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Prospects for the Use of Therapeutic and Preventive Immunoglobulin in Veterinary.

Sergey Yurievich Smolentsev[1], Ellada Konstantinovna Papunidi[2], Valentina Pavlovna Korosteleva[2], Elena Lavrentevna Matveeva[2], and Galiya Rasihovna Yusupova[3].

[1]Mari State University, 1 Lenin Square, Yoshkar-Ola, Russia.
[2]Kazan cooperative institute (branch) Russian university of cooperation, 58 Ershova str., Kazan, Russia.
[3]Kazan Bauman state academy of Veterinary medicine, 35 Sybirsky Tract Street, Kazan, Russia.

ABSTRACT

The results showed that the application of therapeutic and prophylactic immunoglobulin marked elevation in the specific and specific resistance of the body of pigs and cattle, as well as the use of their young. The drug «Therapeutic and prophylactic immunoglobulins» can be used for: the prevention of immune deficiency, increasing natural resistance in diseases accompanied by a decrease in specific and nonspecific resistance, reduce morbidity and improve the safety of young pigs and cows.

Keywords: Resistance, prophylactic immunoglobulin, improved, safety, pigs, cows, young growth.

Corresponding author

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INTRODUCTION

Immunity is one of most important characteristics of all living organisms, created in the process of evolution. The immune system protects the body from infections [2;4;5]. Condition of the immune system, like any other body, is characterized by a complex of morphological, functional and clinical parameters pertaining to the immune system in normal conditions and they determine the immune status [1;3;12]. Change any one or more of these indicators show a violation of the immune status, its deviation from the norm and is treated as immune deficiency [7;9;10].

The problem of immunodeficiency is of interest to veterinarians at the steady growth of infectious and inflammatory diseases are prone to chronic course on the background of low efficacy of the basic therapy, bacterial and viral diseases, causing high morbidity and even mortality [6;8;11].

In this regard, the FGBU «Federal center of toxicological, radiation and biological safety» was synthesized by a new immunostimulant «Therapeutic and prophylactic immunoglobulin», derived from horse serum and representing the immunologically active protein fraction containing predominantly immunoglobulin G.

METHODOLOGY

Studies were conducted in a pig-breeding complex Skha «Iskra» Kuzhenerskogo area and farm cattle «Ltd Dairy Products» of the Soviet district of the republic of Mari El. The experiment was conducted on pregnant sows and calve respectively. The drug was injected intramuscularly at the rate of 20 ml per animal, twice with an interval of 48 hours for 30 days before delivery. As blood levels of immunoglobulin A, M, G analyzer «Uniplan». Number of T-lymphocytes in the blood were determined by spontaneous rosette with sheep erythrocytes, B-lymphocytes - method of complementary assay using a standard rabbit hemolysin and as a complement - fresh serum of cows. Bactericidal activity of blood serum was determined by O. Smirnova and T.A. Kuzmin, lysozyme - by K.A. Kagramanova and Z.V. Ermolevoy, phagocytic index and number - by V.S. Guest room.

MAIN BODY

Experience in sows. In experiments with sows was found that the 15-day levels of immunoglobulin A was 2,57±0,06 mg/ml, immunoglobulin M - 3,86±0,13 mg/ml, and G - 16,35±1,09 mg/ml (p<0,001). On the 45 th day of their content was higher (p <0,001), the background rate, respectively, 94,4% 45,8% and 33,7%. To the 60-th day of immunoglobulin A level was 2,85±0,09 mg/ml, immunoglobulin M - 3,88±0,10 mg/ml, and G - 18,55±2,15 mg/ml (Figure 1). In the control group of sows level of immunoglobulin A, M and G did not change significantly during the entire experiment.

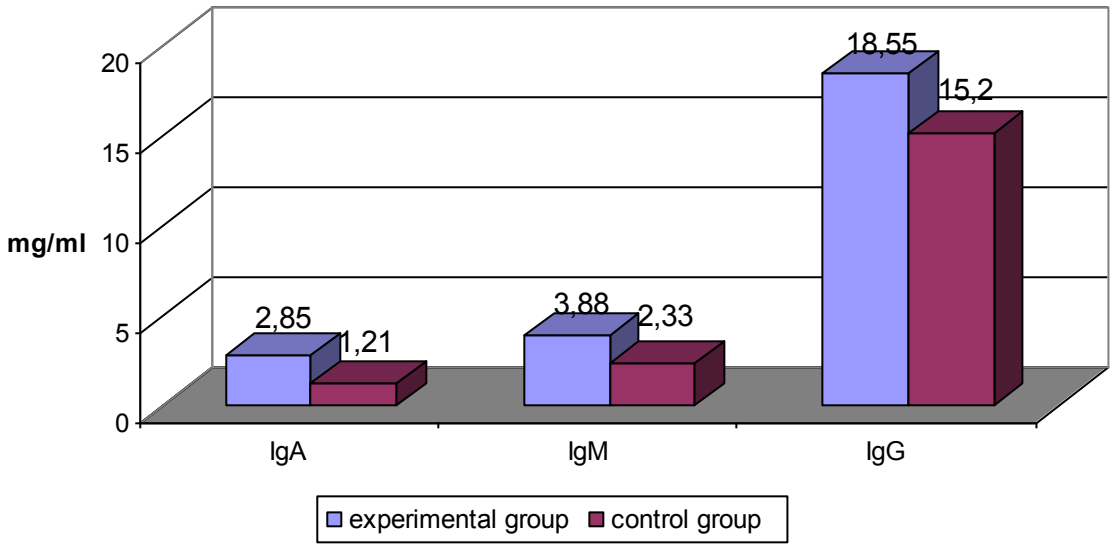

Figure 1: Content of immunoglobulin's in blood serum of sows

Bactericidal activity of blood serum was significantly improved (p<0,001) at the 15 the day of 1,27 times. At the 60-day study the bactericidal activity of blood serum in the experimental group was 25,8±1,60% (p<0,001) and in control 16,7± 1,01%. It was noted raising lysozyme activity of blood serum. On the 60 the day of its level was higher than the background rate of 1.92 times (p<0,001).

The 60-day study phagocytic number and phagocytic index were significantly (p<0,001) above background values of 118 and 58,6% respectively.

The relative level of T-lymphocytes was significantly (p<0,001) increased by 15-day research in the first group in 1,1 times in comparison with the original data. On the 45 the day of this level was in the experimental group 69,3±2,00%. At the 60-day relative level of T-lymphocytes was significantly (p<0,001) above the background rate in the experimental group in 1,25 times.

The absolute level of T-lymphocytes also significantly increased (p<0,001) and reached the 60 the day of 3,78±0,08×10^9/ l. What in turn higher than the background index at 70,2%. Relative and absolute levels of B-lymphocytes were at the 60 the day of 29,3±1,66% (p<0,001) and 1,49±0,14×10^9/l (p<0,001), respectively.

In the control group, both relative and absolute levels of T and B lymphocytes did not change significantly. The relative level of T-helper cells increased 1,13 times (p>0,05). On the 60 the study the relative level of T-helper cells was 43,1±1,60% (p<0,001). The absolute level of T-helper 60-day studies was significantly higher (p<0,001), the background rate of 1,39 times.

The relative and absolute levels of T-suppressors also significantly increased (p<0,001) in all experimental groups. Thus, at the 60 the day of their levels in the experimental group were 24,5±1,08% and 0,97±0,03×10^9/l, respectively. And in the control group, relative and absolute levels of T-suppressors was 16,1±0,70% and 0,63±0,03×10^9/l.

Experience with the cows. In a study on the cow in calf, it was noted that the content of immunoglobulin A was significantly increased at day 15 by 21,2% (p<0,01). At the 45 the day of research, the level was 2,35±0,02 mg/ml (p<0,01). At the 60-day maintenance of immunoglobulin A were higher (p<0,01) of the original data in the first group to 20,1% (2,21±0,03 mg/ml).

And in the control group, their level was 1,86±0,04 mg/ml. The concentration of immunoglobulin M in the serum of cows on the 60th day, increased by 28,5%.

A similar pattern was observed in the analysis of the content of immunoglobulin G in blood serum. Their level by the end of the study was 18,18±0,54 mg/ml (p<0,001). In the control group, the content of immunoglobulin M and G was a 60-day 2,30±0,05 mg/ml and 16,95±0,33 mg/ml (Figure 2).

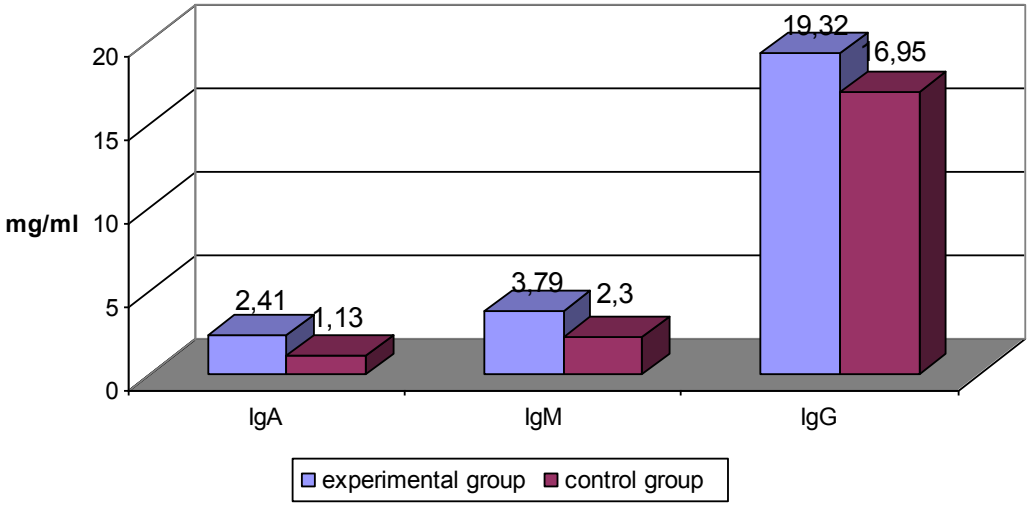

Figure 2: Content of immunoglobulin's in blood serum of cows

Bactericidal and lysozyme activity of blood serum significantly increased during the entire study (p<0,05). Thus, the bactericidal activity of blood serum amounted to 60-day 48,09±1,19%. A lysozyme activity of blood serum was 40,06±0,99%, which is higher than the background rate of 1,14 times.

Phagocyte number significantly (p<0,05) increased at the 15 th day of 6,7% (48,11±1,44). At the 60-day research phagocytic number was in the experimental group 48,24±1,32 (p<0,05). Phagocytic index also increased and amounted to a 60-day studies 4,26±0,09 (p<0,01), while in the control group, phagocytic index and phagocytic number and remained at low levels.

Relative number of T-helper cells at 15 days in the experimental group increased compared with the background figure of 1,13 times (p<0,01). On the 45th day their number was 64,6±3,85% (p<0,01). On the 60th day of studies on the number of T-helper cells was higher than the background rate of 1,18 times (p<0,001).

The absolute number of T-helper cells also increased in the experimental group on the 60th day compared with the background rate in the European emission band in the 1,20 fold (p<0,001). Relative number of T-suppressors for 15 days increased in the first group in the 1,13 times (p<0,05). On the 60th day of their level was above the background rate of 1,27 times. The absolute number of T-helper cells also increased the absolute number of T-suppressors on the 60th day was significantly (p<0,001) above the background rate in the first group at 1,38 times (0,90±0,14×10^9/l).

In the control group, absolute and relative number of T-helper and T suppressor has remained low throughout the experiment. The absolute number of T-lymphocytes was higher (p<0,001) on the 60th day compared with the control group at 1,31 times.

The relative number of B-lymphocytes by the 15th day was 30,7±2,03% (p<0,01). At forty-fifth day of their number was higher than the background rate in the first group to 1,35 times. On the 60th day their number was 37,5±0,91% (p<0,001). The absolute number of B-lymphocytes in 60th day was higher than the initial target of the first group at 1,34 times (p <0,01).

In the control group of cows relative and absolute

number of B-lymphocytes was on the 60th day, respectively 25,5±0,19% and 0,99±0,02×10^9 /l. Preservation of calves obtained from the experimental groups was 100% in whereas in the control group died three calves out of 10, and their preservation was 70%.

CONCLUSION

The studies showed that the application of therapeutic and prophylactic immunoglobulin was an increase of cellular and humoral immunity in the sows and cows, and also have received from them offspring.

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