

The Three Colleges Symposium on Antimicrobial Resistance held on 2 October 2012

Antimicrobial Resistance in Human and Veterinary Medicine – One Medicine, One Problem?

Providing an evidence-base for a rational debate

Communiqué

Based on the premise of 'One Medicine, One Problem', the priorities, opportunities and challenges in tackling antimicrobial resistance (AMR) in human and veterinary medicine, were discussed by the Royal College of Veterinary Surgeons, in partnership with the Royal College of Pathologists (RCPATH) and the Royal College of Physicians (RCP), and in association with the Health Protection Agency (HPA), the Veterinary Medicines Directorate (VMD) and the British Society for Antimicrobial Chemotherapy (BSAC) at a one-day symposium in London, held at the RCP. This communiqué summarises the conclusions from the invited expert speakers' talks [see link below] and the audience discussion.

1. Antimicrobial resistance (AMR) describes a state in which a bacterium is insensitive to drugs that would normally kill other bacteria. This state may be innate or acquired and the clinical consequence of this is a reduced ability to treat infections with such organisms.
2. The issue poses worldwide concern. Drug resistance presents an ever-increasing global public health threat that involves all major microbial pathogens and antimicrobial drug classes. AMR could potentially take us back to a pre-antibiotic era where treatments for common infections are absent (or extremely expensive) and procedures such as organ transplantation, cancer chemotherapy and major surgery are compromised.
3. The issue of acquisition, evolution and transmission of AMR is complex and involves human and domestic animal populations (both food animal species and non-food companion animal species), but also wildlife and the environment. It is important to understand how these factors interact, particularly with increasing international movement of people, food and animals.
4. We need to develop strategies to extend the 'shelf-life' of current antibiotics and stimulate the development of new products in the pharmaceutical market, for example, by offering extended patent life for new antimicrobial drugs. The meeting deliberately focused on debating policies for best use of the existing products and did not consider the latter in depth.
5. Four main processes are involved in the evolution of resistance: emergence, adaptation, transmission among bacteria, and transmission in the community.

in association with the Health Protection Agency

6. There are some bacteria which only infect animals, and there are examples amongst them of strains where AMR has emerged, although the clinical consequences of AMR in purely veterinary infections are as yet limited. Conversely, there are bacteria confined to the human population in which AMR has evolved (by definition) from human use and which present serious clinical problems (for example, human tuberculosis). Finally, there are zoonotic bacteria, which infect or colonise humans and animals (for example, *E. coli*), in which AMR may have originated in either animals or humans, and then resistant strains have passed from animals to humans (for example, non-typhoidal Salmonella) or from humans to animals (for example, some MRSA in pets).
7. Inappropriate antibiotic use is an important cause of the increased prevalence of antibiotic resistance genes. Voluntary decreases in usage at hospital level can be achieved without detriment to health, as shown by recent surveys from the Scottish NHS. Equally, Denmark has been successful in eliminating the use of fluoroquinolones in the poultry and pig industries without detriment to poultry or pig productivity. Unfortunately, this significant achievement was coincident with an increase in use of the same antibacterial for humans and an increase in AMR.
8. Resistance is usually cumulative and irreversible, ie usually there is no fitness cost associated or there has been compensation to overcome the cost. Consequently, in the absence of selection pressure, resistant strains will persist and will then be disseminated by global movement (usually by people).
9. Best practice in antimicrobial use is critical. Correct dosages for the weight of patient (human and animal) and observance of duration of treatment are critical to reduce the possibility of AMR emergence.
10. Both the veterinary and human field could profit from electronic prescribing systems, allowing the volume of usage to be accurately monitored and large amounts of data to be shared and interpreted at global level.
11. In considering restrictions in veterinary use, account should be taken of the differences that exist between companion animals and livestock. Whilst it is true that companion animals have a role to play in the transmission of antimicrobial resistance, they present a smaller threat to the safety of the foodchain when compared to livestock, and their health and welfare can be seriously jeopardised if a veterinary surgeon's antibiotic prescription rights are limited.
12. Responsible use of antibiotics will be fostered by providing GPs and veterinary surgeons with rapid bedside/penside diagnostics that can distinguish viral and bacterial infections and determine their species and antibiotic sensitivity.
13. Policies that promote the transfer of knowledge between research laboratories and clinical practice can effectively contribute to a future where molecular and microbiological data are commonly used to inform therapeutic choices, promoting best use of the available drugs.

in association with the Health Protection Agency

14. Resistance can occur anywhere on the globe, but will be most likely to appear where the use and misuse of antibiotics is greatest. In an increasingly connected world, it is evident that any measures need to tackle global use. The probability that selection for resistance will occur where antimicrobial usage is highest and least controlled, coupled with unprecedented mobility of humans, means that, whether AMR originates from animal use or human use, the threats in Britain and in Europe will often emanate from outside. Strategies in the UK in human and veterinary medicine must recognise this. As well as pursuing all reasonable measures to reduce emergence and proliferation of AMR in the UK, our national strategies need to consider measures to reduce, identify (through surveillance) and deal with imported problems, be they in humans, food or animals.

Acknowledgements

Financial support for this symposium is gratefully acknowledged from the Veterinary Medicines Directorate, the RCVS Charitable Trust, the Wellcome Trust, and the BSAC.

Authors

This communiqué is written and issued by the Scientific Advisory Committee of the symposium, comprising Professor the Lord Trees and Dr Bharat Patel (co-organisers), Professor Malcolm Bennett, Professor Peter Borriello, Professor Stephen Gillespie, Professor Peter Hawkey, Professor Duncan Maskell, Professor Laura Piddock and Professor Mike Sharland.

Links

Website: <http://www.rcvs.org.uk/news-and-events/past-events/joint-symposium-on-antimicrobial-resistance/>

Programme: <http://www.rcvs.org.uk/document-library/amr-symposium-programme/>

AMR Symposium Report: <http://www.rcvs.org.uk/document-library/amr-symposium-report/>