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Prevalence and Distribution of Multidrug-Resistant Organisms in selected units of a Tertiary Care Centre in South India: A Cross-Sectional Study

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INTRODUCTION

Multidrug-resistant organisms (MDROs) such as CRE, CRAB, CRPA, MRSA, and VRE are significant causes of healthcare-associated infections, particularly in high-risk areas. These pathogens are associated with increased morbidity, limited therapeutic options, and prolonged hospital stays.

AIM

This study was conducted to assess the prevalence and distribution of MDROs in selected critical care units and corresponding wards at a tertiary care centre in South India, as part of an ICMR-funded extramural project on antimicrobial resistance surveillance.

METHODOLOGY

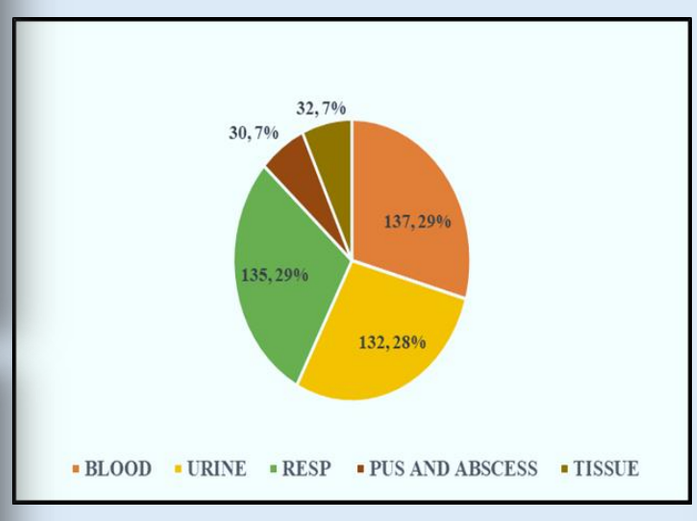
A prospective cross-sectional study was conducted at Amrita Institute of Medical Sciences, Kochi, from October 2023 to March 2025, in which all culture reports of selected specimen types (blood, urine, respiratory samples, tissue, and pus/abscess) were prospectively collected from the hospital information system. The data included reports from two surgical ICUs, one medical ICU, and their respective wards. The presence of MDROs including CRE, CRAB, CRPA, MRSA, and VRE was recorded based on final microbiology reports and analysed according to specimen type and location of origin (ICU vs. ward).

RESULTS

Out of 7,682 clinical samples processed, 2,065 (26.88%) showed microbial growth. Of the 466 Carbapenem-resistant isolates identified, *klebsiella pneumoniae* was the most common (53%), followed by *E. coli* (18.66%), *Acinetobacter baumannii* (13.7%), and pseudomonas aeruginosa (12%) .Among 54 staphylococcus aureus isolates, (46.29%) were MRSA and out of 81 enterococcus spp. isolates, (22.22%) were VRE. Blood specimens showed the highest rate of carbapenem resistance, followed by respiratory, urine, tissue and pus/abscess samples The majority of carbapenem-resistant isolates were identified in ICU settings (74.2%), while the remaining 25.75% were from wards.

Distribution of Multidrug-Resistant Organisms		
Category	**Total**	**Percentage (%)**
Total Carbapenem Resistant isolates	466	22.5
CRE (E coli, Klebsiella pneumoniae, Serratia, Citrobacter, Enterobacter)	346	74.24
CRAB	64	13.7
CRPA	56	12
MRSA	25	46.29
VRE	18	22.22

MRSA Distribution by Unit and Specimen Type		
Total MRSA isolates	**15 (60%)**	**10(40%)**
Blood	5 (33.33%)	1 (10%)
Urine	2 (13.33%)	0 (0%)
Respiratory	6 (40%)	1 (10%)
Pus and abscess	2 (13.33%)	5 (50%)
Tissue	0 (0%)	3 (30%)



Distribution of Carbapenem-Resistant Isolates by Unit and Specimen Type		
Specimen Type	**ICU(n,%)**	**Ward(n,%)**
Total CR isolates	**346 (74.24%)**	**120 (25.75%)**
Blood	120 (34.68%)	17 (14.16%)
Urine	77 (22.25%)	55 (45.83%)
Respiratory	112 (32.36%)	23 (19.16%)
Pus and abscess	18 (5.2%)	12 (10%)
Tissue	19 (5.49%)	13 (10.83%)

VRE Distribution by Unit and Specimen Type		
Total VRE isolates	**13(72.2%)**	**5(27.77%)**
Blood	7 (53.84%)	2 (40%)
Urine	5 (38.46%)	3 (60%)
Respiratory	0 (0%)	0 (0%)
Pus and abscess	1 (7.69%)	0 (0%)
Tissue	0 (0%)	0 (0%)

CONCLUSION

The findings of this study reflect ongoing antimicrobial resistance patterns and underscore the importance of sustained microbiological surveillance and antimicrobial stewardship programs in tertiary care settings.

The high prevalence of MDROs, particularly in intensive care units, reinforces the critical importance of robust infection control practices and routine monitoring to support informed clinical decision-making and improve patient outcomes.