CHAPTER – 8

CONCLUSIONS

➢ Carbapenemase production occurs more commonly in non fermenting Gram negative bacilli (NFGNB) than in Enterobacteriaceae. They are associated with a wide variety of infections in the critically ill patients

➢ In Enterobacteriaceae

   NDM is the most common mediator of carbapenem resistance

   NDM producing Enterobacteriaceae remain susceptible to carbapenem as determined by disc diffusion or MIC method. Hence it is mandatory to screen all the III generation cephalosporin resistant Enterobacteriaceae for the production of NDM

   OXA -181 is not a major mediator of carbapenem resistance in Enterobacteriaceae

   KPC and other MBLs (IMP,GIM, SIM, SPM) were not encountered in this study

   The phenotypic screening test perform poorly in the presence of NDM in Enterobacteriaceae

   There is universal susceptibility to colistin and tigecycline among carbapenemase producers

   There is extensive clonal diversity among NDM producing *Escherichia coli* and *Klebsiella pneumoniae*
In *Pseudomonas aeruginosa*

- VIM type of MBL is the most common mediator of carbapenem resistance
- NDM and IMP contributes only to a minor proportion of carbapenem resistance
- Other MBLs namely SIM, GIM, SPM were not encountered
- The phenotypic screen test have good sensitivity in the presence of carbapenemases in *P. aeruginosa*
- 8.2% of *P. aeruginosa* exhibited resistance to colistin
- There is extensive clonal diversity among VIM producing *P. aeruginosa*

In *Acinetobacter baumannii*

- OXA type enzyme is encountered in a vast majority of carbapenem resistant *A. baumannii*
- VIM type of MBL contributes to a substantial proportion of carbapenem resistance
- Unlike Enterobacteriaceae, NDM was not a major mediator of carbapenem resistance in *A. baumannii*
- Most isolates harbour multiple types of carbapenemase encoding genes.
- The phenotypic screen test employed have 100% sensitivity in the presence of OXA and MBLs in *A. baumannii*
Emerging resistance to tigecycline (6.9%) and colistin (2.6%) is a cause for concern

There is clonal diversity among carbapenemase producing A. baumannii

- PCR remains the gold standard for the accurate detection of carbapenemase producers.
- Dissemination of strains producing carbapenemase should be curtailed with stringent infection control measures and judicious use of antimicrobial.
- Though this study retrospectively analysed the risk factors for infection with carbapenemase producing Gram negative bacterial infections and its impact on outcomes, prospective case controlled studies have to be undertaken for clear understanding and in-depth analysis.
- The non-enzymatic mechanisms contributing to carbapenem resistance have to be characterized and their role evaluated in clinical settings.