Meticillin-resistant *Staphylococcus aureus* in companion animals

Nola Leonard
Veterinary Sciences Centre
School of Agriculture, Food Science and Veterinary Medicine
MRSA in pets - background

• Dogs and cats
  – *S. intermedius* (up to 90%)
  – *S. aureus* (<10%)

• Rabbits
  – *S. aureus*
MRSA in pets - background

- 1988 - Cat suspected as source of MRSA in geriatric ward
- 1989 – MRSA isolated from post-surgical wound infection in dogs (USA)
- Increasing numbers of publications late 1990s and 2000+
  - Background of worldwide human problem
MRSA in pets – why be concerned?

• Infections in animals
  – Cats, dogs, rabbits, exotics
  – Post surgical wound infections
  – Respiratory disease
  – Skin infections
  – Urinary disease
MRSA in pets – why be concerned?

- Difficulty in treating multiresistant organisms
- Orthopaedic implants – biofilms?
- Carriage / colonisation
- Transmission to humans
  - Owners
  - Veterinary personnel
MRSA in pets – how big is the problem?

UCD

- Testing for meticillin resistance (5µg/disk) began 2001
- Two isolates in 2001
- First ‘cluster’ at the end of 2002
- Urban small animal practice
  - Submitted samples from 5 animals over a 4-month period which tested positive for MRSA
Clusters of MRSA infections, 2003
Cluster outbreaks 2005
How big is the problem in pets?

- **Ireland**
  - 13% dogs with clinical infections – referral hospital
  - 8% dogs with clinical infections
  - 0.6% healthy dogs  
    (Abbott et al. 2006)

- **UK**
  - 9% dogs sampled in RVC (Loeffler et al. 2005)
  - 1 of 255 healthy dogs (Rich and Roberts, 2006)

- **Canada**
  - 0.5% dogs sampled in Ontario VC (Hanselman et al., 2008)

- **USA**
  - 14% of patients in 7 vet colleges, 11% dogs  (Middleton et al. 2005)
How big is the problem in vets?

• 17.9% of 78 staff in vet hospital (Loeffler et al., 2005)
• 4.4% small animal personnel at vet conference (Hanselman et al., 2006)

• UCD – clusters of MRSA infection in animals, vet personnel always colonised

• Owners with healthcare associations?
Proving the link

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<th>Site</th>
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(Leonard et al., 2006)
Proving the link

• MRSA typing
  – AR typing
  – MLST
  – SCCmec
  – spa
  – PFGE

• Small animal and human strains indistinguishable
  – UK, continental Europe, USA, Canada
# spa typing

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<th>PFGE type</th>
<th>spa type</th>
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<td>Horse</td>
<td>Abdominal granuloma</td>
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</table>

Moodley et al., 2006
MRSA, pets and humans

• Origin of the problem?
  – Nosocomial infection in humans

• Transmission proven

• Direction?
  – both
Control of MRSA in small animals

UCD Veterinary Hospital
Ospidéal Tréidliachta UCD

School of Agriculture, Food Science & Veterinary Medicine
University College Dublin, Belfield, Dublin 4, Ireland

Tel: +353 (0)1 716 6000/1/2    Fax: +353 (0)1 716 6005
Email: uvh@ucd.ie

GUIDELINES ON THE CARE OF PATIENTS WITH
METICILLIN RESISTANT STAPHYLOCOCCUS AUREUS
(MRSA)

MARCH 2008 Version 2.0
Control of MRSA in pets

- Human guidelines
- Supporting data lacking
- Measures include:
  - Screening of animals?
  - Hand hygiene
  - Improved surgical procedures
  - Isolation, barrier nursing
  - Hygiene and disinfection
  - Screening of staff?
Summary

- MRSA in pets – reflects the problem in humans
- Clinical infections in pets
- Human to pet AND pet to human
- Emerging nosocomial infection in veterinary hospitals
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