

Detection of the Minimum Inhibitory Concentrations for Meropenem in Resistant Coliform Isolates at National Cancer Institute Maharagama

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Carbapenem Resistant Enterobacteriaceae is a health problem worldwide due to overuse and misuse of antibiotics. The determination of minimum inhibitory concentration (MIC) using broth micro dilution (BMD) is the gold standard in defining optimal treatment and identifying microbial resistance. This determined the prevalence of Meropenem resistance among Coliforms and the MICs for Meropenem resistant Coliform isolates using several methods at the National Cancer Institute, Maharagama. Nine hundred and seventy-seven isolates were collected from blood, urine, sputum, and pus samples during September 2020-January 2021. Meropenem resistance was detected by the disc diffusion method in 332 Coliforms and tested for MICs using BMD. For the isolates recovered from blood, a comparison of MICs between the VITEK2 and BMD methods was also performed. Meropenem resistance was 67.2% (n=332) among Coliforms. MIC was performed on 87 Meropenem resistant Coliforms. Of these isolates, 85.1% (n=74) were resistant ($\geq 4\mu\text{g/ml}$), 13.8% (n=12) were intermediate ($2\mu\text{g/ml}$) and 1.19% (n=1) was sensitive ($\leq 1\mu\text{g/ml}$) by BMD method. Statistically significant differences were noted between the number of resistant isolates by disc diffusion and BMD methods ($p=0.00$) and MIC results obtained for blood isolates by BMD and VITEK2 methods (Kendall's τ beta $p=0.001$). In Sri Lanka, the determination of Meropenem usage is based on the results obtained by the disc diffusion method. The study emphasizes the limitations of using the disc diffusion method in situations where the prevalence of Meropenem resistance is high. This is of great clinical value as Meropenem is a broad-spectrum antibiotic and it is used for treating life-threatening infections.

Keywords: meropenem resistance, minimum inhibitory concentration