MONITORING OF ANTIBIOTIC RESISTANCE IN ISOLATES OF *ACTINOBACILLUS PLEUROPNEUMONIAE* IN THE WEST PART OF ROMANIA BETWEEN 2005 AND 2009

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Summary

Pleuropneumonia is one of the most important bacterial diseases of the respiratory tract of the pig and occurs in most pig-keeping countries. Its importance derives from the fact that it can cause pneumonia that results in death, clinical disease may become chronic or subclinical disease in successive batches of pigs and can causes losses from death, reduced production, and increased costs of medication or vaccination (3, 5, 6, 7).

In all 86 strains isolated during 2005 and 2009 and tested for antibiotic resistance it could be observed that resistance to gentamicin, oxytetracicline was detected most frequently over the monitored period. Instead, resistance to penicillin, amoxiklav, enrofloxacin and cephalosporins was decreased.

The present study's purpose was to determine antibiotic resistance of *Actinobacillus pleuropneumoniae* strains isolated from pigs in the west part of Romania between 2005 and 2009.

Key words: *Actinobacillus pleuropneumoniae*, antibiotic resistance

Increased use of antibiotics, which are broadly administered for both therapy and prophylaxis, is closely associated with frequent occurrence of the disease (1, 4). The sensitivity of *A. pleuropneumoniae* to antibiotics and chemotherapics we studied showed a various and unstable behavior of this species, very different in time and place, dependent on the area and time of isolation, reason why the antibiogram represents an indispensable tool before a treatment is established in pig pleuropneumonia. Our studies show that an excessive usage of some antibiotics and chemotherapics in order to prevent or treat pig pleuropneumonia, especially using medicated food may have negative results, as the selection of resistant strains which in time may replace the sensitive strains to a certain antibiotic or chemotherapic that is used at random, without knowing the sensitivity of germs from the population (6).

Materials and methods

A number of 86 (2005-2007 - 40 isolates, 2008-2009 – 46 isolates) *A. pleuropneumoniae* isolates were obtained from 7 farms from the west part of Romania. *A. pleuropneumoniae* ATCC 27090 was used as quality reference strains. The strains were grown on blood agar supplemented with 5% defibrinated blood using a strip of *Staphylococcus aureus* as a source of NAD.

Antibiotic resistance of *A. pleuropneumoniae* was tested by the disk diffusion method using standardized methodology described by the National Committee for Clinical Laboratory Standards (NCCLS, 1999). The identification of isolates as A. pleuropneumoniae was based on Gram staining, positive hemolysis on 5% blood agar, and a positive CAMP reaction (5, 7).

In the paper resistance to 10 antimicrobials was tested. Following disks were used: florfenicol (FFC 30 µg), enrofloxacin (ENF 5 µg), penicillin (P 10 U.I.), lincomycin (L 15 µg), gentamicin (G 10 µg), cefaclor (CL 30 µg), amoxicillin-clavulanic acid (AMC 30 µg), amoxicillin (AML 10 µg), oxitetracycline (O 30 µg), tulathromicin (TUL 30 µg).

Results and discussions

The sensitivity of *A. pleuropneumoniae* to antibiotics and chemotherapics we studied showed a various and unstable behavior of this species, very different in time and place, dependent on the area and time of isolation, reason why the antibiogram represents an indispensable tool before a treatment is established in pig pleuropneumonia.

In all the 86 isolates examined in this study, the highest resistant to antimicrobials we found in oxitetracycline, cefaclor, enrofloxacin and amoxicillin-clavulanic acid. Resistance to tulathromicin, lincomycin, amoxicillin and gentamicin sharply increased in the last year, although a relative low resistance was observed to lincomycin, amoxicillin and gentamicin and no resistance to tulathromicin in the previous research. To amoxicillin-clavulanic acid, enrofloxacin and less to cefaclor the resistance decreased in 2008-2009 in comparison with 2005-2007 (figure 1).

It could observed the slightly increase of percent of resistance to florfenicol (2.1% comparising with 0%) and more evident increase to tulathromicin (32% comparising with 0%).

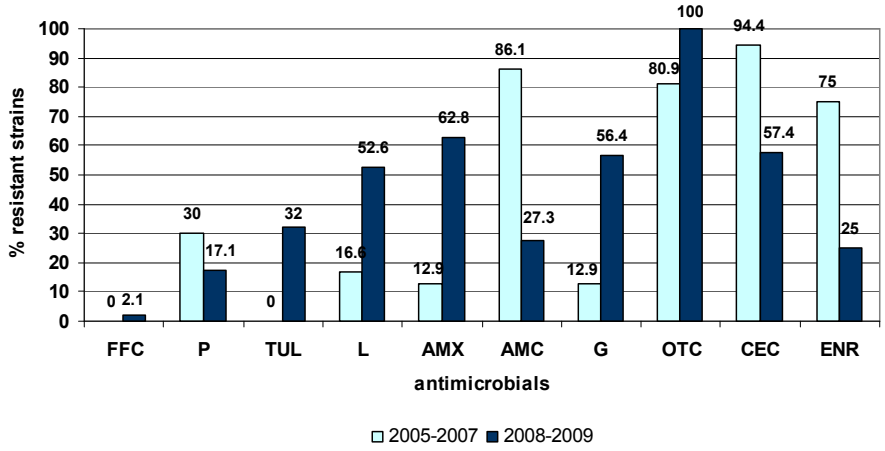

Fig. 1. Percentages of resistance strains of *A. pleuropneumoniae* detected between 2005 and 2009

Penicillin and tetracyclines have been reported as the most frequently used drugs for treatment of porcine respiratory tract infections (1, 6). With the frequent occurrence of tetracycline resistance, this drug should probably not be used as a first choice unless susceptibility test results have shown susceptibility. Therefore, the occurrence of resistance and trends in resistance should be monitored carefully for *A.pleuropneumoniae*. The results obtained should be made available for veterinarians for an effective usage of these drugs and to minimise the selection pressure for antimicrobial resistance.

Conclusions

Our studies show that an excessive usage of some antibiotics and chemotherapics in order to prevent or treat pig pleuropneumonia, especially using medicated food may have negative results, as the selection of resistant strains which in time may replace the sensitive strains to a certain antibiotic or chemotherapic that is used at random, without knowing the sensitivity of germs from the population.

The highest resistant to antimicrobials it was found to oxitetracycline, cefaclor, enrofloxacin and amoxicillin- clavulanic acid.

Resistance to tulathromicin, lincomycin, amoxicillin and gentamicin sharply increased in the last year, although a relative low resistance was observed in the previous research.

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