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Pigs enzootic pneumonia problems

Aishpur O.[1], Mushtuk I.[2], Humeniuk V.[3], Yermolenko O.[4]

[1, 2]Institute of Veterinary Medicine of NAAS, 30 Donetska Str., Kyiv, 03151, Ukraine, [3]Company «Kievmedpreparat», 139 Saksaganskogo Str., Kyiv, 01032, Ukraine, [4]Institute for Laboratory Diagnostics and Veterinary Sanitary Expertise, 30 Donetska Str., Kyiv, 03151, Ukraine; e-mail: 1olenaayshpur@gmail.com, [2]mushtuk0104@gmail.com, [3]Volodymyr.Gumeniuk@arterium.ua, [4]alex-dndi@ukr.net

The purpose. To study the epizootic situation with monitoring studies on enzootic pneumonia among the pig population in pig farms and to establish the main factors that may be the reason for its spread in Ukraine. **Methods.** Epizootological examination, clinical, bacteriological, pathological, anatomical, serological and molecular genetic studies to determine the role of Mycoplasma hyopneumoniae in infectious diseases of pigs. **Results.** According to the results of epizootological monitoring, bacteriological, serological, molecular genetic studies, the spread of enzootic pneumonia among the livestock of pigs in Ukrainian farms was established. It was determined that the clinical signs of the disease in piglets appear already at 34-50 days of age, depending on the duration of weaning from sows and cover up to 30% of the livestock. At the autopsy of dead piglets of different ages, it was found that in 54% of cases, lung lesions characteristic of enzootic (mycoplasma) pneumonia were recorded. The percentage of pathological and anatomical changes in the respiratory tract recorded at autopsy increased depending on the age of the pigs. So, in piglets up to the age of 1 month respiratory tract damage was diagnosed in 6.6%, at the age of 40 days their number increased sharply — up to 24.2%, at the age of 120 days — up to 100%. According to the results of studies, it was found that the main carriers of the causative agent of enzootic pneumonia can be considered boars (up to 68.5%), repair pigs (up to 64%) and sows (up to 28.1%). Despite such a high level of carriage among the main livestock, the results were positive in 26.7% of suckling piglets, after weaning from sows they decreased to 11.6 and again increased to 22.1% in piglets aged 60 – 120 days. **Conclusions.** The study of the problem of enzootic (mycoplasmal) pneumonia of pigs indicates its spread in most pig farms in Ukraine, the scale of the losses, in this case, depends on the number of livestock and the technology of growing animals.

Key words: *mycoplasmal pneumonia, epizootological examination, pathology, livestock, pathogen.*

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Enzootic pneumonia (EP) now is the one of the most widespread diseases on the pig farms, especially with high closeness of population and seroprevalence can arrive at a 100 %. Disease is infectious and runs across mainly in a chronic form as the results in considerable economic losses in the pigfarms. As a result of continuous technologies of production of pork in the conditions of insufficient ventilation, excessive congestion of animals, the risk of development of enzootic pneumonia is very high. Middle indexes of death rate to the sapling/pl of pigs in farms, where the flash of enzootic pneumonia was fixed, arrives at 15 % of all the animals.

In the Ukrainian pig farms the swine respiratory diseases are widely widespread and arrive at 30-35 % to attitude toward their general pathology [1,2]. Enzootic pneumonia among pigs behaves to the economically meaningful diseases. Researchers specify that for 75 % of slaughter swine the pneumonias characteristic for enzootic pneumonia find hearths [3]. Morbidity in some pigfarms can arrive at a 100 % and death rate that is observed beginning among 3-6-a week's piglets hesitates from 0,5 % to 20% . *Mycoplasma hyopneumoniae* is the causative agent of enzootic pneumonia of pigs, in addition plays an important role at development of respiratory symptom-complex of pigs - multicomponent disease [4]. A causative agent mainly spreads air-drop by a way. In distribution of enzootic pneumonia regrouping of animals and introduction have the special value to the herd of bought in the unhappy farms of pigs with

Mycoplasma hyopneumoniae. Such situations quite often arise up in fattening farms and consequently disease gains character epizootic.

In the modern pork production epizootics of enzootic pneumonia does not have the expressed seasonality - disease arises up at any time year. To the epizootic process at enzootic pneumonia of pigs peculiar stationarity of epizootic hearths and varying of his intensity from sporadic to widely widespread of disease.

From data of foreign researchers the lethality does not exceed a 3-4 %, that in case of satisfactory terms of maintenance and feeding, treatment begun in good time. But failure to observe of such terms enzootic pneumonia becomes complicated by a microflora (*Pasteurella spp, Bordetella spp, Haemophillus spp, Streptococci, Staphylococcuss* and others) with development of heavy forms of pneumonias, in this case lethality can increases to 80-90 % [5].

Usually display of mycoplasmas infections related to violation of the symbiotic system as a result of the massed co-operation of endo- and exogenous (including ecological) factors. Mycoplasmas infections is the original indicator of stress of organism (or biosystems). Weight of motion of enzootic pneumonia depends on the general of health of pigs, presence of helminthisms, and also from the terms of maintenance. In pigfarms, where animals are in the badly ventilated cold apartments and have the unbalanced feed that differs in insignificant maintenance of necessary vitamins and minerals, morbidity of population can arrive at 40-85 % thus a difference can arrive at an about 15 %. Disease can not show clinical signs, here and the productivity of the sick pigs goes down approximately on 20 %.

Goal of researches. On the basis of monitoring researches to study distribution of enzootic pneumonia at Ukrainian pigfarms.

Methods of researches. Diagnostic researches conducted in the laboratory of bacterial disease of the animals of Institute of veterinary medicine of NAAS and in the pig farms of Ukraine. Epizootic inspections, clinical, bacteriological, pathoanatomical, serological and molecular-genetic methods were used.

Results of researches. On results the epizootic monitoring of enzootic pneumonia among the population of pigs, distribution of this disease is set in the farms of Ukraine. In all inspected pigfarms we are conduct the pathoanatomical sections of the lost piglets with the goal of establishment of reasons of destruction and exposure of pathoanatomical changes in internalss. At pathoanatomical sections determined the most characteristic changes for enzootic (mycoplasmas) pneumonia is catarrhal inflammation of apex and cardiac parts of lungs, sometimes with passing to the diaphragmatic parts (Fig. 1, 2).

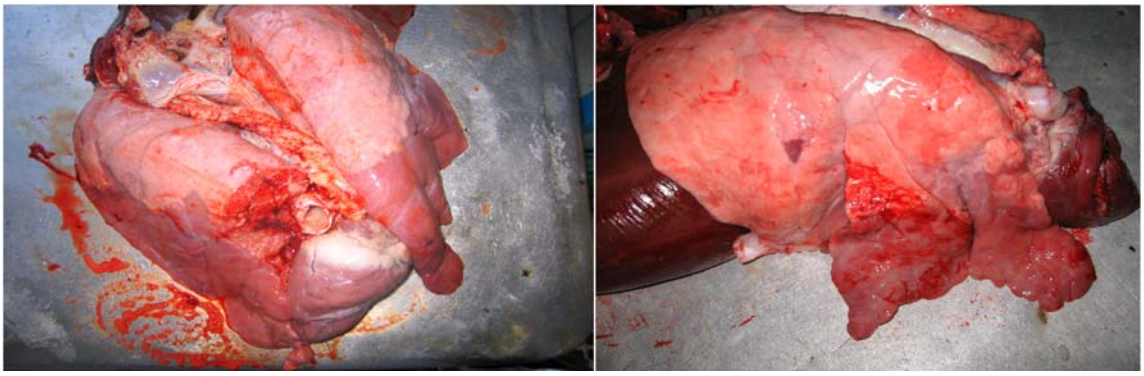


Fig. 1, 2. Changes in lungs by the enzootic (mycoplasmas) pneumonia with catarrhal inflammation of apex and cardiac parts of lungs, sometimes with passing to the diaphragmatic parts

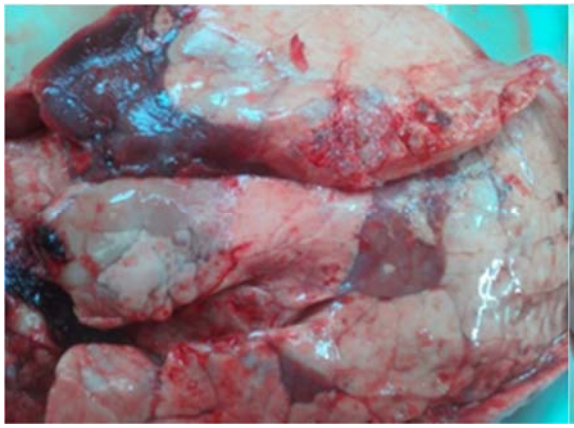


Fig. 3. Catarrhal inflammation of apex and cardiac parts of lungs, sometimes with passing to the diaphragmatic parts

Fig. 4. Changes in lungs by the enzootic (mycoplasmas) pneumonia: catarrhal inflammation of diaphragmatic parts of lungs

The characteristic changes for enzootic (mycoplasmas) pneumonia at pathoanatomical researches made 54,0 % from other types of lesions of respiratory system (Fig.5).

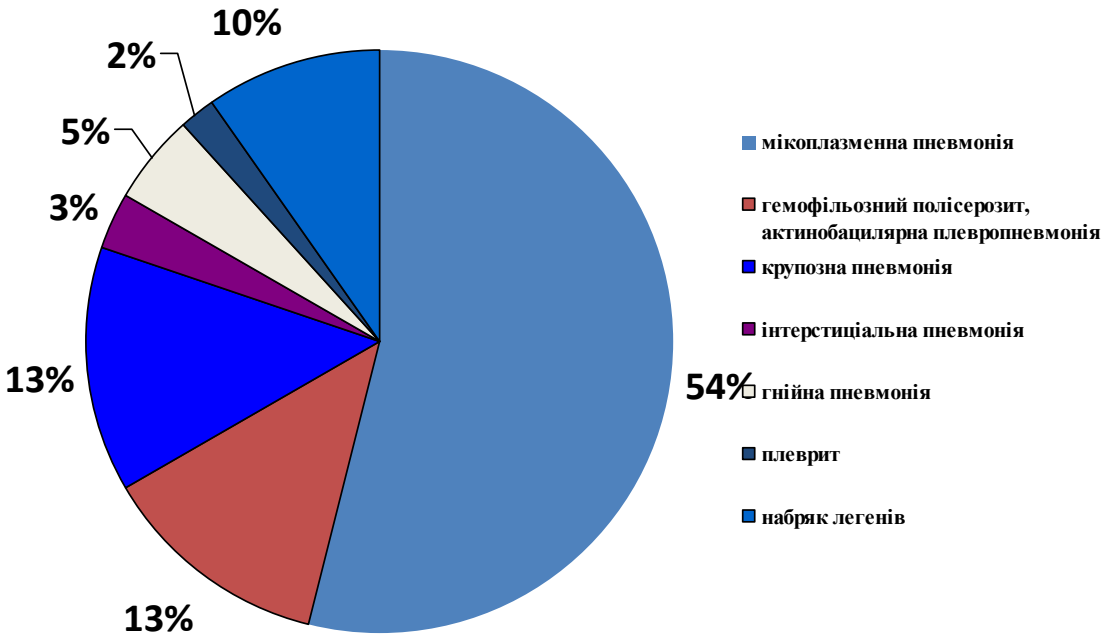


Fig. 5. The results of pathoanatomical researches of lungs of the lost piglets and pigs in age from 41 a to 160 twenty-four days

With the goal of study of research EPP conducted in stationary unhappy pigfarms. A diagnosis on EPP was set complex taking into account a general epizootic situation, data of clinical and epizootic inspection of herd of the different age-related groups, results of pathoanatomical research, laboratory researches of pathological material and serums of blood.

For the study of epizootic situation in relation to enzootic pneumonia the inspection of population of pigs was conducted in the Ukrainian pigfarms. The results of bacteriologic examinations of lungs are analysed from the lost and forcedly hammered sows, piglets to two a week's age, before absence and in 10-20 days after absence from sows.

The etiologic structure of bacterial bronchopneumonias is presented on Fig. 6.

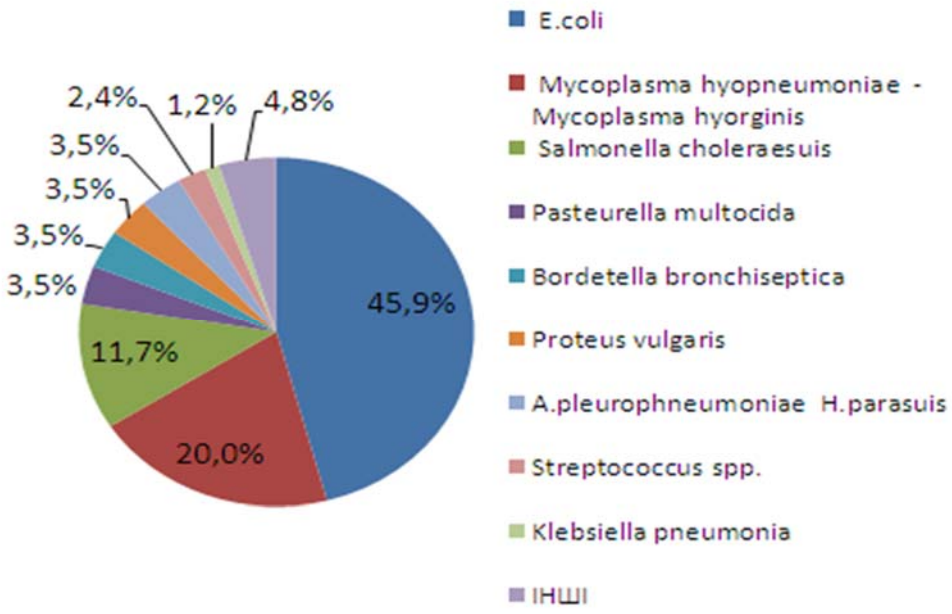


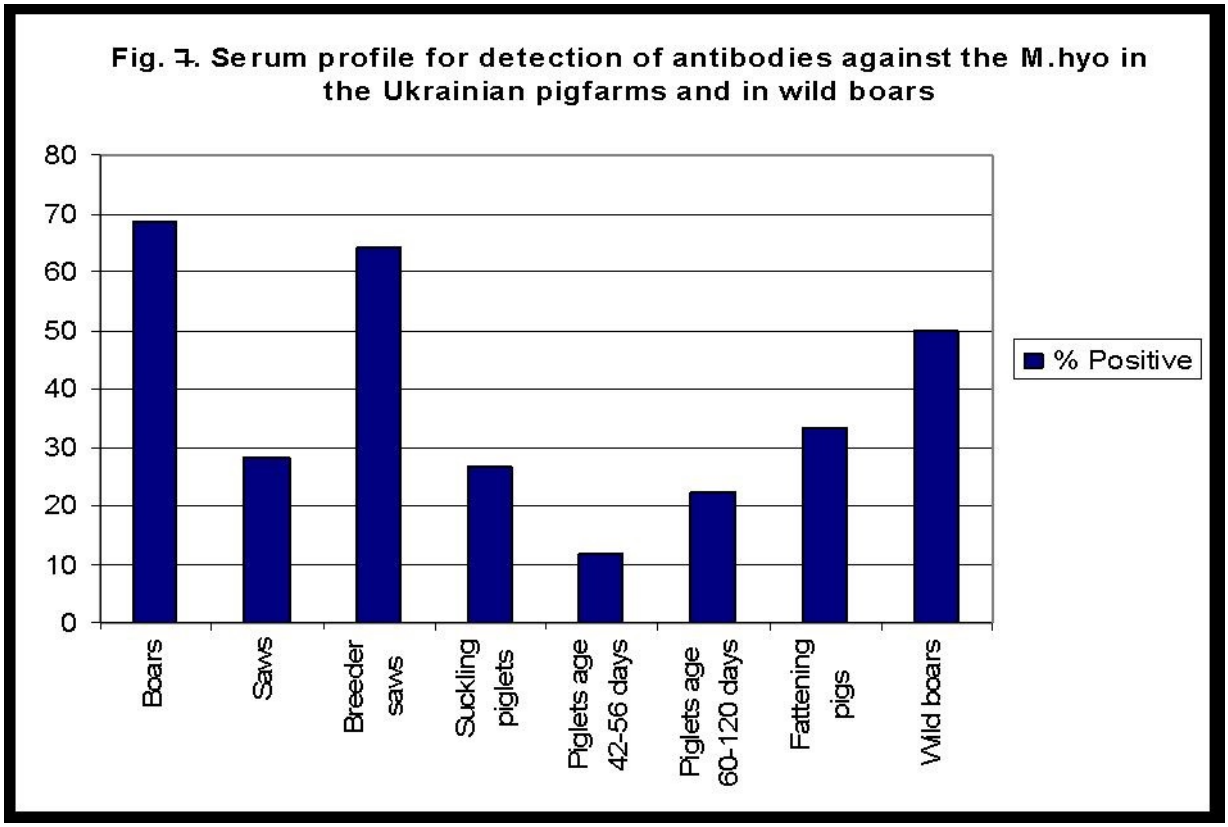
Fig. 6. The etiologic structure of bacterial bronchopneumonias

At our researches from the lungs of the lost piglets 16 types of microorganisms were abstracted from that 20 % mycoplasmas and including 18,8 % of the *Mycoplasma hyopneumoniae*.

Molecular-genetic researches of pulmonary mycoplasmosis of pigs conducted by means of polymer chain reaction (PCR). The ten cultures of mycoplasmas isolated from the staggered lungs were investigated. The samples of biomaterials are selected in 9 pigfarms. Genetic material of bacterias *Mycoplasma hyopneumoniae* Mycoplasma hyorginis and *Mycoplasma spp* is found in that samples.

The results of a study of ten cultures of mycoplasma isolated from bacteriological examination from the lungs of dead pigs and adult pigs in the polymerase chain reaction indicate that two of them belong to the species *Mycoplasma hyorginis*, six - *Mycoplasma hyopneumoniae* and two - unidentifiable *Mycoplasma spp*, which confirms the circulation of pathogens of mycoplasmosis in the heard of pigs in Ukraine.

We conducted serological monitoring of 510 sera from pigs of different ages from pig farms in 8 regions of Ukraine for antibodies to *Mycoplasma hyopneumoniae*. For this purpose, a set based on monoclonal antibodies for ELISA by DACO (Denmark) was used (Fig. 7).



According to the results of research, it is found that agent of enzootic pneumonia can be considered as the main herd – boars (up to 68.5%), repair pigs (up to 64.0%), and sows (up to 28.1%). It should be noted positive results among wild pigs 50% of the subjects, which indicates the source of the pathogen in the wild.

Conclusions

The epizootic examination, clinical, bacteriological, pathological, anatomical, serological and molecular genetic studies have determined the significant place of the pathogen *Mycoplasma hyopneumoniae* in infectious pathology of pigs. It has been established that enzootic pneumonia is diagnosed in most pig farms in Ukraine, and the extent of its damage depends mainly on the number of livestock and the technology of retention. In bacteriological studies, pathogens of bacterial infections were isolated from the affected lungs of the dead pigs, of which 18.8% was *Mycoplasma hyopneumoniae.*

The study of the problem of mycoplasmas pneumonia of pigs indicates the need for its continued monitoring in pig farms in Ukraine. Correct and timely diagnosis is important in the control of the disease, so it is mandatory to develop modern and develop new methods for the study of mycoplasmosis. The absence of a domestic immunobiological preperations for pig enzootic pneumonia indicates the need to construct a vaccine from local strains of *Mycoplasma hyopneumoniae*.

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