PATHOHISTOLOGY AS A DIAGNOSTIC TOOL FOR CONFIRMATION OF THE SUDDEN DEATH SYNDROME OF SOWS AND ITS FREQUENCY AND DISTRIBUTION IN UKRAINE

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INTRODUCTION

Mortality rate of sows is one of the determinants of financial prosperity of the farm (1, 2). Sudden death without apparent clinical signs is the most characteristic clinical manifestations of *Clostridium novyi (C. novyi).*

C. novyi is an anaerobic, spore-forming gram-positive rod. Toxigenic types A and B are involved in swine infections. Alpha toxin is produced by strains of type A and B and its dissemination causes edema, serosal effusion, hepatic necrosis, and peracute or acute death (3). Spores of potentially pathogenic *C. novyi* form normal micro flora of the large intestine. However, it is proved that external factors such as stress and feeding disorders could provoke clinical manifestation of *C. novyi.* In this case, laboratorial diagnosis must be done.

The aim of the study was to analyze sudden death cases and identify the clinical signs and the histopathological changes of *C. novyi* affected pigs in Ukraine.

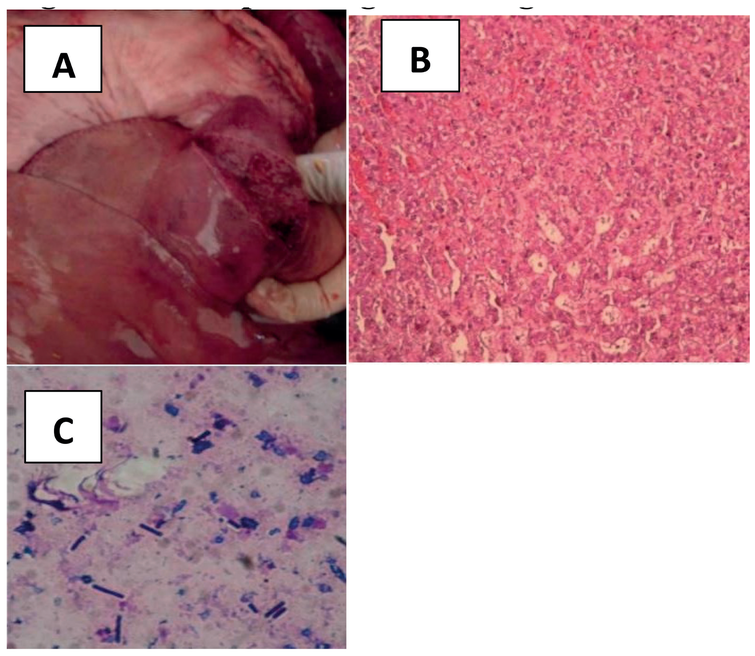
MATERIALS AND METHODS

Analysis of pathological lesions was performed in suddenly dead pigs. Besides, samples of tissues (kidney, liver, spleen, lungs, heart, brain, trachea, lymph nodes) were collected during necropsy for further histological examination and analysis. Eosin and hematoxylin standard solution was used to prepare histological samples. An analysis of tissue imprints was performed to detect *C. novyi*-like bacteria using Gram staining method.

RESULTS

During histological examination of liver, degenerative changes in hepatocytes and multiple large areas of necrosis of parenchyma were detected. In 80 % of cases, colored round cavity between hepatocytes (gas bubbles) was observed. In 20 % of cases multiple hemorrhages were visualized between necrotic hepatocytes, but no signs of gas bubbles were found. Besides, in 90 % of cases, classical histopathological signs of necrotic enteritis were found (Fig. 1A, 1B). During the examination of fresh imprint samples large gram-positive rod-shaped bacteria were found in all cases (Fig 1C).

Figure 1. Histopathological changes in the liver



A, B: Parenchyma necrosis and gas bubbles between hepatocytes; C: Imprint smear: gram-positive rod-shaped bacteria.

To determine the distribution and the frequency of sudden death cases caused by *C. novyi*, data from different farms (from 5 different Ukrainian regions) were analyzed. In conclusion, it was determined that in 2 regions the rate ranged between 3,8 - 4,1 ±0,05 %, in 2 other regions it ranged from 2,5 - 3,5 % ±0,05 % and in 1 region it reached no more than 2 % ±0,05 %.

CONCLUSIONS AND DISCUSSION

Efficacy of histology as a diagnostic tool for *C. novyi* was proved. Besides, it was shown that histology could be used to detect histopathological changes (caused by immunodeficiency, non-balanced feeding, allergy, viral hepatitis, etc) which could trigger the development of *C. novyi* infection. The only weak point of this method was the significant dependence on the quality of samples.

The distribution rate of *C. novyi* cases among Ukrainian demonstrated the presence of sudden deaths caused by *C. novyi,* for this reason further control and specific prophylaxis in farms are needed.

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