Which antibiotic combination regimen might be effective against this antibiotic resistant bacterial strain?

Wei Wei Thwe Khine

Nowadays, bacteria causing severe infections have developed antibiotic resistance and spread around the world, in part due to travelling. Among them, *Klebsiella pneumoniae* is one of the more common infectious agents. As infections with antibiotic resistant bacteria have increased, the occurrence of infection-associated deaths due to lack of treatment options is threatening around the world. Among them, *Klebsiella pneumoniae* strains producing NDM enzymes that make most commonly used antibiotics ineffective (NDM, New Dehli Metallo-beta-lactamase, named from the first reported case which came from India) is becoming a danger around the world because of their broad resistance profiles. Moreover, many pharmaceutical companies are not interested in searching new antibiotics anymore. Very few new antibiotics are still under clinical trial so that new antibiotic cannot be available in near future. So, the importance of studying the emergence and determinants of antimicrobial resistance and the need to devise appropriate strategies for their control must also be the critical concerns. Colistin had been abandoned long time ago because of its nephrotoxicity side effect. These days, increasing amount of antibiotic resistance strains makes colistin becomes the last resort antibiotic and the current purification technique is promising in low toxicities. Combination antibiotic therapy has long been used to improve clinical outcomes; particularly in patients associated with high rate of morbidity and mortality such as severe pneumonia infections. Clinical data have revealed combination therapy including colistin, meropenem, and rifampicin is effective for severe infections with carbapenemase-producing *Klebsiella penumoniae*. In our report, we found that colistin and rifampicin in combination, as well as triple combination of colistin, rifampicin and meropenem were effective against NDM-producing *Klebsiella pneumonia*. More studies will be needed to evaluate if this antibiotic combination therapy is effective, also in a clinical situation, but in many cases laboratory experiments will be the only information prescribing physicians have to go on.

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Biology Education Centre and Department of Medical Sciences/ Infectious Diseases/ Antibiotic Research Unit, Uppsala University

Supervisors: Pernilla Lagerbäck and Thomas Tängden