Conclusion
CONCLUSION

- An epidemiology of trap secretion specimens for a decade period suggests an enormously high infection rate in these specimens in the study hospital. With an overall incidence of 24.50%, *Acinetobacter* is observed as one of the major contributor to nosocomial respiratory infections in patients in ICUs with intubation or on mechanical ventilation. *Acinetobacter* was the third most prevalent pathogen contributed 19% of the total isolates recovered from trap secretions. This confirms the growing importance of *Acinetobacter* as a nosocomial pathogen causing respiratory infections in the ICUs of the hospital.

- Identification of all the study isolates of *Acinetobacter* recovered from trap secretions as *Acinetobacter baumannii* suggests it as the predominant species involved in the nosocomial respiratory infections.

- None of the antibiotic has proved to be the only promising anti-*Acinetobacter* agent. Only Imipenem and Ampicillin-Sulbactam could retain their activity to a certain extent against this organism. The resistogram depicts all the *Acinetobacter baumannii* strains as 'multi-drug resistant' phenotypes. The situation like this often affects the management of patients in the ICUs and circumstance may impose to change infection control strategies of the hospital.

- Antibiotyping suggested 32 antibiotypes, where majority of *Acinetobacter baumannii* study isolates showed common pattern as 'resistant to all antimicrobials' tested. This represents 'pan-drug resistant' phenotypes, which may reflect the endemic nature of MDR *Acinetobacter baumannii* strains in the hospital environment. Dominance of 'pan-drug resistant' phenotypes may simulate 'end of drug' situation for this organism in near future. Spread of these organisms in the community will lead into serious consequences as far as antimicrobial chemotherapy is concerned.

- The plasmid analysis indicated 86 different plasmid profile patterns in *Acinetobacter baumannii* strains. The presence of the *Acinetobacter baumannii* strains with common plasmid patterns during the study period suggests perseverance of these strains in the hospital premises. Therefore, plasmid profile may prove an important step to trace epidemic / endemic strains and may help to control the outbreaks of the infection. The knowledge of plasmid profiles was the necessity for evaluation of plasmid mediated extended-spectrum β-Lactamases in the study isolates.

- More than 90% incidence of β-Lactamases among the isolates of *Acinetobacter baumannii* in the present study may indicate an intrinsic nature of these enzymes in this organism. The phenotypic evidence of ESBL production in 11.54% strains
suggested an increasing trend of ESBL production in this organism, and can be an alarming situation for the healthcare personnel.

- The identification of representative strains of *Acinetobacter baumannii* by 16S rRNA gene analysis, confirming their phylogenetic relatedness is supportive to their identification with mini-API system.

- Chromosomal PER-1 is the predominant ESBL type in *Acinetobacter baumannii* isolates included in molecular characterization. The presence of *bla*<sub>PER-1</sub> gene is an important evidence of clonal dissemination of ESBL producing *Acinetobacter baumannii* in ICU patients. The presence of PER-1 ESBL in the strains isolated at different time intervals during the decade may suggest an endemic character of this strain in the hospital environment.

To the best of our knowledge, there is no report on presence of PER-1 type ESBL in *Acinetobacter* sp. from India. This is the first report from the Western region of India, demonstrating PER-1 type ESBL in *Acinetobacter baumannii* isolates from trap secretions, and their epidemiologic feature. This data can give a new insight to define 'Infection Control Strategies' for this regional tertiary care hospital.