CHAPTER 6

CONCLUSION

6. Conclusion:

Antibiotic resistance in microorganisms has become a critical heath issue these days and evolved to become a worldwide health threat. Over a decade, the resistance level of bacteria has increased many folds due to various factors, accounting to added pressure on the environmental resistome. It is known that these gene cassettes contain a series of drug resistance genes which are functional under a common promoter. Thus exposure to any of the antibiotic to the bacterial strain is believed to induce the activity of whole gene cassette.

Our work was designed to analyze the whole gene cassette and to find out the types of arrangement is predominant in this area and their role in antibiotic resistance. Also an attempt was made to investigate a phenotypic screening marker for early detection of intgeorn mediated antibiotic resistance.

The combination of trimethoprim and sulfamethoxazole commonly known as co-trimoxazole is the most effective drug used in the treatment of urinary tract infection. However, emergence of resistance has limited the treatment option to a great extent. A very little molecular data on this aspect is available from this part of the country. The present study is a source of knowledge dealing with molecular basis of integron mediated gene transfer and antibiotic resistance within pathogenic bacteria. This study could suggest the fact that diverse resistant gene capture arrays have been the source of horizontal and vertical transmission of antibiotic resistance and their persistence in pathogens.

Thus the current study can be concluded with following comments:

1. **Contrary to the existing knowledge, these studies have established sulphonamide resistance determinants were also present outside the integron region. Therefore, sulphonamide resistance cannot be predicted as an event of integron mediated gene transfer.**
2. **The study has demonstrated diverse cassette arrays of class I and class II integrons. This implies diverse source of origin and acquisition. This further underscores the necessities to trace the source of these integrons in order to present their expansion in hospital and community settings.**
3. **Although different variants of *dfr* could be seen, trimethoprim resistance determinants were invariably present in 5´-CS region of all integron gene cassettes. Therefore, individual trimethoprim resistance can be considered as screening marker for integron mediated resistance.**

The routine diagnostic laboratories may incorporate this antibiotic in susceptibility testing for early prediction of presence of integron thereby helping to initiate proper antimicrobial therapy by clinicians.