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Emergence of plasmid-mediated colistin resistance mechanism MCR-1 in animals and human beings in China: a microbiological and molecular biological study. Yi-Yun Liu *et al.* *Lancet Infectious Diseases* November 19 2015

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This is a worrying report as polymyxins are often the last resort antibiotic to treat serious infections by multiple drug-resistant bacteria. However, concern must be tempered, as there is no evidence so far to show that patients with such drug-resistant infections will be difficult to treat. This will depend on the type of infection, the patient and whether there are alternative treatment options available. Bacteria are able to transfer resistance from one bacterium to another by exchanging circular pieces of DNA called plasmids that carry the new resistance gene. In this case, the transmissible plasmid that carries the polymyxin-resistance gene does not have any other drug-resistance genes on it. So in the absence of the bacterium containing another plasmid with resistance genes or resistance mutations on its chromosome and/or the polymyxin-resistance plasmid picking up other resistance genes, then there are antibiotics that could be used to treat an infection in patients with this type of resistance.

Equally worrying is that this type of resistance can be easily transferred between bacteria and as we know from other types of drug-resistance, this likely paves the way for it to spread throughout the world. Therefore, there is concern that this plasmid could get into bacterial strains that are already multi-drug resistant, such as carbapenemase-producing Enterobacteriaceae (e.g. *E. coli* or *Klebsiella*) and cause an infection – this could make a truly untreatable infection.

As this week is World Antibiotic Awareness Week, the timing of publication could not be more appropriate. The finding that this type of resistance can be shared by different bacteria, irrespective of whether from food, an animal or a person is further evidence that the same drugs should not be used in veterinary and human medicine. All use of polymyxins must be minimised as soon as possible and all unnecessary use stopped.

There are some antibiotics and combinations of drugs that could be used to treat infections by bacteria with the polymyxin-resistance plasmid, so hopefully the post-antibiotic era is not upon us yet. However, this is a wake-up call to the world to make available much more funding to find new treatments – some compounds with good activity in the test tube offer promise, but without funding to test them to ensure their safety in people and how to minimize resistance emergence, problems with difficult or untreatable infections will become more common.

Now more than ever we need rapid accurate diagnostics to indicate when antibiotics should be used, so that doctors use these drugs only when really needed. Until that time global surveillance for this type of resistance is essential so that infection control measures can be put in place to prevent the spread of these polymyxin-resistant bacteria.

This report adds to the never-ending list of ways bacteria become drug-resistant. However, until new treatments are available, we must use the knowledge we have to start 'stemming the tide of AMR' now – good infection control to prevent the spread of antibiotic resistance combined with only using antibiotics when needed (antimicrobial stewardship). We hope that our MOOC produced in partnership with the University of Dundee (https://www.futurelearn.com/courses/antimicrobial-stewardship) will help those who prescribe antibiotics to use them wisely. For those interested in the global effort against AMR may wish to look at the supplement about antibiotic-resistance published in the UK Newspaper, The Independent on November 18th 2015.