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CORRELATION BETWEEN MULTI-DRUG RESISTANT ORGANISMS AND ANTIMICROBIAL USE AMONG IN-HOSPITAL PATIENTS AT A TERTIARY HOSPITAL IN THE PHILIPPINES FROM JULY 2010 TO JUNE 2014

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Background Infections caused by multi-drug resistant organisms (MDRO) are associated with higher morbidity, mortality and healthcare costs. WHO recommends hospitals to monitor antimicrobial use to reduce MDRO prevalence.

Objectives This 4-year study described the annual MDRO prevalence, the annual antimicrobial consumption and their relationship.

Methods Annual antibiogram of Methicillin Resistant Staphylococcus aureus (MRSA), ESBL Escherichia coli, ESBL Klebsiella pneumoniae, and MDR Pseudomonas aeruginosa were evaluated. Data on annual consumption (Defined Daily Dose) of selected antimicrobials were analyzed. Linear regression was used to analyze trend in antimicrobial consumption and MDRO prevalence. Pearson's correlation coefficient was used to determine their relationship. A p -value < 0.05 and $r^2 > 0.5$ were considered statistically significant.

Result There was a significant increase in annual patient days while annual antibiotic usage decreased. The most common antibiotic class used in descending order were cephalosporins, beta-lactam/beta-lactamase inhibitors and fluoroquinolones. Individually, piperacillin-tazobactam, ceftriaxone and ertapenem use significantly increased. The prevalence of ESBL E.coli significantly increased, ESBL K.pneumoniae and MRSA remained stable and MDR Paeruginosa significantly decreased. The

increased consumption of cefazolin, cefepime, meropenem and cotrimoxazole were positively correlated with increased ESBL *E. coli* prevalence. The higher use of antimicrobials without anti-Pseudomonal activity ceftriaxone and ertapenem versus piperacillin-tazobactam were positively correlated with decreased MDR *Paeruginosa* prevalence. MRSA prevalence positively correlated and mirrored linezolid usage as it is a 2nd line agent for it. The absence of increase in ESBL *K.pneumoniae* prevalence may be due to decreased fluoroquinolone use.

Conclusion This study at our institution found that antimicrobial use did not increase despite increase in annual patient days. The prevalence of ESBL *E.coli* increased, ESBL *K.pneumoniae* and MRSA remained stable, MDR *Paeruginosa* decreased. A positive correlation between antimicrobial use and MDRO prevalence was established. Establishing an antibiotic restriction program at our institution is recommended to address the significant prevalence of MDRO.

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