Exudative epidermitis is difficult to treat because of widespread antimicrobial resistant *Staphylococcus hyicus*

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**Introduction**

Exudative epidermitis (EE) or greasy pig disease is caused by *Staphylococcus hyicus*. Certain strains of *S. hyicus* produce heat-labile exfoliative toxins that are important in the pathogenesis of the disease. Infection of skin wounds during the early suckling period is the typical presentation. Recently many herds have moved away from clipping needle teeth at birth. There may be a resultant, an increase in prevalence of EE. Traditionally, an injection of penicillin has been the treatment of choice but antimicrobial resistance to penicillin has been noted (1).

There are several studies determining the occurrence of different genes encoding antimicrobial resistance in *S. hyicus* (2) but there is limited information about the distribution of the *mecA* gene which encodes the low affinity penicillin-binding protein PBP 2A. The objectives of this study were to evaluate the extent of antimicrobial resistance of *S. hyicus* and to determine whether the *mecA* gene is present in *S. hyicus* in Ontario, Canada.

**Materials and Methods**

In a survey, farmers (n=49) were asked how they treated EE and whether the treatment worked. In addition herds (n=17) with EE problems were visited and skin swabs and scrapings were obtained from pigs with clinical signs of EE (generally 6 pigs per farm). Bacterial culture was performed on the samples with *S. hyicus* and *S. aureus* recovered from 77.3% (85/110) and 45.9% (50/109) of the samples respectively. Susceptibility to penicillin (pen), ampicillin (amp), ceftiofur (cef), spectinomycin (spec), sulphonamides (sul), tetracycline (tet), tiamulin (tia) and trimethoprim/sulfa (tri/sul) was determined by the agar diffusion method defined by the Clinical and Laboratory Standards Institute (CLSI). In addition, molecular studies were conducted on isolates to determine the presence of the *mecA* gene using PCR and Pulsed-field gel electrophoresis (PFGE) analysis (3).

**Results**

Based on the survey, 69.4% (34/49) of farmers used topical treatments routinely to treat EE, including mixtures of topical antibiotics, antiseptics and mineral oil. In addition, 57% of respondents said that they used injectable antibiotics and 82% indicated injectable penicillin as the treatment of choice. Many of the respondents expressed concern that treatment was of little value and that response was poor.

Antimicrobial resistance testing revealed that all isolates of *S. hyicus* and almost all isolates of *S. aureus* were resistant to penicillin and ampicillin and the majority were also resistant to ceftiofur (Figure 1).

**Discussion**

Penicillin was identified as the most common treatment choice by pig farmers and yet all isolates from cases of EE were shown to be resistant to not only penicillin but in most cases resistant to the entire family of beta-lactam antibiotics. These results explain why farmers reported a poor response to treatment of EE. Previous researchers have noted that penicillin-resistant isolates of *S. hyicus* containing the *blaZ* gene were relatively common in the pig population, affecting 50 to 75% of isolates (2). Methicillin-resistant *S. aureus* has been shown to be widespread in Ontario pig farms (4) and therefore it is not surprising that the *mecA* gene was isolated from *S. aureus* in these pigs. The relationship between *S. aureus* and *S. hyicus* and the possibility of gene transfer between these bacteria needs to be investigated further.

**References**