



METHAPHYLACTIC EFFECTIVENESS OF COMBINATION OF ANTIBIOTIC DRUGS, BIOLOGICAL ACTIVE SUBSTANCES AND VITAMIN „C” IN WEANED PIGS IN FARM WITH PROVED CO-INFECTION OF PRRS, PCVI, APP AND COLIBACTERIOSIS

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ABSTRACT

In swine complex with proved co-infection of porcine reproductive and respiratory syndrome (PRRS), porcine circovirus infection (PCVI), actinobacillus pleuropneumonia (APP) and colibacteriosis (CB), manifested with increased mortality in weaned pigs was tested scheme of metaphylactic treatment with combination of antibiotic drugs and biological active substances (group I) and supplement of vitamin „C” (group II). The scheme provides one course of treatment with combination of antibiotic active against *E. coli* (Nipoxim 40 - premix in dose 1.5 kg/t), tanin from sweet chestnut (Farmatan, in dose 3.0 kg/t) and antimycotoxic drugs (Mycofix-plus, in dose 1.5 kg/t), given with the feed in course of 14 days and after break of 10 days, second course of treatment with florfenicol (Feniveex premix - 2 %, in dose 2.0 kg/t), active against the bacterial respiratory and gastrointestinal diseases, given also with the feed in course of 5 – 7 days. This combination as group I and with supplement of vitamin „C” (Rovimix C – EC, by 0.4 kg/t) during the firstly 14 days, as group II, was compared in 4 turns trials. It was found, that the combination with supplement of vitamin „C” protected better the weaned pigs from the enumerated diseases and bring off decreased of average mortality in comparison with the control group from 2.82 % to 1.57 % or with 1.25 % less.

Key words: pigs, co-infection, metaphylactics, antibiotics, biological active substances, vitamin C

INTRODUCTION

The virus of porcine reproductive and respiratory syndrome (PRRSV) cause infection, included prolonged viremia, replication in the macrophages and persistence infection, manifested by reproductive disorders in sows and respiratory difficult in the young pigs (1; 2). The information about connection of porcine circovirus 2 (PCV-2) with porcine respiratory disease complex (PRDC) (3; 4) already is collected. The damage of porcine alveolar macrophages (PAMs) of PRRS and PCV 2 increased susceptibility of macroorganisms to etiological agents of bacterial pneumonia (2; 5). Halbur (6) determinate *M. hyopneumoniae*, *A. pleuropneumoniae* и

Bordetella bronchiseptica (B.bs), as firstly bacterial agents of respiratory diseases and others as secondary and as septicemic. Now is know, that PRDC is result from combination of multitude agents, environment, stress and mistakes of management. For decreased of negative effects of such co-infection is recommended an complex of measures, but and in the best management the pigs remain sensitive to bacterial infection, because the used of antibacterial drugs will remain indivisible part of measures for control of the clinical manifestation of the infection diseases (7). The till now experience show, that much of used antibacterial drugs already are exhaust their possible because quickly build resistance of the microorganisms to them, that require especial attention in selection of

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antimicrobial and alternative to them means (8). The aim of this trial was to examine the methaphylactic effectiveness of combination from antibacterial drugs, tannin, antimycotoxin means and vitamin „C” in pig farm with proved co-infection of PRRSV, PCV-2, *A. pleuropneumoniae* and *E. coli*.

MATERIAL AND METHODS

The trial was carry out in pig farm with good menagement and profilactic program, included vaccination against leptospirosis, colibacteriosis (CB), rhusiopathia suum, parvovirus and PRRS (with inactivated vaccines). Weaned pigs are consummate with starter forage, which during firstly 10 - 14 days is medicate with antibacterial drugs. The mortality in group decreased under 4 %, but in separate batches was registered clinical manifestation of respiratory and gastrointestinal diseases, in result of that affected animals quickly reduce body weight and drop. Through complex clinical and laboratory examination we found simultaneous running of PRRS, PCVI, APP and CB and we applied scheme for methaphilactic treatment of weaned pigs.

I. group - control („Scheme A”)

1. From Ist to 14th day after weaning: - Colistin (Nipoxim 40 – premix, 1.5 kg/t forage), Tannin (Farmatan, 3 kg/t forage), Antimycotoxic drugs (Micofix pluse 3.0, 1.5 kg/t forage)
2. From 25th to 30th day after weaning: Florfenicol (Feniveex premix, 2.0 kg/t forage or 40 ppm)

II. group – trial („Scheme B”)

1. From Ist to 14th day: - Nipoxim 40 – premix, 1.5 kg/t forage, Farmatan, 3 kg/t forage, Micofix pluse 3.0, 1.5 kg/t forage, Vitamin „C” – as Rovimix C – EC, 0.6 kg/t forage
2. From 25th to 30th day after weaning: - Feniveex premix, 2.0 kg/t forage.

The batches weaned pigs divided of two groups, from that the one treated by „Scheme A”, and another by „Scheme B”. The clinical status of animals registered till transfer in group for fattening, and of the dead pigs was carry out postmortem examination and bacteriological tests.

RESULTS

The results from carry out comparative examination are show of table 1. From dates of the two groups, as and from received differences between them, is clarity that

registered co-infection of PRRSV, PCV-2, *A. pleuropneumoniae* and *E. coli* is manifest mostly with conjunctivitis, sneezing, diarrhea, white of the skin and the mucoses and dead of the pigs. In Ist group the illness pigs with conjunctivitis and respiratory difficult is moved in the borders from 6.92 to 12.46 % till in IInd group, received and vitamin „C”, the animals with such clinical signs are from 1.14 to 7.0 %. Other clinical sign, characteristic of PCVI - bleach of the skin and the hairs, was registered in the 2nd, the 3th and the 4th trial and affected in Ist group from 2.5 to 4.32 % of the pigs, and in IInd group from 0.98 to 3.42 % or average with 1 – 2 % lower. Generally in the four trials, from the control group declined from 2.43 to 3.10 % of the pigs, or average 2.82 %, and from the trial group - from 1.0 to 1.97 %, average 1.57 %, which is with 1.25 % less.

DISCUSSION

From the analysis of the results of diagnostic examination, we concluded, that in group of the growing pigs running severe co-infection, in the etiology of that take part 2 viral and 2 bacterial agents. Because that the PRRSV and the PCV-2, except evidentes clinical sings, reduced strongly the alveolar and endothelial macrophages, that increased sensitivity of the macroorganism to some bacterial pathogens, such as in the case are *A. pleuropneumoniae* and *E. coli* (1, 3, 4, 6, 9). In result of this interaction the condition of weaned pigs is worsen strongly and after 20th day from weaning much of them declined, as the mortality in separate batches is moved from 13 to 27 %. This position us compel to make and examine effective prophylactic scheme (A), with application of that after several months success to govern the disease and to decreased the mortality in the group to acceptable level. For successful of this scheme pledged of several important moments: a) quickly and exactly diagnosis, b) good chosen moments and time for treating of the pigs, c) successful chosen means for prophylaxis and therapy. The addition of farmatan, representing extract of tannin from sweet chestnut, increased the resistance of the pigs, that for condition of immunosuppressia is very important and reduced in considerable degree the gastroenteritis, and in combination with antibiotics ensure obtaining and higher average daily gain (10). In order to avoid harmful influence of the difference mycotoxins, towards the ration of the pigs we

included and Micofix-plus 3.0. By virtue of this combination, as before, so and by time of this experiment, success to eliminate bacterial disease (APP, CB and others), participators in co-infection and to neutralized to a great degree the acute running of viral infection and strongly consequences from the immunosuppressive influence. Independent of this, clinical signs and mortality of PCVI was registered, that necessitate expanded of the scheme with vitamin „C” (scheme B), which is

recommended in case of infection diseases (11). By reason of this we its accept as drugs, that perhaps to neutralized to a certain degree pathogenic effect of PCV-2. This expectation is justify and in II group was received better results and in the four serial trial, as in respect of clinical manifestation, such as and for the registered mortality. The received results are in compliance with recommendations of Firkins (7) for measures in the cases of registration co-infections.

Table 1. Results from the methaphylactic treatment of weaned pigs with combination of antibacterial means, biological active substance and vitamin C

Trial №	Indexes	I gr. - control		II gr. – experim.		Diferens +/-
		Num.	%	Num.	%	
1.	Weaned pigs	329	100	300	100	-
	Clinical manifestation:					
	- coniunctivitis + sneezing	41	12.46	21	7.0	- 5.46
	- chemorrhagic ileitis	1	0.15	-	-	- 0.15
	Dead pigs	8	2.43	3	1.0	- 1.43
2.	Transfer of pigs in fattening	321	97.57	297	99.0	+ 1.43
	Weaned pigs	387	100	356	100	-
	Clinical manifestation:					
	- coniunctivitis + sneezing	34	8.8	24	6.7	- 2.1 %
	- pallor of pigs	19	2.5	8	1.1	- 1.4 %
3.	- diarrhea (fusariotoxicosis)	21	2.75	17	2.39	- 0.36 %
	Dead pigs	12	3.10	7	1.97	- 1.13 %
	Transfer of pigs in fattening	375	96.90	349	98.03	+ 1.13 %
	Weaned pigs	347	100	322	100	-
	Clinical signs:					
4.	- coniunctivitis + sneezing	24	6.92	16	4.97	- 1.95
	- pallor of pigs	15	4.32	11	3.42	- 0.90
	Dead pigs	10	2.88	6	1.86	- 1.02
	Transfer of pigs in fattening	337	97.12	316	98.14	+ 1.02
	Weaned pigs	-	-	612	100	-
Ave- rage	Clinical signs:					
	- coniunctivitis + sneezing	-	-	7	1.14	-
	- pallor of pigs	-	-	6	0.98	-
	Dead pigs	-	-	9	1.47	-
	Transfer of pigs in fattening	-	-	603	98.53	-
Ave- rage	Weaned pigs	1063	100	1596	100	-
	Dead pigs	30	2.82	25	1.57	- 1.25
	Transfer of pigs in fattening	1033	97.18	1565	98.43	+ 1.25

CONCLUSIONS

1. In farm with proved co-infection of PRRSV, PCV-2, *A. pleuropneumoniae* and *E. coli*, the application of „Scheme A” for methaphylaxis of the pigs from 1st to 14th day of the weaning with combination of antibiotic (Colistin), biological active substance (tannin) and antimycotoxic drugs (Micofix pluse) and from 25th to 30th day with other antibiotic (Florfenicol), reduced strongly clinical manifestation of the separate diseases and lead to decreased of mortality in grower pigs under 4 %.

2. The comparative examination of „Scheme A” and „Scheme B” in four sequence trials show, that from „Scheme B” is received better effect, expressed in decreased of clinical manifestation of gastrointestinal and respiratory diseases and decreased of average mortality with 1.25 %.

REFERENCES

1. Done, S. H. Porcine reproductive and respiratory syndrome (PRRS). Pigs Special, Respiratory diseases, Misset – June, 12 – 15, 1995
2. Done, S. and D. Paton. Porcine reproductive and respiratory syndrome: clinical disease, pathology and immunosupresion. Vet Rec. vol. 136, 2, 32 – 35, 1995.
3. Harding, J., E. Clarc. Recognizing and diagnosis Post-Weaning Multisystemic Wasting Syndrome (PMWS). Swine Health and Production, 5, 5, 201 – 203, 1997.
4. Harms, P., P. Halbur, S. Sorden. There cases of porcine respiratory diseases complex associated with porcine circovirus type 2 infection. J. Swine Health Prod., 10, 33-38, 2002.
5. Galina, L. Possible mechanisms of viral-bacterial interaction in swine. Swine Health and production, 3, 9 – 14, 1995.
6. Halbur, P. G. Porcine respiratory disease complex. Proc. of the North Carolina Healthy Hogs Seminar (N. Carolina. Swine Vet. Group), 1-14, 1999.
7. Firkins, L. D. Porcine respiratory disease complex. Swine Vet. Group, Proc. of the North Carolina Healthy Hogs Seminar 03.12.1999, 18-20, 1998.
8. Binek, M., U. Wojcek, Z. Szykiewicz, T. Jakubowski. Proc. 13th IPVS Congress, Bangkok, 1994.
9. Sorden, S. D., P. A. Harms, T. Sirinarumitr, I. Morozov, P. G. Halbur, K. Yoon, P. Paul Porcine circovirus and PRRSV co-infection in pigs with chronic bronhointerstitial pneumonia and lymphoid depletion: An emerging syndrome in Midwestern swine. In Proc. of the Annual Meeting of the Am. Assoc. of Vet. Lab. Diagnosticians. A.A.V. L. D., Minneapolis, Minn, 1998.
10. Yordanov, S., K. Ganchev, G. Kitanova, D. Petlov. Comparative examination of Farmatan for prophylaxis of bacterial enteritis in early weaned piglets. Vet. Medicina, Vol. VII, № 3-4, 55-59, 2001.
11. Drumev, D. Ascorbinic acid, Vitamin C - acidum ascorbinicum (FH). Veterinary Pharmacology, State Publishing hause, Zemizdat, Sofia, 342 – 344, 1975