



# MRSA

Emerging strains of antibiotic-resistant bacteria are a growing threat to the health of humans and animals. Veterinary staff are playing a key role in these developments – both as part of the cause and the solution to the problem. BSAVA Past President, Mike Jessop, attended a conference in London which examined the actions that practitioners should be taking to protect their patients and themselves



**N**ow wash your hands” is the familiar warning in toilet facilities of public buildings across the country.

Perhaps it is time for the owners of veterinary premises to put up a few more of those signs, not just in the smallest room but throughout the building.

Improving hygiene standards is a fundamental step in reversing the spread of methicillin-resistant

*Staphylococcus aureus* (MRSA), the main threat

to the effectiveness of essential antibiotic

agents. However, it is only one of many actions that veterinary surgeons and VNs will need to take to tackle this serious animal and public health risk.

A report by the influential American Academy of Microbiology (AAM), published in October, highlighted the complex reasons for the development of antibiotic resistance which, to a large extent, is an inevitable

consequence of microbial evolution. This can only be addressed through joint action by all those involved in developing, licensing, prescribing and using these drugs, creating scapegoats of any particular link in that chain will not solve the problem, the report said.

The challenge is formidable. “At the present time, resistance essentially is uncontrollable. The reasons behind the establishment and spread of resistance are complex, mostly multi-factorial and mostly unknown. The consensus was that efforts must target both bacterial transmission and antimicrobial use,” said Jacques Acar, chair of the AAM working group.

**The antibiotic issue**

Veterinary surgeons are responsible for prescribing significant quantities of antibiotics and their veterinary premises are a focal point for the transmission of resistant strains between humans and animals. So vets must take some responsibility for any loss of antibiotic sensitivity and play a big part in dealing with the consequences. Specific actions were discussed at a meeting organised by the Bella Moss Foundation, with sponsorship from Defra.

The charity ([www.thebellamossfoundation.com](http://www.thebellamossfoundation.com)) was established by Jill Moss after her dog died in 2004 as a result of developing an MRSA

infection in a postoperative wound. She has earned respect from many members of the profession as a result of her tireless efforts to raise awareness of the issue and educate both the profession and the public.

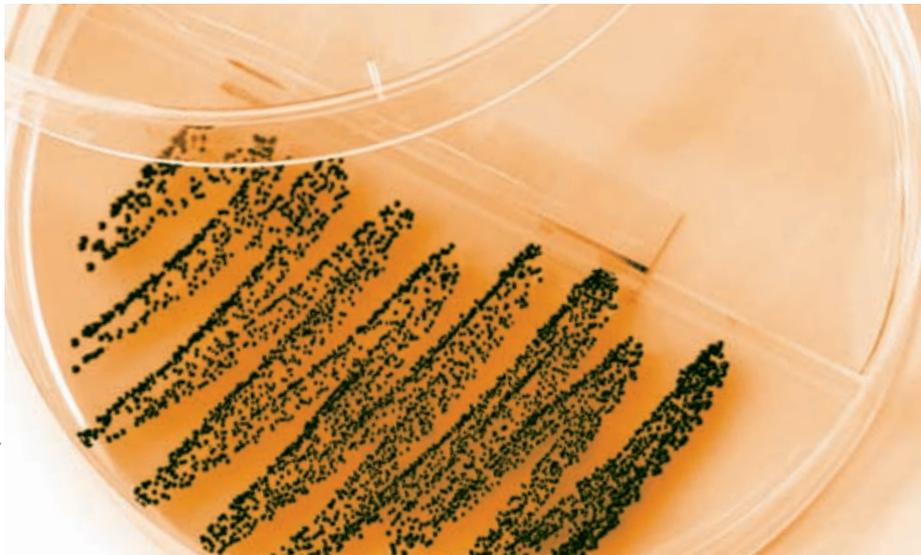
One of the main priorities for the profession must be to get a better handle on the scale of the problem in veterinary practices, says Jill Moss. “The problem here is that there is nobody collecting and collating reliable information on the number of pets that get infected with these bacteria. We have reports sent to us by members of the public and we can’t say whether these are necessarily confirmed cases. But what is clear is that the number of incidents appear to be growing – a year ago we were getting told of 10 to 15 cases a week, now it is more like 20 to 30, not just in the UK but from all over the world.”

**Growing problem**

MRSA is a much more recent problem for veterinary surgeons than for human medics, who identified the first incidents in 1961. David Lloyd, professor of veterinary dermatology at the RVC, told the meeting that the first cases in animals were not reported until 1999. MRSA in animals is now recognised as a worldwide problem and our understanding of the epidemiology of these strains is growing rapidly. The

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- ▶ commonly identified risk factors include contact with a human carrier of the MRSA organism, three or more recent courses of antibiotics, surgical implants and a stay of two or more days as an in-patient at a veterinary clinic, he said.

Vets also appear to be important as carriers of the MRSA organism, with positive swabs taken from 3.9 per cent of vets in contrast to 0.7 per cent of the general population. Moreover, studies have shown a direct link between increased veterinary surgeon colonisation and increased patient infection rates. Perhaps unsurprising as MRSA is a ubiquitous organism which transfers easily between humans, animals and fomites.

However, it would be unwise to become fixated on a single bacterial strain. The profession has to be vigilant in keeping track of emerging bacterial threats. Most animal MRSA cases occur in a hospital setting, but a community-acquired form of MRSA has become a significant challenge in human medicine and this problem may spill over to the veterinary field. Moreover, there is growing evidence of methicillin resistance in other staphylococcal species and even then in some non-related pathogens. So it is essential for the veterinary profession to carry out regular reappraisals of its infection management procedures.

The numbers of MRSA infections

reported in animals is still relatively low compared to the frequency of human cases, noted Tom Maddox, from the National Centre for Zoonosis Research at the University of Liverpool. However, university centres like the Liverpool Small Animal Hospital are reporting a year-on-year increase in cases and it is likely that most general practitioners will encounter a case at some point.

Mr Maddox advised submitting samples for microbiological analysis from any cases of persistent infection which have failed to respond to empirical antibiotic treatment, especially if fluoroquinolone or beta-lactam antibiotics have been used. Practitioners should be particularly suspicious of infection in cases of animals that have received long-term antibiotics, are immunosuppressed as a result of disease or treatment, have postoperative or traumatic wounds, or have been in contact with a known human or animal carrier of MRSA.

### Diagnosis and treatment

Laboratory diagnosis of MRSA resistance is straightforward and it may be worthwhile for the practitioner to call the lab to discuss the results and their implications for future treatment. When MRSA is confirmed, the bacterium should be considered resistant to all penicillins, beta-lactams, cephalosporins

and related antibiotics, irrespective of any reported sensitivity. Other familiar agents such as tetracyclines, potentiated sulphonamides and often gentamicin are usually effective in treating small animal isolates. For superficial or localised infections, practitioners should consider topical therapies such as fusidic acid. They may also consider antibiotic-impregnated implants, and standard wound management procedures such as irrigation and debridement may be of value.

The prognosis in most cases is likely to be good although some may need prolonged treatment. Mr Maddox emphasised the importance of good communication with owners, to ensure that effective hygiene procedures are carried out and to identify any potential zoonotic risks, such as an immunocompromised family member or one about to undergo surgery themselves.

Using fluoroquinolone and some cephalosporin antibiotics in veterinary practice is particularly controversial following the UK Chief Medical Officer Liam Donaldson's warning that these products should be restricted for treatment of humans. However a blanket ban on veterinary use should not be necessary, argues Mark Doshier, from the Bella Moss Foundation. The foundation would certainly like veterinary surgeons to reduce their use of antibiotics generally, but these particular products should still have a role in small animal practice provided they are used responsibly. "They should not be used in any animal unless there is a clear indication that they will be effective," he suggests.

### Antimicrobial products

However the veterinary profession is on the back foot in its attempts to defend access to these groups of antibiotics. There is simply insufficient data to prove that current usage is safe and responsible, warned Dr Susan Dawson, also from the University of Liverpool. The only figures available are those from the Veterinary Medicines Directorate, whose last annual report in 2008 showed that while the overall therapeutic use of antibiotics in animals is declining, sales of

fluoroquinolones and cephalosporins are still going up. Most of these products are being used in livestock animal species but in 2007 a significant amount (33,621 kg) was used in non-food species.

There is a limited range of antimicrobial products available for use by veterinary surgeons; most of those are broad spectrum products and all the licensed preparations are also used in human medicine. So vets must be mindful of the impact of veterinary antibiotic use on the normal gut flora in patients, Dr Dawson warned. Antimicrobial resistance in non-pathogenic bacteria could act as reservoirs of genetic materials for later transfer to pathogenic species.

Prudent use of antibiotics is essential to avoid further restrictions on their availability for veterinary surgeons, an issue that has been taken on board in the livestock sector through the work of RUMA (the Responsible Use of Medicines in Agriculture Alliance). Its director, Dr Tony Andrews, described the changing attitudes towards antimicrobials in farm species over the past 10 years and the growing pressure from organisations like the World Health Organization for ever stricter controls.

The issues surrounding antibiotics use were essentially the same for every branch of the veterinary profession and the advice offered by RUMA was the same, irrespective of where the practitioner was working. Take full responsibility for prescribing antimicrobials, he warned. "Always be able to justify your choice – antibiotic use is no longer a right for a veterinary surgeon, it must be responsibly used. So please remember the RUMA mantra on antimicrobials – use as little as possible but as much as needed."

**SA vet viewpoint**

From my perspective as a purely small animal practitioner, I made a few observations of my own at the meeting. My feeling is that we are not entirely blameless on some issues which may have relevance to the rise of multi-resistant bacteria. Are there occasions, for example, when we are lured into trying out exciting new antibiotic

regimes and ignore those stalwarts of yesteryear which remain an effective part of our armamentarium? It is easy to be seduced by pharmaceutical advertising with its emphasis on products like the fluoroquinolones and cephalosporins.

Just as important, we must guard against financial considerations clouding our clinical judgement. We must ensure that we are never tempted to choose a new exciting high value drug ahead of a familiar old product that may be equally effective. Another potential sin which we must strive to avoid is laziness; the temptation to use a broad spectrum, catch-all therapy rather than opting for a specific treatment for the particular bacterium identified or strongly suspected.

Removing that particular hair shirt, there are others involved in the supply and use of veterinary medicines who should also consider whether the policies that they have adopted are always the most sensible ones under the circumstances. My feeling is that the regulators (chiefly Practice Standards Committee) also have a lot to answer for. There are issues we cannot ignore – practice inspections are aggressively enforcing the 28 day rule on using a vial of antibiotic once it has been breached. Add to this the increasing difficulty in obtaining injectable antibiotics in single-patient doses and that adds up to produce an insidious pressure to overuse rather than waste a valuable product.

I would argue that these problems provide further evidence, if that were needed, of the dangers of our profession becoming overreliant on the sales of products rather than our hard won knowledge. We are bombarded with advice and literature trying to force us to adopt a retail mentality when we should be focussing our efforts on earning professional fees from the advice that we are able to offer.

For full access to the BSAVA's MRSA Guidelines and Frequently Asked Questions, visit the Advice section at [www.bsava.com](http://www.bsava.com) ■

**Top tips**

- 1** Good hand hygiene is the simplest and most important step to reducing bacterial transmission
- 2** Thorough cleaning of the practice premises is also essential. Identify key transmission areas, e.g. keyboards, door handles, otoscopes
- 3** Effective protective clothing, e.g. theatre scrubs, masks, gloves
- 4** In cases of chronic infection, ensure that samples are taken for bacterial typing and sensitivity testing
- 5** Rely on good surgical asepsis and only give prophylactic antibiotics in the rare, high-risk cases
- 6** Use long established, low-tech antibiotics such as potentiated sulphonamides wherever possible
- 7** Use the minimum possible dose to achieve the stated therapeutic goals (i.e. RUMA's "Use as little as possible but as much as needed")
- 8** Ensure as far as possible that the client complies with the dosing instructions
- 9** Check that there are no potentially vulnerable family members if a dog or cat develops MRSA
- 10** Use topical antibiotics and non-antibiotic approaches (e.g. debridement and wound irrigation) wherever possible
- 11** Be aware of, and test for, the risk of resistance developing in other bacterial species
- 12** Be open, honest and realistic should MRSA be identified