6.1 SUMMARY AND CONCLUSION

Antimicrobial resistance poses one of the most significant public health threats of the 21st Century. The rational practice of a variety of antibiotics has a great importance in the prevention the occurrence of resistance and also to enable effective utilization of resources and bring down the cost of medical care. This research work was carried out in a tertiary level hospital and analyzed a total of 845 cases of inpatients. Among that, 421 patients were included in the pre interventional period and 424 patients
were registered in the post interventional phase. The objectives of the research were to provide a complete evaluation and optimization of antibiotic use and also to investigate the problems associated with the antibiotic therapy. Individual patient care and antibiotic treatment audits were qualitatively accomplished and consequent implementation of stewardship methods for antibiotic increased the rational use of antibiotics. As the implemented interventions have a positive reflection of impact on balanced use of antibiotics, it is recommended based on the research that, every health care center must ripen an organized system, policies and practices to monitor and standardize the administration and use of drugs focusing on antibiotics. The hospital antibiotic formulary that was prepared during the study was based on the National guidelines for antimicrobial use, British national formulary, and this published formulary that helped to constrain the usage antibiotic in the selected organization. The in-depth study on prescribing patterns, helped to observe and evaluate the authority of each drug orders. With the help of current research, suggestions modifications on the prescribing behaviors of the health care providers were accomplished to improve the rational use of antimicrobials. This in turn provided more rational and cost effective management to the patient. The research work found out that, most frequently prescribed class of drug was Cephalosporins, and within that class ceftriaxone was the ultimate common choice. Based on physician’s preferences and experiences, the selection of antibiotics for different infectious conditions may display a discrepancy in every hospital in India. There is a vital need for microbiological investigation before treatment of infections. This study has helped physicians to have better insight about prescription patterns. Wide spread of a particular class of antibiotic may be one of the reason for resistance. With this study it is confirmed that cephalosporins are over used and the measures must be taken to trim down the use of it. The study revealed that for antimicrobial use, every physicians following independent practicing guidelines. The deprived acquiescence with national guidelines for antimicrobial practice may be raised because of this reason. Another recommendation put forwarded by the study was that, preparing and updating an exclusive antibiotic formulary in the medical care hospitals followed by its active dissemination in the departments where antimicrobial agents are practiced in a larger quantity, may help to improve rational use and also to mend the adherence with the standard guidelines. Adverse drug reactions, drug interactions and
medication errors are the important drug use associated issues in the hospital and a challenge for ensuring the drug safety. The implementation of educational material regarding the antibiotic use reduced these issues and ensured the patient safety. The concept of antibiotic formulary will help the physicians to select the appropriate choice in a minimum time. Most hospital have drug formulary along with it, if they are maintaining a formulary only for antibiotic, it will be highly useful. Electronic form development may help to retrieve information in a faster way there by safe prescription.

While considering the enormous implication of resistance with in antibiotics, it is indispensable that we should act in haste, so that our drugs turn out to be effectual. Imminent systems at hospitals should promise inordinate incorporation and analysis of data, facilitated information delivery to the practicing clinician, and provision of rapid and expert decision support. This will result in optimizing patient outcome while minimizing resistance of antimicrobials.

6.2 RECOMMENDATIONS

The latest drug of choice specific to the micro-organisms on the basis of culture and sensitivity pattern pertaining to a particular diagnosis should be used in the modern hospital setup. The promotion of the appropriate use of sensitivity pattern will help to select the specific agents against the specific organism so that cure to the patients can achieve in optimum period. In each health settings managerial and operational interventions should be applied so that the physician will have a tendency to follow this pattern and thereby reducing the problem of resistance. If the medical science can adapt a method to speed up the culture procedure it will be highly useful in this. Sensitize the undergraduate and post graduate students with the concepts of antibiotic conservation methods. Many fresh graduates are unaware about the need of conservation of anmicrobial agents and they blindly select an antibiotic as they were practiced during their course practice and may be this leads to irrational prescription. So continuing education is important in hospitals. Continuing medical education programme for healthcare professionals should be conducted in the hospital. The authority should provide all the facilities to health professionals to attend such events. The people will have up to date knowledge and there will be a positive change in the prescription pattern as the knowledge sharing happens with continuing education.
Weekly bulletins should be circulated to all wards regarding the available antibiotics in the store. This will help them to select the cost effective antibiotic. It also enhances the practice of selection of available medicines with in the hospital premise.

Periodic audit should be undertaken to examine the appropriateness of antibiotic use. The audit or evaluation may be done in department wise or ward wise or individual doctors prescription wise. There must be appreciation and allowances to the doctors who are adhering with the guidelines. This will also help the rational prescription. The problems associated with prescription can be quantified with these random audits.

The antibiotic formulary should be updated yearly. Every year drugs which are cost effective and available to the common condition must be added to formulary and ineffective drugs should be deleted from it. The pharmacy and therapeutic committee of the hospital can take decision on this with the help of clinical pharmacist.

Clinical meetings must be performed routinely in all the hospital, participating the pharmacists, physicians, nurses and microbiologist need to be conducted on a regular basis to continuously evaluate the use of antibiotics and other drugs as well. All the antibiotic related adverse events, medication errors and interactions must be monitored using ideal system and should be reported the quality control division of hospital. These reports can be circulated with in the hospital so that everyone will be aware about the problems and they will take part to initiate adequate measures to prevent further repetition of the same event. A separate department of quality control in association with clinical pharmacist can handle this issue.

An ideal infection control department can be framed and they can implement all the measures to control the spread of nosocomial infections in admitted patients there by to reduce further exposure to antibiotics.

If individual hospital is having their own hospital antibiotic policy, all associated members can follow this to prevent irrational use. A hospital microbiologist can initiate preparation of antibiotic policy with available culture and sensitive pattern data with in the hospital records.

**6.3 FUTURE SCOPE**

The study about management of adverse drug reactions, medication errors and drug interactions related to antibiotics can be continued.
An electronic reporting system of adverse drug reaction, medication error and drug interactions can be developed. A system that will pass a warning from integrated commercial data base to the hospital information system can be generated. This will help to prevent the current issues to an extent. The impact of Intra Venous to oral formulation switch on occurrence of Intra Venous device interrelated bacterial infections and the proportion of deterioration can be studied further.

6.4 LIMITATIONS OF RESEARCH WORK
The important limitation this study includes its short observation period. The study did not take into account the outpatients. It was a single center study; advances to other institutions require further exploration. The study might be more powerful if other departments were included in this. Out of many stewardship methods only two methods are being used in this study.