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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 (10^{11} 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 (10^{11} cfu)

Group	Treatment	Treatment dose (mg/kg bw)	Dosing interval (hrs)	Treatment duration (days)
ETH2x20	Ethacilin	20	12	3
UPA30	Ultrapen	30	24	3
ETH30	Ethacilin	30	24	3
ETH20	Ethacilin	20	24	3
NT*	-	-	-	-

*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.

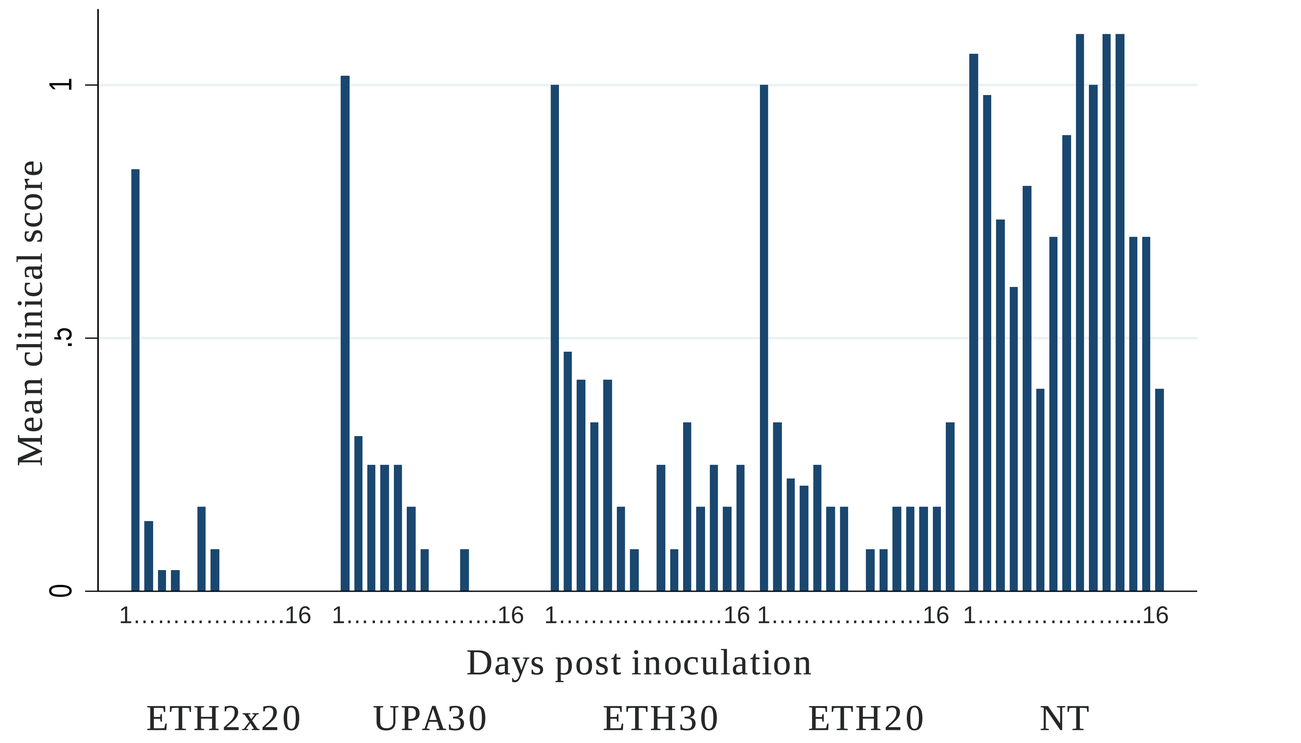


Figure 1. Mean clinical scores (0 – 3) for pigs treated with different dosings of two formulations of benzylpenicillin after being inoculated intranasally with *Actinobacillus pleuropneumoniae* serotype 2 (10^{11} cfu).

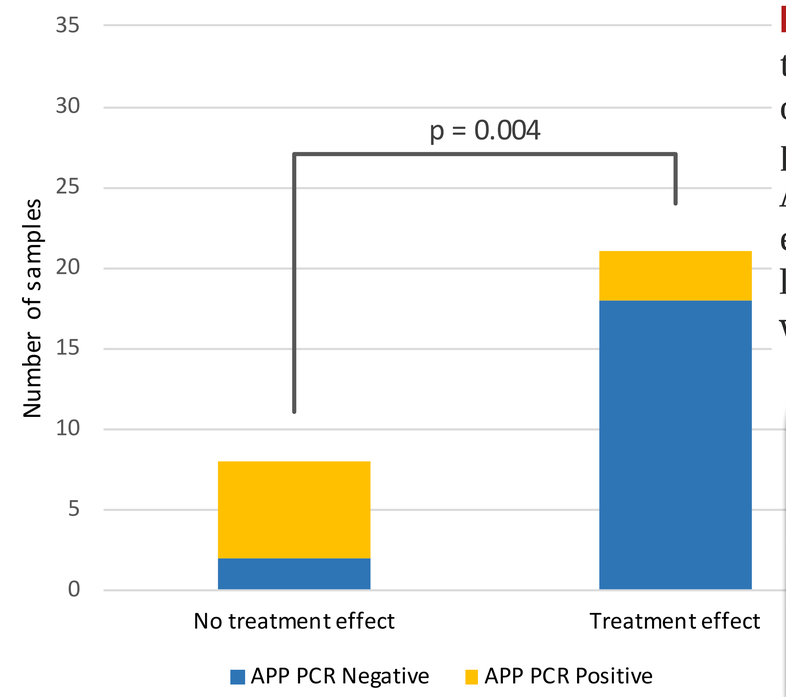
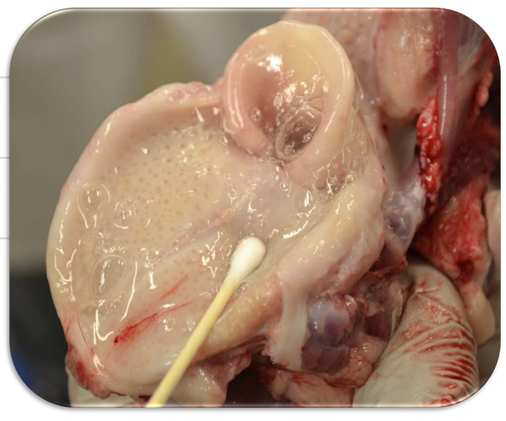


Figure 2. Association between treatment efficacy and detection of APP from lung samples from pigs inoculated with 10^{11} cfu of APP serotype 2. Treatment efficacy was achieved if at least 75% of all clinical scores were ≤0.5.



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.

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