

7.0 CONCLUSION

The present study has highlighted the high prevalence of carbapenem resistance among Gram-negative isolates in our hospital, along with the very high rates of simultaneous resistance to other antimicrobials in such strains with exception of tigecycline and colistin.

Carbapenem-resistance detected by the Kirby Bauer disc-diffusion method should be confirmed with Etest or broth dilution, if the antimicrobial discs used for the Kirby Bauer method are of the ordinary heat-labile type.

All carbapenem-resistant GNB isolates were positive for the blaNDM-1 carbapenemase gene. Roughly a sixth of carbapenem-resistant strains encoded more than one carbapenemase, over and above blaNDM-1. In addition to the carbapenemase genes, 14.6% isolates were also positive for efflux pump activity.

No phenotypic method of carbapenemase detection had sensitivities beyond 90% in our hands when compared with PCR for carbapenemase gene detection.

The universal presence of blaNDM-1 in our carbapenem, resistant isolates along with similar or identical findings in other places in Asia, is worrisome because Ambler Class-B metallo- β -lactamases are not inhibited by the newly developed β -lactamase inhibitors, avibactam and relebactam, which target serine carbapenemase of Ambler Class A and C only. This emphasizes the need to develop inhibitors of Ambler Class B carbapenemases. Fortunately, cyclobutanone and bisthiazolidine derivatives have displayed promising activity against metallo- β -lactamases and it is hoped that structural modifications will improve their activity to significant level in the near future.

Therefore, it is important to monitor the nature of carbapenemases to provide impetus to the development of newer antibiotics, and also guide their subsequent use,

especially on an empiric basis. Since it is neither feasible nor economical to do this on all carbapenem resistant isolates, nationally coordinated surveys must be done periodically with significant numbers of geographically representative isolates to maintain an up to date picture of resistance mechanism in different parts of countries.