

Araştırma Makalesi

EVALUATION OF ANTIBODY LEVEL AGAINST E. COLI K99 IN CLOOSTRUM OF COWS IN SUBURBS OF TEHRAN, IRAN

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Evaluation of Antibody Level Against E. Coli K99 in Cloostrum of Cows in Suburbs of Tehran, Iran

Abstract : "One hundred and twenty colostrum samples were obtained from 120 randomly selected populations of Holstein dairy cows just on day of calving in the south of Tehran. The competitive ELISA kit for serodiagnosis of anti *Escherichia coli K99 (F5)* attachment factor in colostrum (Biox diagnostics) were used. Out of 120 samples, 7 cases (5.83%) showed >80% inhibition in ELISA, which were considered as a high titre colostrum associated with *E.coli K99*, 28 samples had no any anti *E.coli* Ab, 71 samples showed degree of positivity between 1⁺ and 2⁺ and 14 samples were 3⁺. The present study showed that only 5.83% of colostrum samples had high titre of anti *E.coli K99* Ab for passive transfer to protect the calves against diarrhea due to *E.coli K99*. Therefore, it is recommended that vaccination of pregnant cows is necessary for enhancing the titre of Ab in a high percent of them".

Key Words: Cows, Colostrum, *E. coli*, antibody, Iran.

Introduction : The importance of colostrum in the transmission of immunity from mother to offspring was first postulated by Ehrlich in 1892 (7). In Cattle passive transfer of maternal antibodies occurs in the first 20-24 hours after birth via the colostrum. During the immediate postnatal period the gastrointestinal tract undergoes rapid growth with morphological changes and functional maturation related to colostrum ingestion (11). In addition to humoral substances of the colostrum, colostral leukocytes obviously contribute to the passive immunity and resistance of the newborn calf. The quality and quantity of the leukocytes seem to be of crucial importance to their efficiency (2). Group a bovine *rotavirus* (BRV), bovine

corona virus (BCV) and *Enterotoxigenic Escherichia coli K99* are three major causes of neonatal diarrhea in calves throughout the world. The aim of this study was to evaluate the level of Ab against *Enterotoxigenic Escherichia coli K99* in colostrum of non-vaccinated cows in suburbs of Tehran, Iran.

Introduction

The importance of colostrum in the transmission of immunity from mother to offspring was first postulated by Ehrlich in 1892 (7). In Cattle passive transfer of maternal antibodies occurs in the first 20-24 hours after birth via the colostrum. During the immediate postnatal period the gastrointestinal tract undergoes rapid growth with morphological changes and functional maturation related to colostrum ingestion (11). In addition to humoral substances of the colostrum, colostral leukocytes obviously contribute to the passive immunity and resistance of the newborn calf. The quality and quantity of the leukocytes seem to be of crucial importance to their efficiency (2). Group a bovine *rotavirus* (BRV), bovine *corona virus* (BCV) and *Enterotoxigenic Escherichia coli K99* are three major causes of neonatal diarrhea in calves throughout the world. The aim of this study was to evaluate the level of Ab against *Enterotoxigenic Escherichia coli K99* in colostrum of non-vaccinated cows in suburbs of Tehran, Iran.

Material and Methods

One hundred and twenty colostrum samples were obtained from 120 randomly selected populations of Holstein dairy cows just on day of calving in the south of Tehran. The sample reserved in -20°C until experiment. Competitive ELISA test was done by clear colostrum whey, which was prepared by centrifuging colostrum at 2000 g for 20 minute in 4°C and clear phase, under the fat was taken up by gentle pipeting. The competitive ELISA kit for serodiagnosis of anti *Escherichia coli K99 (F5)* attachment factor in colostrum were used (Biox diagnostics, Belgium) its ordered protocol.

Results

Out of 120 samples, 7 cases (5.83%) showed >80% inhibition in ELISA, which were considered as a high titre colostrum associated with *E.coli K99*, 28 samples had no any anti *E.coli* Ab, 71 samples showed degree of positivity between 1⁺ and 2⁺ and 14 samples were 3⁺ (table 1). The OD value of negative and positive control, sera were obtained 1.23 and 0.232 respectively. The lowest OD between the 7 samples that had over 80% inhibition was 0.123, with 90% inhibition, and the highest OD was 0.125 with 82% inhibition.

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Table1: the frequency level of anti *Enterotoxigenic Escherichia coli* K99 in colostrum samples, according to percent of inhibition in competitive ELISA.

Degree of positivity % inhibition				
4+>80%	3+>60%	2+>40%	1+>20%	Neg.<20%
7	14	25	46	28
(5.83%)	(11.66%)	(20.83%)	(38.33%)	(23.33%)

Discussion

Colostrum immunoglobulin passive transfer is one of critical importance in the pathogenesis of many neonatal calves disease (1). Immunoglobulins specifically recognize viral and bacterial agents, enhancing their elimination by direct opsonization, phagocytosis, or activation of the complement cascade (8). Experimental studies presented that not receiving of colostrum in calves after birth was generally followed by septicemia and death in less than 48 hours (3). The presence of anti *E.coli* antibodies with titre of 640 had shown before in colostrum of non-vaccinated cows (5). Also the presence of anti shiga-like toxin antibody was shown in 84% of colostrum by capture ELISA (6). The present study showed that only 5.83% of colostrum samples had high titre of anti *E.coli* K99 Abs for passive transfer to protect the calves against diarrhea due to *E.coli* K99. Valente *et al.* showed that the vaccination of pregnant cows with K99 antigen of enterotoxigenic *E. coli* before calving survived the experimental infection after the suction of colostrum in spite of the fact that the calves from control dams died with diarrhea (9). In other hand usage of the vaccines against ETEC and protection of calves diarrhea is not very clear in the USA that mentioned by some researchers at 20 years before (4) but a resent study advised the usage of vaccination against 17 strains of bacterial agents that cause diarrhea in calves and importance of bovine immune colostrum (10). Therefore, the result of present study was recommended that vaccination of pregnant cows is necessary for enhancing the titre of Ab in a high percent of them.

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