factsheet

Pork Information Gateway

Methicillin-Resistant Staphylococcus aureus (MRSA) and occupational safety in the pig industry

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Introduction

Staphylococcus aureus (SA) is a bacteria that is a normal 'resident' of the nose and skin of people and other mammals. It is also an important 'opportunistic' pathogen of people that usually causes localized skin infections but can sometimes cause severe and fatal infections, most often in people suffering other health challenges. Particular clones (or strains) of antibiotic resistant SA, particularly those resistant to a drug called methicillin (thus 'MRSA'), and related compounds (including penicillins and cephalosporins) are among the most important causes of hospital-acquired infections worldwide.

Changing epidemiology of MRSA

Until recently, most cases of human MRSA infections occurred in hospitals. However, a marked increase in MRSA infections occurring outside hospitals ('community acquired' or CA- MRSA) has been observed in many countries. Media articles on CA- MRSA have been prominent in the USA over the last year, particularly fatal cases in otherwise healthy adolescents. Although animals are thought to play no role in hospital acquired MRSA, questions are now being asked about a possible role of animals in community acquired infections. In some countries it has been found that people exposed to livestock (including pigs, cattle, and horses) are at higher risk of carrying MRSA in their noses, and therefore are likely to be at elevated risk of developing MRSA infections.

MRSA has been detected in many animal species. Although MRSA isolated from companion animals tends to be similar to common human clones, the most common isolates from livestock are relatively uncommon among human cases. Recent reports from the Netherlands and Canada found a surprisingly high prevalence of MRSA in pigs and also people working with pigs. Surprisingly, all the MRSA found in pigs in Holland, and 75% of those in Canada, were of an unusual clone (now called 'livestock associated MRSA' by some in Holland). In collaboration with colleagues at the University of Iowa and Ohio State University, we are now undertaking studies to understand the situation in the USA. Dr. Tara Smith (UI) recently reported on a pilot study on a single system where 70% of pigs were positive, and all isolates examined were of a single clone with strong similarities to the common Dutch/Canada clone.

We do not adequately understand the situation in pigs in the USA, and the potential health risks of livestock associated MRSA to swine workers are not yet clear. However, the following points need to be kept in mind:

- Given the links between the US and Canadian industries, we should expect that the most likely outcome is that the US situation will be similar to that of Canada (and Holland). That is, it will not be surprising that MRSA may be fairly prevalent in pigs and also people exposed to pigs.
- The 'pig associated' clone is very distinct from the major clones causing human MRSA infections in the USA and Canada. The CDC has determined that these clones are not implicated in the increase in community acquired MRSA in the US over recent years. However, our initial work suggests that MRSA found in pigs in the USA may (as in Canada) be more diverse than the single clone being found in Europe.
- The 'pig associated' clone can certainly cause human infections – a small number of cases, including some severe infections, have been reported from Holland. However, there is no report yet of fatal disease. Given that Holland (which has a rigorous surveillance system for MRSA) is an important pig producing country and has been aware of high prevalence of exposure of workers for several years, this indicates that we are not likely facing any imminent crisis for occupational health in the industry.
- Farms are places where minor injuries (e.g. skin cuts) are frequent. Recognition that our workers may have an above average risk of MRSA exposure should make us ensure that proper procedures are in place for rapid treatment of workplace injuries.

  The following points are important:
  - Practice good personal hygiene – regular hand washing with soap and water;
  - Pay attention to existing and new skin wounds (clean and cover with bandages until healed);
  - Do not share personal items
  - Seek medical attention if concerned about any infections that develop.
- There are also recent reports that MRSA can be isolated from pork. The Dutch authorities have assessed foodborne transmission of MRSA in pork to be of negligible importance, and the organism is destroyed by cooking. However, as with other potential foodborne organisms, practicing good hygiene when handling raw meat products is always prudent.

References

For more information on MRSA see the CDC Web site at http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca_public.html#8