

Immune Response Of The Organism Of Newborns Karakul Sheep Lambs To Vaccination

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Abstract: *There was studied the immunological structure of populations of karakul sheep lambs, vaccinated against coly bacterios, salmonellosis and anthrax antigen from the age of 2-3 days tile 2-3 weeks. There was revealed the nature of wavelike character of the immune reaction of an organism of newborn animals of vaccination. There was determined the immunomodulation role of anti idiotypic antibodies.*

Keywords: *antibodies, colostral antibodies, anti-idiotypic antibodies, bacterial antigens, vaccination, immunity, immune status, karakul lambs.*

1. INTRODUCTION.

We can agree to the confirmation that under conditions of industrial animal breeding, epizootic acute infections loose their lidering significance and they are replaced by diseases, stipulated by conditionally – pathogenic micro flora. First of all it is connected with that, is hard measures of specific prophylaxis are conducted against obligatory pathogenic microorganisms, they are not possible against conditionally – pathogenic microorganisms because they are natural inhabitants of animals organisms[1,6,11].

The numerous researches confirm that problems of conditionally – pathogenic microorganisms are displayed more acutely with re-form and immunodeficient individuals of all types of agricultural animals[3,9,10].

Besides, up to present time at planning and currying out treatment – prophylaxis measures, especially vaccine prophylaxis, it is not enough to take into consideration the individual immune status of microorganism moreover the appeared scientific works are waiting for their generalization and comprehension and for a while they have not become the integrated element in the system of struggle against infections [7,8,13].

Antibodies, developing in animals, organisms and human organisms against antigens of external and internal origin are not limited with opsonization functions, lying on the base of formation of humoral immunity. Being the product of somatic mutations of plasmatic cells, according to clonal selectional theory of immunity, they themselves are also alien proteins for organisms. Thus, they themselves also begin to display antigen pressure on the immune competent system of animals and human. So, they will start themselves the elaboration of antibodies against them, which are called anti idiotypic ones[2,5,12].

Anti-idiotypic antibodies, imitating the corresponding bacterial and virus antigens are able to initiate the immune response of animals organism against them, which play great immune modulating role[1,4,12].

2. Scope And Methods Of Research.

The researches were carried out with 1-2, 3-4, 5-6, 7-8, 9-10 and 11-12 weeks old karakul sheep lambs in the stud form “Nurata” of Nurata district of Navoi region of the Republic of Uzbekistan.

The determination of titles of postvaccinal antibodies against all the studied bacterial antigens were carried out in the reaction of agglutination according to Rayt. For carrying out the reaction of agglutination as antigen there was used the living daily culture of pathogenic coli bacteria, salmonella, singled out in the laboratory of microbiology of Uzbek scientific – research Institute of veterinary.

The titles of normal hemagglutinins were determined in relation to washed up poultry erythrocytes with physiological solution. The titles of anti-anthrax precipitins in the reaction of scaly and according to immunodiffusion of anti-enterocock precipitins.

3. RESEARCH RESULTS

The immunological structure of karakul sheep lambs population vaccinated against colybaerious and salmonellyoz from the age of 2-3 days. The experimental lambs during bonitration were vaccinated one time with associated hydroxidealuminium formal vaccine against colybaerious and paratyphus of calves, piglets and lambs.

As it is shown, the results of experiments, adduced in the table 1 are as follows: antibodies are registered with lambs of the age of 1-2 weeks, vaccinated against colybaerious and paratypus at the age of 2-3 days, both against vaccinating antigens, and against erythrocytes of poultry.

Table 1 . The dynamics of title of specific and normal agglutinins in the serum of blood of karakul – sheep lambs, vaccinated form the age of 2-3 days against colybaerius and salmonellosis (M±m)

№	Spectrum of agglutinins	The age (in weeks) and a quantity (n=) of lambs			
		1– 2 (n=120)	3 – 4 (n=120)	5 – 6 (n=115)	7 – 8 (n=70)
1	Coly agglutinin	1:125 ±1,02	1:140 ±1,08	1:50 ±0,65	1:140 ±1,41
2	Salmonella agglutinin	1:80 ±0,81	1:85 ±0,84	1:50 ±0,65	1:115 ±1,28
3	Haemo agglutinin	1:16 ±0,36	1:12 ±0,31	1:10 ±0,29	1:26 ±0,60

As it is seen from the table, the titles of anti-salmonellosis agglutinins and haemoagglutinins of lambs of the age of 1-2 and 3-4 weeks fluctuated approximately on the same degree, and titles of anti-colybacterial agglutinins considerably raised. On the 5-6 weeks of postnatal life the title of agglutinins against vaccinating antigens sharply reduced up to negative meanings in mixing the serum with water for the reaction of agglutination – 1:50 and higher. On the 7-8th weeks of postnatal life the title of specific agglutinins vaccinating antigens raised again up to previous meanings and even higher, though the revaccination was not carried out.

It was revealed that two waves of the immune reaction of lambs of the same experimental group have different nature. If to take into consideration that the immune status and immunity in general may be of 2 types: passive and active, it is possible to confirm, that the first wave of the growth of the title of agglutinins is passive, that is non postvaccinal, and the second wave – active – postvaccinal or another origin.

At the of 5-6 weeks, when there was observed the immune falling off in all 3 agglutinines, distinct tendency was not revealed. It is possible to permit that this testifies about transitive character of this period, when the organism develop from the colostral immunity to creation of active immunity.

The results of the experiment persuade us that 2 peaks of the raising and falling of the lever of immune bodies in the serum of blood of lambs, vaccinated against colybaeriosis and paratyphus at the age of 2-3 days, not only differ, but connected with each other. As the evident confirmation of this fact can serve as the fact that in both cases there is prevailed the high immune colybaeriosis agglutinins of lambs, vaccinated against colybaeriosis and paratyphus from the age of 2-3 weeks is the absence of parabolic character of immune reaction to the vaccination, which tells about its ineffectiveness at this age.

Due to the fact that in experiments, conducted on the vaccinated lambs at the age of 2-3 days, there was got the paradoxical result in the form of post vaccinal falling and separate raising of titles of specific agglutinines, there appeared the necessity of carrying out the experiments with other terms of vaccination. For this purpose there was studied the immunological structure of populations of Karakul sheep lambs vaccinated at the age of 2-3 weeks.

The immunological structure of populations of karakul sheep lambs, vaccinated against colybaeriosis and salmonellosis from the age of 2-3 weeks. A new experiment was carried out on 50 lambs for this purpose. They were also vaccinated against colybaeriosis and paratyphus, but the vaccination was carried out from the age of 2-3 weeks, which has given absolutely different result. As the results of this experiment have shown, the immune reaction on the vaccination was more expressive and had brightly expressive parabolic character. In reality in this case the growth of the title of agglutinins against salmonella antigens was reserved but more protracted (Table 2).

Table 2. The dynamics of title of specific and normal agglutinins in the serum of blood of karakul – sheep lambs, vaccinated from the age of 2-3 weeks against colybaeterius and salmonellosis (M±m)

№	The spectrum of agglutinins	The age (in weeks) and the quantity (n =) of lambs		
		3-4 (n=50)	5-6 (n=40)	10-11 (n=30)
1	Coly agglutinin	1:125±1,58	1:565±3,75	1:215±2,67
2	Salmonella agglutinin	1:70±1,18	1:125±1,76	1:175±2,41
3	Haemo agglutinin	1:16±0,56	1:80±1,41	1:150±2,23

The results of experiments on the study of immunological structure of karakul – sheep lambs, vaccinated against colybaeteriouses and paratyphus from the age of 2-3 days and 2-3 weeks, there was revealed earlier unnoticed aspects of setting postvaccinal immunity of new born lambs, which touched the conceptual sides of immunology. In the light there appeared the necessity of deeper checking up the arising of a new concept on the setting of new concept on formation of immune status against microbial surrounding of new – born lambs, which as it is known, are conditionally – pathogenous microorganisms.

The fundamental question of this problem has become the revealing the nature of wavelike character of immune reaction of organism of newborn lambs to the vaccination.

The wavelike immune reaction of newborn lambs, vaccinated from the age of 2-3 weeks, which allows to make supposition that, beginning from the second half of the month of postnatal life, there are turned on the mechanism of active supposition synchronically with this unknown factor on the 2-3 week of postnatal life, the lambs were immunized with rarely met in nature bacterial antigen as such an immunogen there was chosen the sterile soluable anthrax.

The immunological structure of the population of Karakul sheep lambs, vaccinated from the age of 2-3 weeks with anthrax antigen. The experiments were conducted on 50 newborn lambs. The lambs were vaccinated with sterile soluable anthrax antigens in ampoules, used for positing the reaction of Askoly. The antigen was injected once hypodermically into hip. The doze of antigen is 1 me.

As the results of the experiment show (table 3) in this case are also produced specific and normal antibodies against colybaeterias, enterococcs and heterological erythracitar antigens that is agglutinins and precipitins in wavelike form.

Table 3 . The dinamics of the level of specific and normal antibodies in the serum of karakul – sheep lambs, immunizing from the age of 2-3 weeks with soleable anthrax antigen (M±m)

№	The spectrum of agglutinins	The age (in weeks) and a quantity (n =) of lambs				
		3-4 (n=50)	5-6 (n=50)	7 – 8 (n=50)	9-10 (n=50)	11-12 (n=50)
1	Coly agglutinine	1:185±1,92	1:60 ±1,09	1:350 ±2,64	1:745±3,86	1:2425±6,96

2	Enterocock precipitine	0,88±0,13	1,25 ±0,15	1,13 ±0,15	1,26±0,15	- -
3	Anthrax precipitine	1:10±0,44	1:8±0,40	1:8±0,40	1:10±0,44	1:5±0,31
4	Haemo agglutinine	1:26±0,72	1:30 ±0,77	1:14 ±0,52	1:40±0,89	1:49±0,98

The data of table 3 show, that the title of colyagglutinines of lambs falls by 5-6 weeks in comparison with the previous age and during all the following period of researches there was a sharp raising.

The analogous fallings and raisings were characteristic both for the font of immunodiffusion of anti-enterococccous presipitines.

However the falling and raising of antibodies in these cases by the time fell behind from the previous time, so the falling was registered on 7-8 weeks, then there followed the statistically authentic raising.

These results essentially confirmed earlier obtained data of the previous series of experiments.

The results were new for the immune reaction on the sterile soluble anthrax antigen. After registration of quick response to the infection of anthrax antigen in a week after vaccination, that is of lambs of the age of 3-4 weeks, there followed the same falling of anti-anthrax presipitines, which was more protracted and was observed at 5-6 and 7-8 weeks old lambs, that is during about a month. But it was unexpected that in 1,5-2 months after vaccination there was registered the second raising of title of anti-anthrax presipitines in the serum of blood of experimental lambs, which can't be considered as an immune response to the injected antigen.

However, it cannot be considered and is not connected with immunization of anthrax antigen. It is still the most probable assumption, that the second wave of the raise of the title of anti-anthrax presipitines is the immune response to anti-idiotypical antibodies, imitating the immunogen properties of anthrax bacterial antigens. Actually, the same thing is testified disconnected character falling of the title of anti-anthrax presipitines on the 11-12 weeks of postnatal life.

Disconnected character of the wavelike immune reaction of organism of newborn lambs anthrax antigen on comparison with others studied immune responses is explained to our point of view that nature bacterial antigens and anti-colostral anti-iditypical antibodies, imitating bacterial antigens in organism are accumulated and reduced gradually.

It cannot be said in the respect of accumulation of antibodies against single moment injected antithrax antigens, produced as a result of corresponding anti-iditypical antibodies. Namely the latters, to our mind, cause the second wave of raise of the title of reaction Askoly, imitating anthrax antigens.

One more important result of this experiment is the determination of the nature of wavelike immune reaction on conditionally – pathogenous microorganisms, which is not the result of vaccination, but natural phenomenon.

Synchronity of waves of immune reaction to anti-colostral anti-iditypical antibodies, presenting conditionally – pathogenous microorganisms and injection of anthrax antigens to

lambs of the age of 2-3 weeks, there was revealed the new nature of formation of active immunity both in natural conditions and at vaccination.

4. THE DISCUSSION

The results of experiments on the study of immunological structure of populations, vaccinated against colybaerious, paratyphus and anthrax of lambs, allowed us to reveal a number new immunological phenomenons not described in available for us scientific literature.

The main of them, to our mind, is that from the very beginning of postnatal life of animals there was formed the strong immune status against inflectional origin of microbiological surroundings, in which formation the colostral antibodies served as initial material and determining base. During the first month of postnatal life the colostral antibodies form the immune status against microbial surrounding in the form of passive immunity.

However in the future, beginning from the age of 2-3 weeks there begins elaboration of anti-idiotypical antibodies against colostral antibodies, which accumulate and modify and begin to render the antigen influence, imitating the properties of corresponding bacterial and virus antigens and determine the formation of active immune status against inflectional origin, notwithstanding the contacting or uncontacting of organism of newborn lamb with this or that antigen of microbiological surrounding.

Besides, it may be supposed, that michanisms of regulation of antitelogenesis against conditionally pathogenous and acutepathogenous microorganisms have their own peculiarities.

5. CONCLUSIONS.

Thus, it can be made a conclusion, that at lambs there is formed first passive and then active immunity against studied conditionally – pathogenous inflectional origin. The dynamics of formation of immune status has a wavelike character.

The first maximum of this immune status, registrated during 1-2 weeks of postnatal life, by its nature is passive, that is of colostral origin.

The second maximum of immune status, registrated during 5-8 weeks of postnatal life, is by its nature active, but determined by colostral immunity, that is both these peaks of wavelike immune reaction are interconditioned.

The participation of antigen pressure of microbial surrounding in the formation of immune status takes place synchronically with anti-idiotypical antibodies, but the first wave of title of antibodies has mainly anti-colostral – anti-idiotypical nature.

The anti-colostral – anti-idiotypical and antimicrobial immune reactions of organism of newborn lambs are on the base of formation of natural immune status against conditionally – pathogenous microorganisms and serve as the measurement of withstanding of pathogenity of microorganisms.

The results of our researches show, that anti-idiotypical antibodies fulfill the immunomodeling role regarding the microbial surrounding of animals.

6. REFERENCES

- [1] Abdullaev M.A., Ruzikulov R.F. Immunity of the organism of farm animals against conditionally-pathogenic microorganisms. // "Izvestia" magazine of the Armenian Agricultural Academy. - Yerevan, 2004. -№ 4, p.p. 60-61.
- [2] Beduleva L.V., Menshikov I.V. Dysregulation in the idiotypic set // Immunology. - Moscow, 2008.-№ 4, p.p. 214-216.
- [3] Dumova V.V. Peculiarities of immunodeficiencies of cattle //Veterinary. – Moscow, 2006, -№ 9, p.p. 17-18.
- [4] Jeleznikova G.F. Infection and immunity: the strategy of both sides // Immunology. – Moscow, 2006. -№ 6, p.p. 597-614.
- [5] Kennedy R.S., Melnik D.L., Dryzman G.R. Anti-idiotypes and immunity // Journal. In the world of science. - Moscow, 1986. -№ 9, p.p. 24-33.
- [6] Lvov D.K. The problems of unregistered and unpredictable infections //Journal of microbiology, epidemiology and immunology – Moscow, 1997. -№ 4 p.p. 104-114.
- [7] Mishchenko V.A., Yaremenko N.A., Gusev A.A., Getmanskyy O.I., Suleimanov S.M. Some aspects of the pathogenesis of diarrhea in newborn calves // Veterinary medicine. - Moscow, 1999. -№ 9, p. 20.
- [8] Petrov R.V., Khayitov R.M., Oradovskaya I.V. The immunological monitoring of large groups of population of the country. //Immunology. - Moscow, 1992. -№ 4, p.p. 43-52.
- [9] Seytkhanova B. Formation of the microflora of the newborn // Animal health. - Tashkent, 2008. -№ 5, p.p. 34-35.
- [10] Fedorov Yu.N. Immunodeficiencies of cattle // Veterinary medicine. - Moscow, 2006. - № 1, p. 3.
- [11] Frolov A.F., Zaritskiy A.M., Feldman Yu.M. Once more about the conditional pathogenicity of microorganisms //Journal microbiology, epidemiology and immunology -Moscow, 1999. -№ 5, p.p. 96-98.
- [12] Avrameas S., Ternynck T. Natural auto antibodies: the other side of immune system //Immunology. - 1995. - Vol. 146. – p.p. 235-248.
- [13] Kennedy J.R. Reactive arthritis the result of an anti-idiotypic immune response to a bacterial lipopolysaccharide antigen where the idiotypic has the immunological appearance of a synovial antigen //Med. Hypothes. - 2000. - Vol. 54. - P.723-725.