Development of a carbapenem-resistant Enterobacterales patient surveillance and response program

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Carbapenem-resistant Enterobacterales (CRE) are a group of bacterial species (order Enterobacterales; EB) that are resistant to carbapenems, an antimicrobial of last resort. One mechanism of resistance is via carbapenemase production (CPE), a subset of CRE, and is the resistance mechanism of greatest concern. CRE is an emerging problem as outbreaks in human and veterinary medicine rise. There have not yet been any reports of CRE in Canadian veterinary teaching hospitals (VTH), however rising veterinary cases worldwide indicates a need for developing surveillance and outbreak prevention strategies. The aim of this study was to develop a patient surveillance program for CRE and to determine the prevalence of CRE carriage in patients at the Atlantic Veterinary College (AVC)-VTH. Naturally voided fecal samples from canine, feline, and equine patients at AVC-VTH were collected between 09 June-30 July 2025. Fecal samples were incubated in a selective enrichment broth and plated onto MacConkey agar supplemented with 0.125 mg/L meropenem (Mac+M), to detect EB with reduced susceptibility to carbapenems. MALDI-TOF MS was used to identify bacterial isolates. Recovered EB were characterized by Antimicrobial Susceptibility Testing (AST) and the modified Carbapenem Inactivation Method (mCIM). A total of 64 samples were processed from 57 unique patients (32 canines, 21 equines, 4 felines). Thirteen of the 64 samples had EB isolated on Mac+M (20.3%, 95% CI [11.3-32.2]), with isolates recovered from all three animal species. Of these 13 samples, 17 EB species were isolated. One canine *Morganella morganii* isolate was found to be resistant to meropenem on AST, but was negative on mCIM, making it a CRE but not a CPE. The fecal carriage of EB with reduced susceptibility to carbapenems in veterinary patients highlights the importance of implementing CRE identification and prevention strategies in veterinary hospitals.

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