Treatment efficacy of benzylpenicillin and detection of *Actinobacillus pleuropneumoniae* by PCR

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CONCLUSION

Benzylpenicillin effectively reduced clinical signs and detection of APP by PCR in lungs but did not prevent pigs from becoming subclinical carriers of APP.

AIM

This study aimed to evaluate treatment efficacies for benzylpenicillin treatments on infections with *Actinobacillus pleuropneumoniae* (APP) and how this correlates with detection of APP by PCR from respiratory tract samples of pigs experimentally infected with APP.

MATERIALS & METHODS

- Five groups of 6 six 40-kg SPF pigs kept at SVA were inoculated intranasally with APP serotype 2 (10¹¹ cfu).
- One group served as an untreated control (NT).
- Four groups were treated with either Ethacilin (Intervet AB, Sweden) or Ultrapen (N-vet, Sweden) (Table 1). Treatments were initiated at the onset of clinical signs (18.5 hours p.i.).
- Clinical signs of respiratory disease were monitored daily and scored from 0 (no clinical signs) to 3 (severe clinical signs).
- All pigs were euthanized 16 days p.i. and necropsied.
- Swab samples were collected from nostrils, tonsils and lungs and analysed with a real-time PCR assay targeting the apxIV gene.
- Ordinal regression analysis and Fisher’s exact test were used to detect statistically significant differences.

Table 1. Benzylpenicillin treatments of pigs inoculated intranasally with *Actinobacillus pleuropneumoniae* serotype 2 (10¹¹ cfu)

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Treatment dose (mg/kg bw)</th>
<th>Dosing interval (hrs)</th>
<th>Treatment duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH2x20</td>
<td>Ethacilin</td>
<td>20</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>UPA30</td>
<td>Ultrapen</td>
<td>30</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>ETH30</td>
<td>Ethacilin</td>
<td>30</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>ETH20</td>
<td>Ethacilin</td>
<td>20</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>NT*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Not treated

RESULTS

- Clinical scores were lower for all treated groups compared to untreated pigs (NT) (p<0.001).
- Detection of APP was less frequent in lung samples from pigs for which treatment was efficacious (p<0.01).
- Treatment efficacy did not influence detection of APP in neither nostrils nor tonsils.

DISCUSSION

The different dosing regimens of benzylpenicillin did not influence the detection of APP in neither nostrils nor tonsils suggesting that benzylpenicillin is not efficacious in preventing pigs from becoming subclinical carriers of APP. However, effectiveness of treatment, assessed by scoring of signs of respiratory disease, was associated with a reduced rate of detection of APP by PCR in lung samples.