

## USAGE OF PHENOXYPEN WSP IN TREATING THE NECROTIC ENTERITIS IN BIRDS

### C. CUMPĂNĂȘOIU

Faculty of Veterinary Medicine Timișoara

#### Summary

There has been made an experiment in order to test the efficiency of Phenoxyphen WSP (penicillin V) antibiotic in treating the necrotic enteritis produced by *Clostridium perfringens*.

The experiment has been conducted on three lots of birds with ages between 2-14 weeks. Phenoxyphen WSP is an acid resistant derivative of benzyl penicillin (penicillin G) and possesses a wide spectrum of activity which includes: streptococci, staphylococci, beta-hemolytic streptococci, *Listeria monocytogenes*, *Corynebacterium spp.*, and *Clostridium spp.*

**Key words:** Phenoxyphen WSP, birds, necrotic enteritis

Phenoxymetil penicillin (penicillin V) is narrow-spectrum penicillin with a bactericidal activity against mainly Gram-positive bacteria (1, 2, 3).

Penicillin V, like all penicillin, acts bactericidal on especially growing bacteria and should not be combined with macrolides and bacteriostatic antibiotics, like tetracycline and cloramphenicol.

Penicillin V is an acid resistant derivate of benzyl penicillin (penicillin G), and possesses a very similar spectrum of activity. Sensitive are staphylococci, streptococci, beta-hemolytic streptococci, *Listeria monocytogenes*, and *Corynebacterium spp.* and *Clostridium spp.*

Penicillin acts synergistically when combined with amino glycosides, like streptomycin, neomycin, kanamycin and gentamicin, and in combination with pharmaceuticals that bind to beta-lactamase enzymes, like cloxacilin and clavulanic acid.

#### Materials and methods

Researches have been conducted in a poultry farm on three lots of birds with ages between 2-14 weeks with clinical signs of necrotic enteritis.

Necrotic enteritis has been associated with *Clostridium perfringens*, types A and C. *Clostridium perfringens* is a normal inhabitant of the intestine of healthy chickens and their environment, but normally it does not cause disease. It occurs most frequently in houses with built-up litter.

The antibiotic has been administered in drinking water. Phenoxyphen WSP dissolves easily and quickly in drinking water. The maximum solubility of the product is more than 250 grams per liter of drinking water and the rate of

dissolution is less than one minute. The dosage has been established at 46-68 mg Phenoxyphen WSP per kg body weight which corresponds to 10-20 mg penicillin V per body weight for 5 days.

Because of variation in water-uptake, Dopharma advises the following calculation to be made to determine the quantity in gram Phenoxyphen WSP to be added in 1000 liters of water:

Mg Phenoxyphen WSP/kg body weight/day\*mean body weight of individual animals (kg)\*number of animals

----- =  
Total water consumption of the house (liters) at the previous day  
= mg Phenoxyphen/l\*1000= g Phenoxyphen/1000 l water.

Taking into account that sick animals may drink less, it is recommended to start therapy with the higher dose, to compensate for a possible lower intake of the medicated water.

### Results and discussions

Necrotic enteritis is an acute disease that affects young poultry of about 2-14 weeks of age, it is most often seen in broiler chickens (2-5 weeks of age), but it can be found in all chickens, turkeys (7-12 weeks of age), ducks and wild birds worldwide.

The disease has a sudden onset and a high level of mortality (up to 50%). The main pathological finding is confluent necrosis of the mucosa of the small intestine. Clinical signs are the consequence of explosive growth of *Clostridium perfringens* in the small intestine, which is accompanied by toxin production. A disturbance of the balance between intestinal micro-organisms can be triggered by a change in diet, especially a sudden increase in the protein level.

The first symptoms of necrotic enteritis may resemble those of coccidiosis. Affected animals become depressed and may show signs of diarrhea, sometimes with blood. Animals suffering from other infections, like coccidiosis, will be more prone to develop the severe symptoms of necrotic enteritis.

On necropsy, the characteristic lesions found in the mucosa of the small intestine are small, sometimes only microscopic ulcers and light yellow spots, but also membranes covering the mucosa can be found, and liver lesions, such as cholangiohepatitis or a multi-focal hepatitis.

The evolution of the disease causes major economic losses due to increased mortality rate, inequality of the group and problems at slaughter.

Usage of Phenoxyphen in treatment of this disease has taken into consideration the plasmatic levels, which are reached quite quickly, in 1-2 hours, a very important aspect taking into consideration that in the affected lots the mortality grows extremely fast. In addition to that, penicillin V won't create resistant strains between intestinal micro-organisms, due to the fact that those micro-organisms are not sensitive to the penicillin. The appearance of resistance to antibiotics has

become a problem for public health and appears, usually, when wide-spectrum antibiotics are being used. Enterococcus, E. coli and Salmonella spp., especially strains from swine and birds, are nowadays resistant to many antibiotics, and it has been proved that these resistances can also occur in those strains which are pathogen for man.

The great virtue of penicillin V in comparison to penicillin G is that it is resistant to acid, leaving in a greater fraction the drug to reach the small intestine. It is better absorbed from the gastro-intestinal tract and has an absolute bioavailability of 69% in poultry.

We mention that Phenoxyphen WSP should not be used in combination with bacteriostatic drugs.

### **Conclusions**

Phenoxyphen WSP, containing 325 mg phenoxymethyl-penicillin-K, was registered by Dopharma for necrotic enteritis caused by Clostridium perfringens in chickens.

Penicillin V has a high therapeutic index, making it safe for use in even very young chickens and in groups of animals with variation in water-uptake within the group.

Taking into account that sick animals may drink less, it is recommended to start therapy with the higher dose, to compensate for a possible lower intake of medicated water.

### **References**

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