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The need for control of antibiotics for the prevention and management of antimicrobial resistance (AMR)

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Abstract

Background: Antimicrobial resistance (AMR) is of significant global concern. It occurs when pathogens become resistant to drugs used to treat them due to misuse and overuse of antimicrobials. This makes treating infections more difficult and expensive. This study aims to characterise resistance patterns in two antimicrobial resistant organisms isolated at Northern Provincial Hospital Laboratory (NPHL) from 2016-2022. It is hoped that by characterising the prevalence of these organisms, processes can be put in place to help limit the problem in Vanuatu.

Method: Retrospective study. Laboratory technicians isolate AMR organisms (Methicillin Resistant Staphylococcus aureus (MRSA) and Extended spectrum beta lactamases (ESBL) bacteria from different patients' samples that were determined using antibiotic sensitivity test. MRSA were detected using cefoxitin disk. ESBL producing Escherichia coli, Klebsiella pneumoniae, Enterobacter spp., Citrobacter spp. and Proteus spp. were confirmed by double disk diffusion. The growth inhibitory zones were measured via cefotaxime and ceftazidime disks with and without clavulanic acid. Data were collected from NPHL Registry book from 2016-2022 and were further analysed using Microsoft word Excel sheet.

Results: A total of 1661 pathogens were isolated. Twenty-two (1.3%) were found to be anti-microbial resistant organisms. There were 5 MRSA, and 17 ESBL (ten Escherichia coli, three Klebsiella pneumoniae, two Enterobacter spp., one Citrobacter spp. and one Proteus spp.) All MRSA showed resistance to Cefoxitin. Whilst all ESBL cases showed resistance to Ceftriaxone, Augmentin, Ampicillin, Gentamicin, Ciprofloxacin, and Doxycycline.

Discussion: Antimicrobial resistance is an increasing global problem. These data show growing evidence for the presence of these organisms in Vanuatu. This could have significant consequences for cost effective clinical management and patient outcomes. It is suggested that expanding scope of Microbiology Laboratory testing, strengthening communication channels between clinicians, infection prevention and control (IPC) and improving guidelines around the use of anti-biotics is necessary to control this emerging problem.