccinated against ND as pervious groups plus day old coarse spry vaccination against IB with MA5 strain then IB strain 4/91(Intervet SP) by DW at 17 days old plus vaccination against IBD strain D78 via DW at 7 and 14 days of age respectively. Group 4 (T3) ND vaccination as group 1 plus day old IB strain4/91 vaccination (coarse spray) and IBD strain D78vaccination via DW at 7 and 14 days old. Blood samples at day old & 35 days old checked by ELISA for Abs titer of IB , IBD & ND. The results of study indicate that G2(T1) show best antibody titer against IB using strain MA5 via coarse spray at one day of age , also G2(T1) show better IBD immune response when compared with titers of antibody of other groups , that means the method of vaccination and the strain used will induce better protection level against IB and IBD depending on level of maternal Abs for IBD .

Key words : Infectious Bronchitis , Iinfectious bursal diseases, Maternal immunity.

ايجاد افضل طريقة للتلقيح ضد مرض التهاب القصبات المعدي ومرض التهاب جراب فابريشيا (الكمبورو)

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- تاريخ تسلم البحث 2016/4/3 وقبوله 2016/10/4

الخلاصة

اجريت هذه الدراسة لايجاد افضل طريقة للتلقيح ضد مرضي التهاب القصبات المعدي والكمبورو وذلك في حقل كردة رش العائد لكلية الزراعة في جامعة صلاح الدين حيث تم تربية 240 من ذكور افراخ اللحم من سلالة الكوب (cobb) وتم تقسيم هذه الطيور الى اربعة مجاميع بواقع 60 طيرا لكل مجموعة علما ان الافراخ تم تغذيتها على العلف المضغوط البلت بشكل حر وكانت المجاميع كالاتي: المجموعة الاولى مجموعة السيطرة التي لقحت فقط ضد مرض النيوكاسل بالاعمار 10 و20 و30 يوما بعترة لاسوتا عن طريق ماء الشرب والمجموعة الثانية المعاملة (T1) التي لقحت ضد مرض النيوكاسل كما في مجموعة السيطرة بالاضافة الى التلقيح ضد مرض التهاب القصبات المعدي بعترة MA5 طريق الرش الخشن بعمر يوم واحد ولقحت ضد مرض الكمبورو بعترة D87 بعمر 7و14 يوما عن طريق ماء الشرب ، اما المجموعة الثالثة (T2) لقحت ضد مرض النيوكاسل بالاعمار 10 و20 و30 كما سابقتها بعترة لاسوتا بماء الشرب فضلا عن التلقيح ضد مرض التهاب القصبات المعدي بعترة MA5 طريق الرش الخشن بعمر يوم واحد ولقحت بعترة 91-4 بعمر 17 يوما عن طريق الشرب بالاضافة الى التلقيح ضد مرض الكمبورو بعمر7 و14 يوما بعترة D87 طريق ماء الشرب واخيرا المجموعة الرابعة (T3) فقد لقحت ضد مرض النيوكاسل كما المجاميع السابقة بالاضافة الى التلقيح ضد مرض التهاب القصبات المعدي بعترد 91-4 بعمر يوم واحد عن طريق الرش الخشن ، كم لقحت ضد مرض الكمبورو بعمر 7و14 يوما بعترة D87 طريق ماء الشرب . النتائج في المحصلة اظهرت انه المجموعة (T1) اعطت احسن النتائج لمعدلات الاضداد لمرضي التهاب القصبات المعدي والكمبوروبالاضافة الى مرض النيوكاسل عند مقارنتها مع نتائج معدلات الاضداد للمجاميع الاخرى وهذا يدل على ان طريقة التلقيح المستعملة في هذه المجموعة للحماية من مرض التهاب القصبات المعدي (ماء الشرب بعمر يوم واحد بعترة (MA5) و التهاب جراب فابريشيا (الكمبورو) ماء الشرب بعمر 7 و14 يوم بعترة D78 كانت احسن من الطرق الاخرى المتبعة في المجاميع الاخرى من ناحية و من ناحية طريقة اعطاء اللقاح والعمر واختيار العترة المناسبة للقاح للحماية من هذه الامراض.

الكلمات المفتاحية : التهاب القصبات المعدي، التهاب جراب فابريشيا.

Introduction

Infectious Bronchitis consider one of the epidemic respiratory diseases over the world infecting poultry in different ages, infect genital tract of female layer and parent breeder leading to produce bad eggs quality , decrease production level , swelling of kidney & finally high mortality. (5)

Caused by RNA virus, corona virus family, its diameter about 50-100 nanometer enveloped and has hrawish spikes which plays important role in cell infection also in immune stimulation of host , therefore used in serological classification and in agglutination inhibition (HI) test for diagnosis of the disease. (17)

Infectious Bronchitis virus characterized by appearance of heterogeneous strains in different periods and this occurs due to genetic mutation or reassortment between different strains of this virus and this belongs to genes of spiks which changed and this occur when the flock infected with more than one type of strain. Sometime so many strains appeared otherwise the famous strain like Massachuesetts, Connecticut, thus new strains will appear as lawa, American Arkansas and other European heterogenous strain like CR88, 4/91, D1416, 793B, D273, Italyo 2 and Chiness QX at 2002. (16)

Infectious Bursal Disease (IBD) considered an acute infectious disease which is characterized by inflammation and partial atrophy of bursa of fabricia so result in damage of most important immune organ leading to immunosuppression and Failuer of bird to response to vaccines. (11)

The disease usually affect chicken at 3 weeks age and over, white chalky material adhesion to the vent, with diarrhea & ruffled feather will be seen.The virus has high ability of resistance against the chemical and physical agents this prosperity clear the hard nature of the virus and its survival in the poultry houses even through cleaning and disinfecting procedures followed. (4)

Incubation period of disease IBD is short and clinical signs began within 2-3 days after infection, post mortem of died birds shows enlarged congested bursa with gelatinous materials which gradually atrophy indicating destruction of lymphatic follicles of bursa caused by virus (7).Morbidity may reach 100% while mortality up to 20-30 % this indicates the high economic losses caused by this diseases for this reason the vaccination is the best way to protect broiler from the virus (8).

Material and Method

1. Chickens:

Two hundred forty Cobb breed day old chicks used & reared in Girda rash research farm belongs to college of Agriculture/ Salahddin University for about 42 days, the birds divided in to 4 equal groups, 60 chick per group, separated from each other and give them feed and water ad libitum.

The groups had been divided by following way:

Group 1 (Control group): Vaccinated only against Newcastle Disease (ND) with Lasota strain at 10, 20 and 30 days of age respectively through drinking water.

Group 2 (T1): Vaccinated against ND at 10, 20 and 30 days of age as in control group, also vaccinated against Infectious Bronchitis(IB) at one day old (coarse spry) using IB strainMA5(intervet SP) and vaccinated against Infectious Bursal Disease (IBD) at 7 and 14 days of age using D78 strain(intervet SP).

Group 3 (T2): Vaccinated against ND at 10, 20 and 30 days of age as in control group , vaccinated against IB at one day old by coarse spry with IB strain MA5, then at 17 days of age with IB strain

4/91(intervet SP) through drinking water . Also this group vaccinated against IBD at 7 and 14 days of age through drinking water with IBD strain D78 .

Group 4 (T3): Vaccinated against ND at 10, 20 and 30 days of age as in the previous groups, & vaccination against IB at one day old with IB strain 4/91 by coarse sprays , also vaccination against IBD with strain D78 by drinking water at day 7 & 14 respectively.

2. Feed :

Special broiler feed formulation used in preparation of bird feed : starter feed was given from first day to day 14 including 22% crude protein and 2850 kcal energy , then replaced grower feed 20% crude protein and 2950 kcal energy until 21 days of age, Finally replaced by finisher feed with 18% crude protein and 3050 % kcal energy until slaughtering.

3. Serology :

Blood samples were taken at ages of one day old & 35 days , ELISA test was conducted on the serum samples using special kits of BioCheck company (Holland) following their manual instruction as below:

A- At One day : blood sample taken to measure maternal immunity level of ND, IB and IBD by ELISA test.

B- At 35 day : blood sample taken to measure antibody level against ND, IB and IBD induced by vaccination using ELISA test

4. Statical analysis:

Data were analyzed by one way ANOVA test . Means with different alphabetical superscripts in the same row are significantly different at $P \leq 0.05$**.**

Results

Table No (1) show different methods of vaccination programs used in the present study against ND, IB and IBD disease in different ways and different ages and strains , while table No. (2) illustrate the level of Abs titer against IB in broiler chicken which measured by ELIZA test in which G2(T1) record highest level 1542± 258.90 comparable to the control G1, G3(T2) and G4(T3) where are 852± 94.28 , 938± 132.8 and 996± 218.226 respectively , in which G2(T1) differ from other groups significantly ($p \leq 0.05$).

Table No (1): Groups of treatment birds and vaccination ways in Broiler Chickens.

Vaccination Program / Groups	IB Vaccination	IBD Vaccination	ND Vaccination
G1 Control	No Vaccination	No Vaccination	10, 20,30 Day (LaSota) Drinking Water
G2 (T1)	1 Day-(MA5) coarse spry	7&14 day (D78) Drinking Water	10, 20,30 Day (LaSota) Drinking Water
G3 (T2)	1 Day- (MA5)coarse spry , 17 day (4-91) Drinking water	7&14 day (D78) Drinking Water	10, 20,30 Day (LaSota) Drinking Water
G4 (T3)	1 Day (4-91) coarse spry	7&14 day (D78) Drinking Water	10, 20,30 Day (LaSota) Drinking Water

Table No. (2) the level of Abs against Infectious Bronchitis in broiler chicken

Groups / Age	G1 (Control)	G2 (T1)	G3 (T2)	G4 (T3)	S.A
1 Day of age	1901± 247.60 a	1860± 374.51 a	1896±289.26 a	1894± 314.90 a	N.S
35 Day of age	852± 94.28 a	1542± 258.90 b	938± 132.8 a	996± 218.226 a	*

Notes : S.A. (statical analysis SAS 2005) , N.S.: not significant ,* : significant

Table No (3) show the result of vaccination programs against IBD which appear that G2(T1) induce highest level of Abs titers which significantly differ 8728±623.62 ($p \leq 0.05$) from other groups as follow G1:383±81.74 , G3:7756±1086 , G4:7723±3468.42 respectively. While table No. 4 appeared that G2 record highest level of Abs titer (3594±1215.2) but without significant differences from G1 (3234±680.47) , otherwise it differ significantly from G3 (2506± 144.80) and G4(2708± 451.89) respectively .

Table No (3): the level of immunity (Abs titers) against Infectious Bursal Disease (Gumboro) in the broiler chickens.

Groups / Age	G1 (Control)	G2 (T1)	G3 (T2)	G4 (T3)	S.A
1 Day of age	4991± 438.88 a	4951±835.82 a	4997± 2411.32 a	4992±494.02 a	N.S
35 Day of age	383± 81.74 b	8728 ± 623.62 a	7756± 1086.08 a	7723± 3468.42 a	*

Notes : S.A. (statical analysis SAS 2005) , N.S.: not significant ,* : significant

Table No (4): the level of immunity (Abs titers) against Newcastle Disease in the broiler chickens.

Groups / Age	G1 (Control)	G2 (T1)	G3 (T2)	G4 (T3)	S.A
1 Day of age	8323±559.43 a	8319±1086.7 a	8330± 647.60 a	8327±849.22 a	N.S
35 Day of age	3234±680.47 a	3594±1215.2 a	2506± 144.80 b	2708± 451.89 b	*

Notes : S.A. (statical analysis SAS 2005) , N.S.: not significant ,* : significant

Discussion

As in human medicine , in the last 50-60 years has been tremendous progress in the development of vaccines to protect chicken against both viral and bacterial diseases . In fact vaccine have become such a common every day part of poultry production that's is easy to be complement and forget that poultry producers could suffer massive losses in flocks due to viral infection such as AIV , IB , IBD and others ,in this paper we were try to find the best way and time to applied our vaccine against some important viral diseases which can affect poultry farm in general and broiler flocks specially , thus when we look to table No. (1) it appear the program of vaccination applied in this study against IB , IBD and ND viruses respectively .

In table No. (2) we notice G2(T1) record the highest level of Abs against IB disease comparable with those of G3(T2) , G4(T3) and G1(control) in which the differences were significant ($p \leq 0.05$) , even G4(T3) appear higher level than G3(T2) but the differences not significant , this result indicate that coarse spray at one day of age with(MA5 strain) induce higher level of immunity and chicken

body produce more Abs against IB disease when compared with other ways of vaccination , this agree with previous study done by(12) when he use different strains of IB virus by drinking water and coarse spray in two different broiler breeder farm , as a result he was found the breed vaccinated with more than one strain and way show less level of Abs than the breed vaccinated with one strain.

Table No. (3) illustrate the titers of Abs against IBD (Gumboro disease) of vaccinated broiler and the results showed that G2(T1) record highest level with significant differences ($p \leq 0.05$) comparable with G1(control) , G2(T1) and G4(T3) , this may belong to the maternal Abs titers which exam at one day of age , so the group that has highest level interfere with Abs level induces by vaccination at 7 days of age which lead to neutralization of maternal Abs with vaccine virus or antigen , this finding improved previously by (9) when he study advantages of recombinant viral vector rHVT/MD and IBD virus he was get that maternal Abs may interfere with the onset of immunity in chicken vaccinated at an early age. Also (13) found that Farms and experimental birds vaccinated with two doses of IBD vaccine (Intermediate and Intermediate plus strains) produce higher immune response than that received one dose of Intermediate vaccine classical strain provided that determine the maternal immunity and when it's the correct time to inoculate the first dose .

The optimal time (day) of vaccination against IBD depend on number of factors including level of maternal derived antibody(MDA) of chick , vaccine strain to be used , it's breakthrough titers and field pressure (6 , 10) . Methods used to estimate the best time of vaccination principally involve monitoring the decay of MDA in chicken to below protective levels. [2 , 14 , 3]

In the other hand table No. (4) appeared at 35 day age of vaccination G1 and G2 showed higher level of Abs titers(3234±680.47) and (3594±121.5) respectively when compared with G3 (2506±144.80) and G4(2708±451.89) with significant differences ($p \leq 0.05$), the reason of this result may be due to interfere of maternal immunity at one day age which was lower in G1(8323±559.43) and G2(8319±1086.7) comparable with other two groups , therefore G3 and G4 which have mentioned higher maternal Abs showed lower tiers of immunity at 35 days of age , this mean that after first vaccination with LaSota via drinking water maternal Abs neutralized by viral vaccine , but the continuous decrease of antibodies after vaccination at 20, 30 days in drinking water may be due to the short interval between the vaccination time in which the antibodies produced by the first dose of vaccine is more likely interfere with the multiplication of the second dose of the virus, therefore there is little to be gained by reducing the interval between vaccinations.[1]

Conclusion

It's concluded that determined the correct time for first vaccination depend on maternal Abs titer when decay , and the best time and way in case of IB was at one day vaccination via coarse spray with MA5strain than other strains and ways. Vaccinate twice at 7,14 days of age against IBD and put enough interval between vaccination against ND specially when maternal immunity is high.

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