

REVIEW ARTICLE

A Reviews on Colibacillosis Native Serotypes in Broiler Chicks at Khuzestan Province

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ABSTRACT

This study was conducted on 240 broiler chicks aimed at reviewing the immunogenicity of vaccines inactivated by Colibacillosis serotypes isolated from broiler chicks at Khuzestan in 2013-2014. In this study, three types of monovalent vaccines and one type of polyvalent vaccine were prepared using native and virulent serotypes of *E. coli* including 078: K80, 0128: K67, 02: K1, and 01 19: B14 isolated in first stage of study using three methods of heating, formalin and ultrasonication. 220 old broiler chicks were selected in a day and randomly divided into four treatments and one control group. During the study, the amount of food intake and body weight, as well as losses of chicks were also recorded. After challenge, more than 95 percent of chicks in control group were infected by Colibacillosis and more than 75% of them were died by this infection; while, losses in vaccinated groups were approximately 4.2%. In the vaccinated groups, natural growth in approximately 95 percent of chicks was continued and no problem was observed after challenge. Generally, in addition to management methods and controlling respiratory diseases, vaccination method is suggested to protect and better control of Colibacillosis in poultry.

Keywords: Native Serotype, Colibacillosis, Boiler Chicks

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INTRODUCTION

Colibacillosis (Fig. 1) is a variety of disease in birds. There are a variety types of *E. coli* in domestic animals and birds. *Escherichia coli* is a Gram-negative bacillus of Enterobacteriaceae family and an opportunistic organism that only a few of its serotypes are pathogen in humans, birds and domestic animals. *Escherichia coli* is normal flora in the gastrointestinal tract of birds.

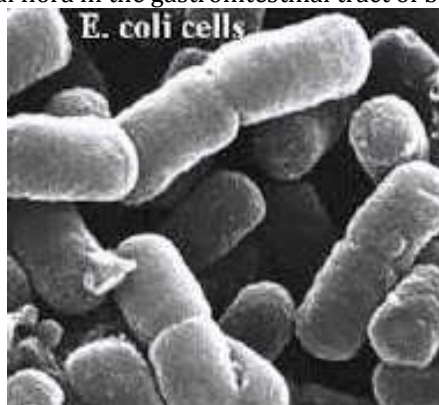


Fig. 1: Colibacillosis

Controlling Colibacillosis is usually possible by prescribing antibiotics and in addition to imposing a heavy cost to manufacturers, microbial resistance is also increased. Thus, prevention of Colibacillosis by vaccination has been interested by researchers. Deb and Harry [1] studied the effect of five inactivated vaccine prepared from O78: K80 serotype in broilers and concluded that an inactivated vaccine contains an additive is more effective than inactivated vaccines without an additive. Kagawa *et al* [2] prepared an attenuated vaccine from genetic mutation of serogroup of o2 and used it in a four-weeks Turkey orally and found a good protection in the vaccine in the face of endotracheal with wild serotype. Peyghambari *et al* [3] attenuated pathogenesis of bacillus with double-bilateral mutation and founded, double mutations reduce the virulence of the bacteria and preventing return to the initial state; therefore, an attenuated vaccine can be effective in preventing Colibacillosis at poultry. In general, different vaccines have been prepared from this bacterium that can be classified in three groups: inactivated vaccines, attenuated vaccines and subunit vaccines and each one has its own advantages and disadvantages [4]. each region and country has various pathogenic Colibacillosis serotypes. Hence, it is better to diagnose pathogenic virulent serotypes in each region and then proceeded for prevention. Based on studies conducted in Iran by Bozorgmehri Fard and Modares Ghilani [5] and Zahraei Salehi and Yahya Raeiat [6], several pathogenic serotypes, including serotypes O78: K80; O128: K67; O2: K1 and O124:K82 have been isolated from birds with Colibacillosis. In the latest study, O78:K80 was a virulent serotype; therefore, in this study the immunogenicity of several serotypes isolated from Colibacillosis in poultry in Iran, particularly O78:K80 have been examined in broiler chicks in Khuzestan province.

MATERIAL AND METHODS

To prepare and exposure of vaccine, suspension has been prepared by four serotypes of *E. coli* including O78: K80, O128: K67, O119: B14 and O2: K1. Serotypes were tested on microscopic slides using a specific antiserum through cross-section by agglutination to ensure purity of serotypes. Serotypes used in this study were injected in 24-day-old chickens and each of the serotypes separately were cultured in agar Brian Hart. After 24 hours of incubation at 37 ° C, cultures of each serotype was rinsed with sterile saline and was poured into a sterile alcohol glass. Then, Mcfarland Nephelometric Method was used for suspension and standardization of any serotype [7]. Vaccines were prepared with the following procedure: 1. formaldehyde monovalent vaccine, 2-polyvalent formaldehyde vaccine, 3- heated monovalent vaccine, ultra-sonicated monovalent vaccine [1] and prepared vaccines were cultured on Mac Cancan medium and blood to ensure sterility of vaccines and inactivation of bacteria. The vaccines were incubated on the shaker at 37°C for 5-4 hours for better and more connection and absorption of additive to the antigen in suspension.

Test was conducted on 240 one-day chicks that divided randomly into 5 groups so that each group consists of three subgroups containing 20 chicks. During of test was 51 days. In this period, common vaccines were used and were vaccinated according to the region. Out of five groups, there was a control group and following vaccines were used for the vaccination of chicks in other groups: Heated vaccine serotypes of P78: K80, Formaldehyde vaccine of serotypes P78: K80, ultra-sonicated vaccine serotypes of P78: K80, formaldehyde polyvalent vaccine containing four serotypes of O78: K80, O128: K67, O119: B14 and O2: K1. D. In the serology test, rapid agglutination and slow agglutination tests in tube were used. Chicks in the experiment and control groups were weighed in the 14 days prior to vaccination, 21, 42 and 49 days-old.

RESULT AND DISCUSSION

Average loss in different group ranging from 14 days to 21 days was 4.1 percent in the control group and 4.1 percent in the group vaccinated with formaldehyde vaccine. Any Losses were observed in the other groups (Table 1). Statistically, there was no significant difference between the groups in term of loss at this stage ($p = 0.52$). at the end of 38 days-old, amount of loss in the control group and formaldehyde vaccine group was respectively 1.3 and 2.6 percent; while, any loss was observed in other experiment groups. Before challenge with virulent strain, there was no significant difference between loss in different groups statistically ($p=0.15$) Up to 43 days-old and also at the end of 49 days-old, highest and lowest loss was observed respectively in control group and ultra-sonicated vaccine group and after challenge, there was a significant difference between control group and other groups in term of loss ($p=0.001$). in control group, 95 percent of chicks were infected with Colibacillosis and many of them died (approximately 75 percent up to 51 days-old) (Table 1). In 14 days-old and 21 days-old, highest weight of chicks was observed in control group and lowest weight was in polyvalent vaccine. In 43 days-old, highest weight was observed in chicks with heated vaccine and lowest weight was in control group. In 49 days-old,

highest weight was observed in chicks with ultra-sonicated vaccine and lowest weight was in control group. Statistically, there was no difference in term of body weight between control group and vaccinated group except polyvalent vaccinated group ($P=0.005$); while, difference between vaccinated groups was not significant (Diagram 1). Different vaccines have been prepared to prevent Colibacillosis in poultry and animals such as triple vaccines containing strains of K99 Colibacillosis, rotavirus and coronavirus that used in several farms in the country. Different vaccines have been prepared and examined in poultry; otherwise, most of researchers state that strain and serotype of Colibacillosis may be different in flocks and regions and antigenic structure of serotype also can represent all properties of its pathogenicity.

Table 1- Average Percent of Loss in Experiment and Control Groups in Term of Group and Age

14-49	14-43	14-38	14-21	Age (Day)	Group
60.2a	50.2a	1.4	1.4	Control	
2.5b	2.7b	-	-	O78:K80 Heated Vaccine	
4.2b	4b	2.6	1.3	O78:K80 Formaldehyde Vaccine	
1.2b	1.1b	-	-	O78:K80 Ultrasonicated Vaccine	
6.6b	6.85b	-	-	Formaldehyde Polyvalent Vaccine	
0.001	0.001	0.15	0.52	P Value	

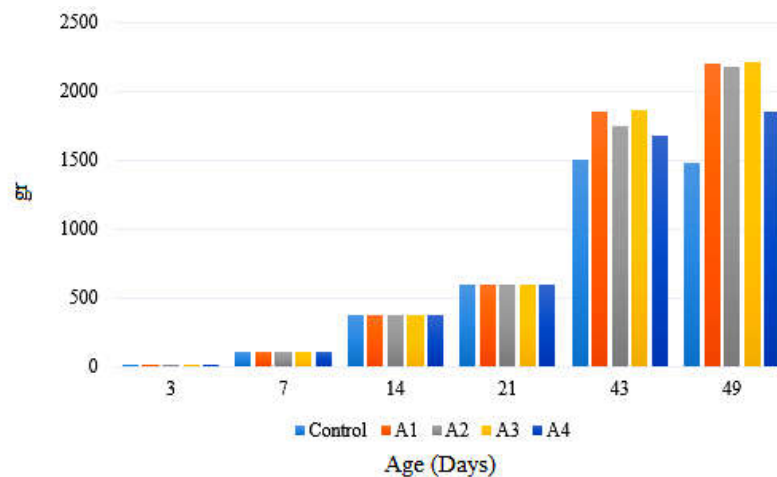


Diagram 1- Average Weight of Boiler Chicks in Term of Age and Experiment Group after Vaccination and Face with Virulent Strain

REFERENCES

1. Deb, R and Harry, E.G (1976). Laboratory trials with inactivated vaccines against Escherichia Coli (O78;K80) infection in fowls. Res. Sci. 20: 131-138.
2. Kwaga, J.K., Allan, B.J., Hurk, J.V., Seida, H and Potter, A.A (1994). A Car AB mutant of avian pathogenic E.Coli serogroup O2 is attenuated and effective as a live oral vaccine against colibacillosis in turkey. Infect. Immunol. 62: 3766-3772.
3. Peighambari, S.M.; Gyles, c.l. (1998). Construction and characterization of avian Escherichia coli cya crp mutants. Avian. Dis. 42(4), 698-710
4. Zahraei Salehi, T (1989). Salmonella, Tehran University Press, Issue 2429, Pages 220-213
5. Bozorgmehri Fard and Modares Ghilani (1978). Check colibacillosis in poultry farms around Tehran." Journal of Veterinary Research, 35, 1: 109-121.
6. Zahraei Salehi and Yahya Raeiat (2001). Preparation of polyvalent anti-sera and diagnostic Mnvдалan against serotypes O2K1, O111B14, O128K67, O2K12." Congress of Immunology and Allergy, Tehran, May 28-30.
7. Calnek, B.W (1997). Diseases of Poultry. 10th ed. Pp: 131-141.

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