TOPICALITY OF THE INTRAVITAL DIAGNOSIS OF OLLULANOSIS IN PIGS

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ABSTRACT

Swine ollulanosis is a parasitic disease caused by the nematode *Ollulanus suis* and is accompanied by a stomach disorder, inflammatory processes of the mucous membrane, which lead to the development of predominantly chronic forms of gastritis. As a result of the latter, the conversion of feed to diseased animals is reduced, which does not allow completely realize their genetic potential and damage of the pig industry. Coprological routine methods for the diagnosis of ollulanosis in pigs are ineffective, so in this study we have developed and tested new methods for lifelong diagnosis. In the 2016-2017 years, the effectiveness of three intravital methods of diagnosis ollulanosis was tested: gastric lavage of pigs, gastric mucus selection with the aid of a self-developed probe, and the selection of biopsies of the gastric mucosa using gastroscope. Obtained, using all three methods, samples were thoroughly examined under a microscope to detect and calculate nematodes *Ollulanus suis*. According to the results of researches of 192 heads of pigs from the farms of the Kiev region, we established the presence of *Ollulanus suis* in the stomachs of 108 animals (55,1%). Among the life-time diagnostic methods, the best results were the study of gastric mucosal biopsies and gastric mucus samples, which allowed detecting 89.6 and 86.8% of diseased animals, respectively. The least effective was gastric lavage, only 38.3% of the affected animals were found. It was also found to increase the intensity and severity of the disease in pigs with age.

Key words: *Ollulanus suis*, intravital diagnosis, pig

INTRODUCTION

The problem of pigs' ollulanosis has now become tangible, since the disease is common in pork production farms and leads to significant economic losses due to reduced reproductive capacity and suckling of sows, delayed growth of young animals, loss of weight in adult pigs, increased susceptibility to diseases of other etiology and death of pigs. [1] Data from other researchers in literature [2] indicate an increase in the incidence of swine disease in ollulanosis. Yet, this helminthes is mostly left out of the attention of specialists in veterinary medicine. This is due to the fact that little studied the issue of his intravital diagnosis [3], the development of new techniques which became the goal of our work.

MATERIAL AND METHODS

The research was conducted in 2016-2017 on the base of parasitological laboratory of the Bila Tserkva National Agrarian University, the farms producing pork from the Kiev region and the meat processing plant "Polis" (Bila Tserkva). Investigation of pigs and sampling for detecting presence of *Ollulanus suis* were carried out after a 12-hour hungry diet using three methods: gastric lavage, gastric mucus sampling by means of sensing, and selection of biopsy samples from the bottom of the stomach with gastroscope. The gastric lavage of the pigs was carried out with warm water using a rubber probe diameter of 15 mm, parallel massage of the abdominal wall in the stomach area and suction of water with Janet's syringe. The second diagnostic technique was to select samples of mucus from the stomach of pigs using a probe developed in the parasitological laboratory of the Bila Tserkva NAU. The probe is made of a polymer hose with an outside diameter of 15 mm and a length of 1,3 m. At a distance of 20 mm from the end, at an angle of 40°, two 120 mm long cracks connected to the probe hole. After the probe was inserted into the stomach, the probe was scrolled 25-30 times. Such manipulation provided the sampling of mucus from the organ. The mucus thus obtained was examined under a microscope for the detection *Ollulanus suis* (Fig. 1). The use of gastroscope "Puchok MT-11" (Fig. 2) was performed on pigs in a lying position on the left side, were selected samples biopsies of the gastric mucosa in a volume of 0.5 cm3, in parallel assessing the degree of inflammation in the stomach of pigs. All animal studies were conducted under thiopental anesthesia (10 mg / kg) in combination with neuroleptic (acepromazine 0.5 mg / kg).

The effectiveness of new methods for intravital diagnosis of ollulanosis was evaluated in 98 sows and compared the findings with the results of post-mortem examination of the sows' stomach. The age dynamics of the swine lesion by nematode *Ollulanus suis* was studied in 192 pigs of different age and technology groups according to the results of post-mortem examination of the stomach of pigs.

RESULTS

Indicators of efficacy for intravital studies of pigs for ollulanosis are given in Table 1. Thus, the effectiveness of the methods was: 1st – 38,3%, 2nd – 86,8 and 3d method – 89,6% in comparison with post-slaughter outcomes.

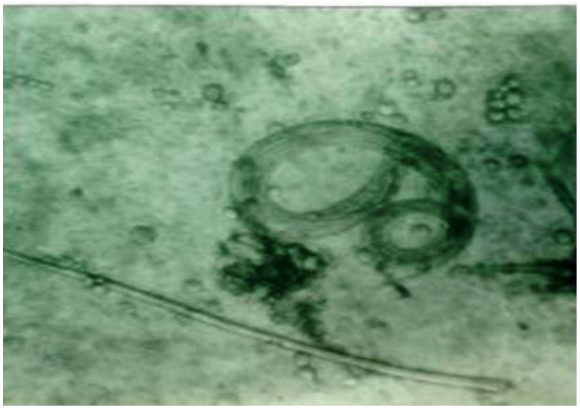

Fig. 1 – *Ollulanus suis* in gastric mucus

Fig. 2 – Selection biopsy samples gastric mucosa by gastroscope "Puchok MT-11"

There was a direct correlation between the level of effectiveness of diagnostic methods and the degree of invasion of sows, which were conventionally divided into three groups with low (397,6 ± 37,0), average (846,3 ± 16,89) and high (1525,2 ± 83,67) degree of invasion.

Table 1. Efficiency of intravital methods for diagnosis ollulanosis in sows

Group of animals depending on the degree of invasion.	Number of animals	Level of effectiveness of diagnostic methods in comparison with post-mortem examination, %			Level intensity of invasion by results of post-mortem examination (ex. / animal)
		stomach lavage,	sounding with selection of gastric mucus	Selection biopsy samples gastric mucosa by gastroscope	
1 group (low degree of invasion)	16	12,5	68,7	75,0	397,6±37,0
2 group (average degree of invasion)	49	38,7	91,8	93,8	846,3±16,89
3 group (high degree of invasion)	11	63,6	100,0	100,0	1525,2±83,67
Total of the sow group	76	38,3	86,8	89,6	849,7±42,00

The gastroscopic picture of 76 sows infected by *Ollulanus suis* corresponded to the following forms of gastritis: acute catarrhal (12,9%), erosive (7,4%), ulcerative (1,8%) and chronic hypertrophic (77,7% of animals). In the helminthological study of carcasses of 192 pigs from farms of the Kyiv region, the presence of *Ollulanus suis* in the stomachs of 108 animals (55,1%) was established. The age dynamics of ollulanosis infection in pigs was characterized by an increase in the intensity of invasion with age (Table 2).

From the results obtained, it can be seen that the intensity of invasion by *Ollulanus suis* in swine of slaughter age is 14,3%, while the parental population is invasive at 71,4–77,6%. Extensiveness of the invasion similarly increased with age, so it was 1047,0±248,20 in piglets of 5-6 months of age, while in the boars – 2634,5±980,55 ex. parasites.

Table 2. Age-old dynamics of pigs infected by *Ollulanus suis*

Age and technology groups	Investigated animals,	Infected Animals.	Intensity of invasion,%	Extensiveness of invasion
5–6-month	21	3	14,3	1047,0 ±248,20
7–8-month	19	4	21,0	1189,8±222,65
9–10-month	18	4	22,2	1432,0±313,60
11–12-month	15	6	40,0	1619,3±438,50
Sows	98	76	77,6	849,7±420,00
Boars	21	15	71,4	2634,5±980,55
Total	192	108	55,1	-

DISCUSSION

Ollulanosis, due to its large distribution among pigs, can bring significant economic losses to the pig industry as a result of lesion of the animal's mucous membrane, disturbances of digestion and conversion of feed, which is reflected in profitability. At the same time, methods for intravital diagnosis of this parasitic disease are not developed enough and have controversial efficacy. In assessing the diagnostic methods we proposed, it was found that gastric lavage has a low diagnostic value and with the help of this method it was found 38.3% of infected animals, and only 12.5% of pigs witn low degree of invasion were able to detect by this method. In our opinion, the low efficiency of this method is primarily due to the localization of the parasite in the thickness of the folds of the mucous membrane of the stomach [4]. Microscopy of gastric mucus samples and gastric mucosal biopsies obtained with a gastroscope showed a rather high diagnostic level. These methods revealed 86.8% and 89.6% of the affected pigs. Using the gastroscope in parallel allows us to assess the condition of the gastric mucosa and the degree of development of pathological processes in it. The latter most often manifested in the form of chronic hypertrophic gastritis in 77.7% of diseased animals. According to the analysis of the age dynamics of pigs' disease by the causative agent of ollulanosis, clearly expressed increase in the level of lesion of animals with age, this is associated with the accumulation of the pathogen in the body as a result of autosuperinvasions.

CONCLUSION

The conducted study found that the level of infection of pigs with nematode *Ollulanus suis* is significant and amounted to 55,1% of the studied pigs' population. Microscopy of gastric mucosa and biopsy of the gastric mucosa are valuable intravital methods for diagnosis ollulanosis in pigs, but are rather laborious. Promising, in our opinion, is the development of ELISA and PCR tests that would greatly simplify the diagnosis of ollulanosis in pigs.

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