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The Frequency Of Perinatally Significant Bacterial Infections In Pregnant Animals.

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ABSTRACT

Intrauterine infection is a relevant cause of high reproductive losses and incidence of newborns. A high percentage of diagnosis of intrauterine infections in pregnant agricultural and domestic animals is growing steadily. Undoubtedly, this fact leads to an infectious and inflammatory pathology, which is already 20-38% of all diseases of newborn animals. The high level of functional reserves of the pregnant organism is of great importance in the prevention of intrauterine infection. Infection in the prenatal period of development affects the growth and development of the fetus on the one hand, and on the other hand, the maternal organism is isoimmunized with fetal antigens, accompanied by an increase in the sensitivity of the organism with the predominant manifestation of cellular phenomena, in the absence of enhanced antibody synthesis. Given the high importance of the functional reserves of a newborn organism, intrauterine development and the usefulness of the placental barrier are important.

Keywords: intrauterine infection, immune-dependent pathology, immunopathological mechanisms, reactivity, sensitivity, pregnant animals.

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INTRODUCTION

The identification of carrier of an infectious agent in the inactive phase during pregnancy of a different gestational period should be considered from the standpoint of avidity and seropositivity of pregnant animals.

The inclusion of pregnant animals in the study program was expected by the following criteria:

- the absence of bacterial and viral infectious pathology (absence of antibodies negative PCR and negative bacteriological identification method Ch. trachomatis; Herpes simplex; Candida albicans; Staphylococcus aureus)
 - absence of abnormalities in fetal development;
 - favorable outcome of labor
 - no complications in the intranatal and early postnatal period.
- Control was a group of individuals without the aforementioned signs of the infectious.

MATERIALS AND METHODS

Evidence of a primary acute infectious infection was the detection of IgM antibodies in the absence of IgG. Seroconversion was considered at the value of the avidity index of IgG specific in the gray zone from 30 to 60%. High-grade IgG antibodies (with avidity index > 60%) and in the absence of IgM antibodies became the basis of a good immune response ie. asymptomatic infectious carrier. And when IgM antibodies and highly antibodies IgG (with an avidity index > 60%) were found, it was a reason to talk about reinfection and possible exacerbation of the infectious process.

According to the results of diagnostic studies in livestock farms of different forms of ownership, according to the statistical data of the epizootic department of the Veterinary Administration of the Stavropol Territory, the frequency of detection of carriers of pathogens of bacterial intrauterine infections was established. For a retrospective analysis of intrauterine carriage of perinatally significant infections, the following nosological forms were identified: Toxoplasma, Chlamydia trachomatis, Mycoplasma, Staphylococcus aureus.

RESULTS AND DISCUSSION

The highest level of antibodies (84.5%) demonstrates the presence of IgG antibodies to Chlamydia trachomatis. The second place is carried by the carriage of IgG antibodies to Mycoplasma, which is (71.2%). At the same time, the dynamics of the annual increment of these nosological forms is 12.8% and 11.2%, respectively (Table 1).

Table 1: Frequency of detection pathogens perinatally significant infections in pregnant animals for the period 2015-2017

Type of infection		Dynamics					Description of relative indicators		
		2013	2014	2015	2016	2017	Average (m ± o)	Rate of change	
								2013-2015	2015-2017
Toxoplasma	Total	146	154	227	253	287	172,9±1,74	+6,0%*	+8,5%
	%	282,6	285,8	266,1	257,3	272,7			
Chlamydia trachomatis	Total	178	189	252	308	346	207,2±9,76	+42,7%**	+128,5%**
	%	329,4	414,5	488,8	507,3	595,8			
Mycoplasma	Total	173	181	194	222	287	189,3±3,06	+15,5%**	+84,2%
	%	198,8	133,5	161,7	245,3	207,2			
Staphylococcus aureus	Total	156	161	191	190	197	53,2±1,15	+13,0%**	+21,7%
	%	60,2	67,1	70,2	73,3	76,2			
	%	160,2	227,7	239,7	208,9	218,8			
Number of pregnant animals		8723	8620	8298	9087	8929	-		

Explanations: * - meaningful at the level of p <0,05; ** -significantly at the level of p <0.001

Based on the results of infectious diagnostics (Table 2), the presence of IgG antibodies to Chlamydia trachomatis detection rate for the period 2013 - -2018. was 128.5%, and IgG antibodies to Mycoplasma 84.2%. Pathogens of these forms are intracellular pathogens capable of persistence while developing non-sterile immunity presenting a high risk of the pathology of the fetoplacental complex in the early prenatal period.

Table 2: The frequency of detection the antibodies to Chlamydia trachomatis in pregnant animals for the period 2013-2017

Type of antibody		Dynamics					Description of relative indicators		
		2013	2014	2015	2016	2017	Average (m ± o)	Rate of change	
								2013-2015	2015-2017
IgG seropositive	Total	178	189	252	308	346	207,2±59,76	+42,7%**	+128,5%**
	%	329,4	414,5	488,8	507,3	595,8			
IgM seropositive	Total	9	16	12	19	26	1,9±0,71	+39,3%	+182,2%*
	%	1,0	1,9	1,4	2,1	2,9			
^A-seropositive	Total	48	67	52	81	123	8,4±3,26	+54,5%*	+150,3%**
	%	5,5	7,8	6,3	8,9	13,8			

Leading positions in the rate of growth of pathogens Chlamydia trachomatis and Mycoplasma have their own peculiarities: a complex life cycle consisting of three components (reticular body, intermediate development, and mature cell-elementary body). Sterile immunity in animals with specific prevention of this disease is not observed, which is a significant threat to the development of the entire fetoplacental period during pregnancy. High dynamics over the past five years with an annual increase in seropositive pregnant women with IgM and IgG, increasing the numerical risk group for intrauterine infection.

Registration in pregnant animals of IgG antibodies to Staphylococcus aureus in 21.7% is of utmost interest, since highly-evolved antibodies are the result of a good immune response and a low risk of intrauterine infection of the fetoplacental complex, while not excluding relapse. Therefore, pregnant individuals with identified antibodies to Staphylococcus aureus become a risk group for susceptibility to intrauterine infection.

Table 3: Frequency of detection the antibodies to Toxoplasmosis of pregnant animals for the period 2013-2017

Type of antibody		Dynamics					Description of relative indicators		
		2013	2014	2015	2016	2017	Average (m ± o)	Rate of change	
								2013-2015	2015-2017
IgG high-facies: (IgM-; IgG>60%)	Total	246	246	220	233	243	232,8±1,69	+5,9%*	-3,5%
	%	282,5	285,7	266,1	257,3	272,6			
Seronegative: IgM(-); IgG(-)	Total	524	522	475	487	483	471,8±2,47	+1,1%	+3,9%**
	%	601,7	605,9	573,0	536,3	541,9			
IgG low-viscous: IgM(-); IgG<40%	Total	8	101	159	15	52	7,9±0,64	+252,8%*	+235,0%**
	%	0,9	11,7	19,2	1,7	5,8			
Seroconversion: IgM(-); IgG 40-60%	Total	16	8	72	80	52	5,2±1,71	-33,8%**	+207,5%**
	%	1,8	0,9	8,7	8,8	5,8			

Explanations: * - meaningful at the level of p <0,05; ** -significantly at the level of p <0.001

When assessing the rate of detection of antibodies to Toxoplasma among pregnant animals, a low percentage of seronegative individuals (3.9%) of the total number of subjects were identified.

Highly IgG antibodies to Toxoplasma are established between 2013 and 2018. had a small growth rate, this is the cause of intrauterine infection in the past. Significant interest is a sharp increase (+ 207.5%) for the period 2013-2015. pregnant women with seroconversion and (+ 235%) with low-like anti-bodies in the blood. This fact became the basis for the past contact and for asymptomatic carriage of the causative agent of persistent infection.

CONCLUSION

Despite the carriage of pathogens perinatally significant infections, violations from intrauterine infection are much more likely to develop with IgG antibodies to the causative agent (more than 43.8% of cases) and seropositivity in 57.2% of pregnancies. A high variety of clinical manifestations of intrauterine infection requires the development of minimally invasive antenatal and intrapartum prognostic methods that allow for not only the presence of an agent in pregnancy and/or childbirth but also the risk of fetal and newborn infectious disease, complications of the early neonatal period.

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