b Global spread of antimicrobial resistance to colistin

Antibiotic resistance has increased in the last two decades and very few new antimicrobial agents have been discovered. With the limited range of antimicrobials available to treat pan-resistant organisms, clinicians have become increasingly dependent on colistin, a polymyxin antibiotic discovered in 1949. Colistin acts on the bacterial cell membranes to increase permeability, resulting in bacterial cell lysis. Colistin also neutralizes endotoxin by binding to the lipid A component of lipopolysaccharide molecules of Gram-negative bacteria. Colistin is a 'last resort' drug and clinicians avoid using it because of potential renal toxicity.

Chromosomally-mediated mutations that confer resistance to colistin had been reported previously. However, researchers led by Yi-Yun Liu from the South China Agricultural University, recently discovered plasmid-mediated resistance to colistin on a named MCR-1, on plasmids. Because plasmids are mobile, DNA conferring resistance can be easily copied and transferred between different bacteria of animals and humans. The increasing use of colistin to treat multidrug-resistant Gram-negative bacterial infections has led to the emergence of colistin resistance in *Klebsiella pneumoniae* in several countries worldwide. Several factors are reportedly associated with colistin resistance, including inappropriate use of colistin and patient-to-patient transmission. International co-operation and global surveillance for MCR-1 resistance is now essential to try to prevent the spread of polymyxin-resistant bacteria. In South Africa, regulation of antibiotic use in agriculture and human health should be implemented based on South African AMR strategic framework.

Reference: Bogdanovich, T., Adams-Haduch, J. M.,Tian, G. B., Nguyen, M. H., Kwak, E. J., Muto, C. A., Doi, Y. Colistin-resistant, *Klebsiella pneumoniae* carbapenemase (KPC)-producing *Klebsiella pneumoniae* belonging to the international epidemic clone ST258. Clin Infect Dis: 53: 4: 373-6

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