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Paper Poster Session
Emergence and worldwide outbreaks of carbapenemase-producing bacteria

The first outbreak of a New Delhi-metallo-beta-lactamase (NDM)-producing organism in a New Zealand healthcare facility

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Background: Carbapenemase-producing Enterobacteriaceae (CPE) are rare in New Zealand (NZ). Between 2009 and 2014, only 35 isolates were confirmed by the ESR national reference laboratory. During this period, almost all patients with CPE had recently been hospitalised, or at least travelled, in countries with a high prevalence of CPE. Notably, there had been no evidence of any transmission of CPE in a NZ healthcare facility. We report the first outbreak of an NDM-producing organism, specifically NDM-5 producing *Klebsiella pneumoniae*, identified in a NZ healthcare facility.

Material/methods: We defined a case as any patient who was currently or had previously been an inpatient in our tertiary-level hospital from whom NDM-5 producing *K.pneumoniae* was isolated. A multi-disciplinary outbreak control team was set up to instigate control measures, carry out contact screening and undertake an epidemiological investigation into the outbreak source.

Results: The first isolate was from a faecal sample from a haematology patient which was sent for screening for multi-drug resistant organisms at the end of September 2015. Over the next three weeks a further two cases were found. An outbreak was declared and screening of close hospital contacts was undertaken. This screening identified one further case who was also a haematology patient. The first case had a history of travel to the UK and Singapore but the others had no recent travel history. The organism was isolated on screening samples from three cases and a catheter urine sample from the remaining case. All cases were considered to be colonised rather than infected. All isolates were identified as *K.pneumoniae* by MALDI-TOF mass spectrometry and had the same susceptibility pattern: resistant to all beta-lactams, gentamicin, fosfomycin and tigecycline, and susceptible only to amikacin (MIC <4 mg/L) and colistin (MIC <1 mg/L). Sequencing identified the NDM-5 gene in all isolates and the isolates were indistinguishable by pulsed field gel electrophoresis typing. The age range of cases was 48-85 years. All cases had significant underlying medical problems and had previously received broad-spectrum antibiotics. Epidemiological investigation into the source is currently ongoing and the only link identified so far is that two of the patients were haematology inpatients.

Conclusions: This is the first outbreak of its kind in NZ and the epidemiological investigation is currently ongoing. The NDM-5 carbapenemase gene was first isolated in an *Escherichia coli* ST648 isolate in the UK in 2011 in a patient who had received healthcare in India. To date only a very small number of cases of NDM-5 producing *K.pneumoniae* have been described internationally, including an outbreak involving five cases in Denmark where the source was not found. This outbreak has implications for CPE screening and infection control practice in NZ.