Antimicrobial resistance of Staphylococci isolated from Ontario pigs

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Methicillin-resistant *Staphylococcus aureus* (MRSA) “Superbug”

- Big public health issue, mainly hospitals
- More recently, concerns about community-acquired MRSA
- MRSA from pigs reported in the Netherlands in 2005, prompted us to look for it in North America
- Asked Scott Weese for help because he was doing this work in companion animals and horses
And we easily found it!

— about half the farms, about a quarter the farmers
Methicillin resistant *Staphylococcus aureus* colonization in pigs and pig farmers

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Highest prevalence of MRSA is in the nursery

What about other Staphylococci on pig farms?

• Exudative epidermitis (greasy pig disease) caused by *S. hyicus*
• Common and economically significant
An investigation of exudative epidermitis (greasy pig disease) and antimicrobial resistance patterns of *Staphylococcus hyicus* and *Staphylococcus aureus* isolated from clinical cases

Jeonghwa Park, Robert M. Friendship, Zvonimir Poljak, J. Scott Weese, Cate E. Dewey

Media wrote sensational stories

- We noted MRSA & MRSH were easier to find on antibiotic-free farms?

- We wondered about the use of high levels of zinc oxide (>2500ppm) used in starter rations as antibiotic alternative
Zinc-resistance gene czrC identified in methicillin-resistant *Staphylococcus hyicus* isolated from pigs with exudative epidermitis

Mackenzie J. Slifierz, Jeonghwa Park, Robert M. Friendship, J. Scott Weese

Zinc Oxide Therapy Increases Prevalence and Persistence of Methicillin-Resistant \textit{Staphylococcus aureus} in Pigs: A Randomized Controlled Trial

M. J. Slifierz\textsuperscript{1}, R. Friendship\textsuperscript{2} and J. S. Weese\textsuperscript{1}

\textbf{ORIGINAL ARTICLE}

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\begin{center}
\begin{tikzpicture}
\node at (0,0) {\textbf{Group 1}};
\node at (5,0) {\textbf{Group 2}};
\node at (2.5,-2) {Zinc (2500 ppm) MRSA};
\node at (7.5,-2) {No Zinc MRSA};
\node at (2.5,-4) {Is the amount of MRSA in each group significantly different after 5 weeks?};
\draw[->] (2.5,0) -- (2.5,-2);
\draw[->] (7.5,0) -- (7.5,-2);
\end{tikzpicture}
\end{center}

\textbf{YES}
Risk factors associated with MRSA on Ontario pig farms

1. Use of therapeutic Zinc Oxide
2. Heavy use of disinfectants

(All MRSA carried zinc resistance gene and genes associated with resistance to common disinfectants)
So what?

- We have a common and important pig disease that is difficult to treat with antibiotics
- We have a potential human pathogen carrying multi-drug resistance and its widespread in pig population
- The popular, simple approach of banning antibiotic growth promoters and prudent antibiotic drug use won’t solve this one
There are lessons that can be applied in human health

The Telegraph

Zinc not Vitamin C is best for fighting colds
Researchers have found that zinc is the best supplement for warding off colds, while Vitamin C is likely to be a waste of money.
How does this apply to Emergency Management?

• The spread of multi-drug AMR can be like an infectious disease and control should reflect this

• Norway’s response to a pig farm with MRSA is to slaughter the herd (low prevalence)
Thank you