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EVALUATION OF ANTIBIOTIC STEWARDSHIP PROGRAM AT INTENSIVE CARE UNIT OF A TERTIARY CARE HOSPITAL

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ABSTRACT

INTRODUCTION

Intensive care units are a pertinent focus of Antibiotic stewardship program because a large proportion of any hospital's use of parenteral antibiotic occurs in ICU.[1] An ideal antibiotic stewardship should not only focus on reduction of antibiotic usage or compliance with guidelines, instead it should enhance care for individual patients by individualizing their choice of antibiotic by performing culture and sensitivity tests.[2] Also an effective antibiotic stewardship program helps to slow the emergence of antibiotic resistance by choosing appropriate antibiotic and thereby improving patient quality of life.

Spread of Antibiotic Resistance

- Non selective use of antibiotics in animals and medical practice.
- Antibiotic administration is delayed in critically ill patients.
- Use of broad spectrum antibiotics too generously or when narrow spectrum antibiotics are used incorrectly.[3]
- When the dose of antibiotics are lower or higher than appropriate for the specific patient.
- Inappropriate duration of antibiotic treatment either too short or too long.
- When antibiotics are prescribed not according to the culture sensitivity report.

Antibiotic stewardship is a programme that refers to co-ordinated intervention designed to improve and measure the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial therapy and route of administration.[4]

Need of Antibiotic Stewardship

Antibiotic stewardship program is an inter-professional effort across the continuum of care.

- It depends on timely and optional selection of dose and duration of an antibiotic
- For best clinical outcome of the treatment
- For the prevention of infection with minimum toxicity to the patient and other adverse effects due to the antibiotic usage.[5]

AIM OF ASP

1. To optimize the use of antibiotics; promote rational and optimal antimicrobial therapy.
2. To promote behaviour changes in antibiotic prescribing and dispensing practices.
3. To improve quality of care and patient outcome.[6]
4. To save on unnecessarily health care costs.
5. To reduce further emergence, selection and spread of antimicrobial resistance.[7]
6. To prolong the life span of existing antibiotics.
7. To build the best practice capacity of heath care professionals regarding the rational use of antibiotics
8. To limit the adverse economic impact of AMR.[8]

OBJECTIVES

- To monitor antibiotic usage.
- To measure appropriateness of antibiotics used.
- To reduce antibiotic resistance.
- As a tool for effective communication.

METHODOLOGY

Study Period: The study was carried out for a period of 6 month from Aug - 1 to Feb -1.
Study Design: concurrent observational & interventional only
Sample Size: 53
Study Tool: Standardized audit tool combined with educational interventional strategy.
Audit Area: The study was conducted at ICU patients in a tertiary care hospital in Kerala.

RESULT AND DISCUSSION

AGE WISE DISTRIBUTION

Age	Number	Percentage
0-20	2	3.44%
20-40	1	1.88%
40-60	16	30.18%
60-80	30	56.60%
>80	4	7.55%

Table No- 1

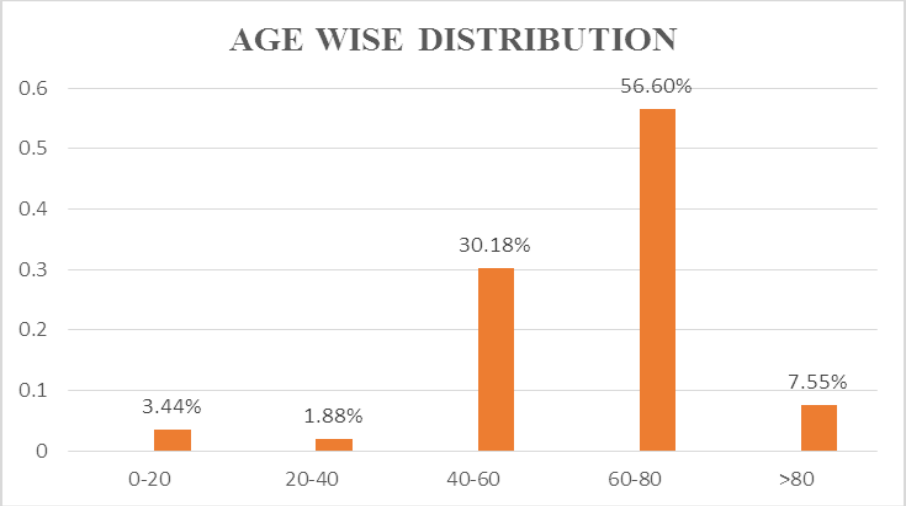

FIGURE- 1

3.44% (2) of the patients were found to be in 0-20 age group, 1.88% (1) were found to be in 20-40 age group, 30.18% (16) of the patients were found to be in 40-60 age group, 56.60% (30) was found to be in 60-80 age group and 7.55%(4) patients were found to be in >80 years of age.

GENDER WISE DISTRIBUTION

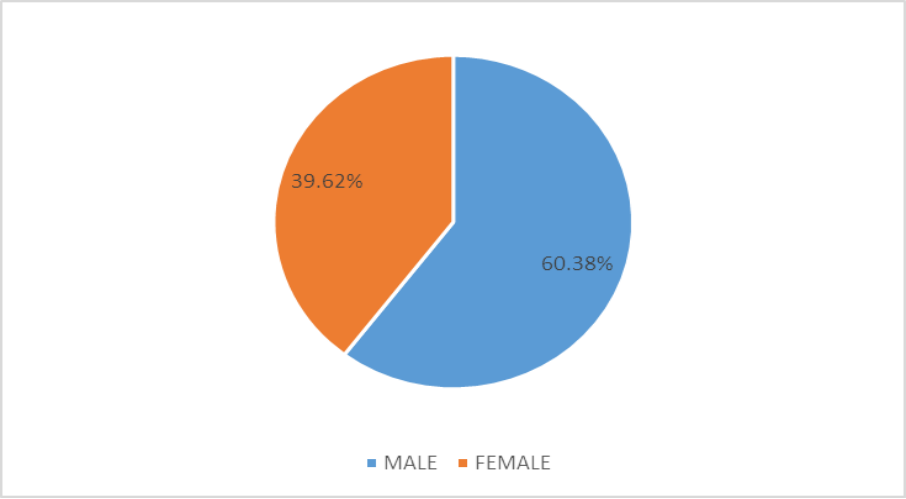

FIGURE -2

Out of 53 subjects, 60.38% (32) of the total subjects were males and 39.62% (21) were females.

DISTRIBUTION BASED ON DIAGNOSIS

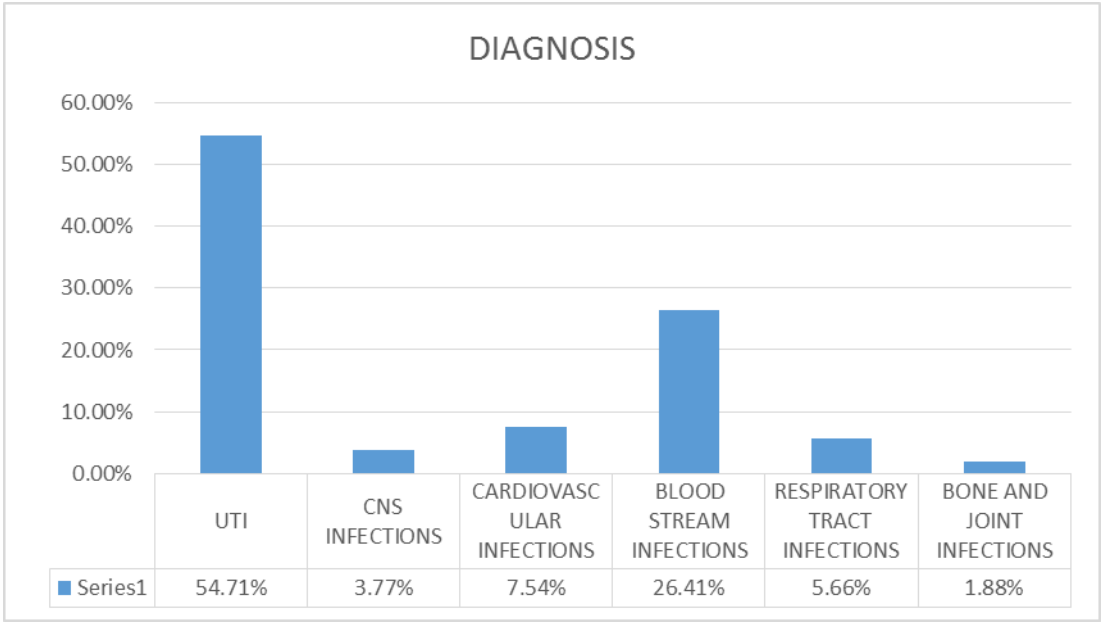

FIGURE – 3

Based on diagnosis in our study 19 patients out of 53 subjects were diagnosed with urinary tract infections and 14 patients with blood stream infections, 4 accounts for cardiovascular infections and the rest diagnosed with respiratory tract infection, CNS infections and bone and joint infections at 3,2 and 1 respectively.

DISTRIBUTION BASED ON ANTIBIOTIC USAGE

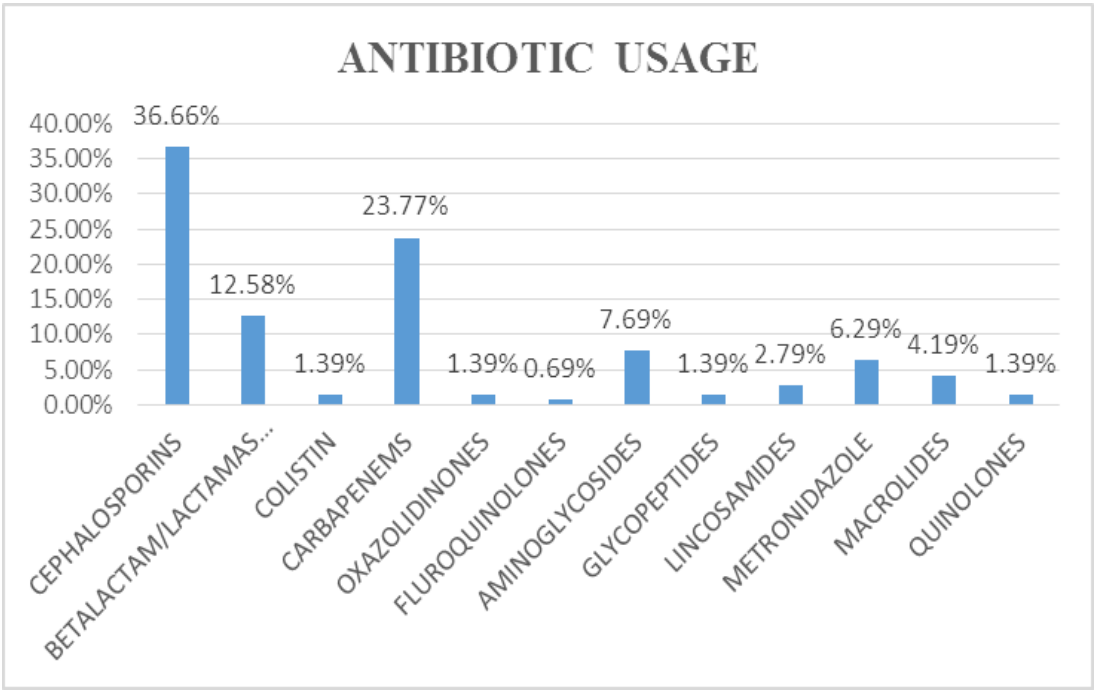

FIGURE - 4

A total of 143 antibiotics were prescribed in 53 patient studied. Cephalosporins (52) were the class of antibiotics widely used during the study period and the least prescribed antibiotics were fluroquinolones (1).

ACTION TAKEN AFTER 48 HOURS

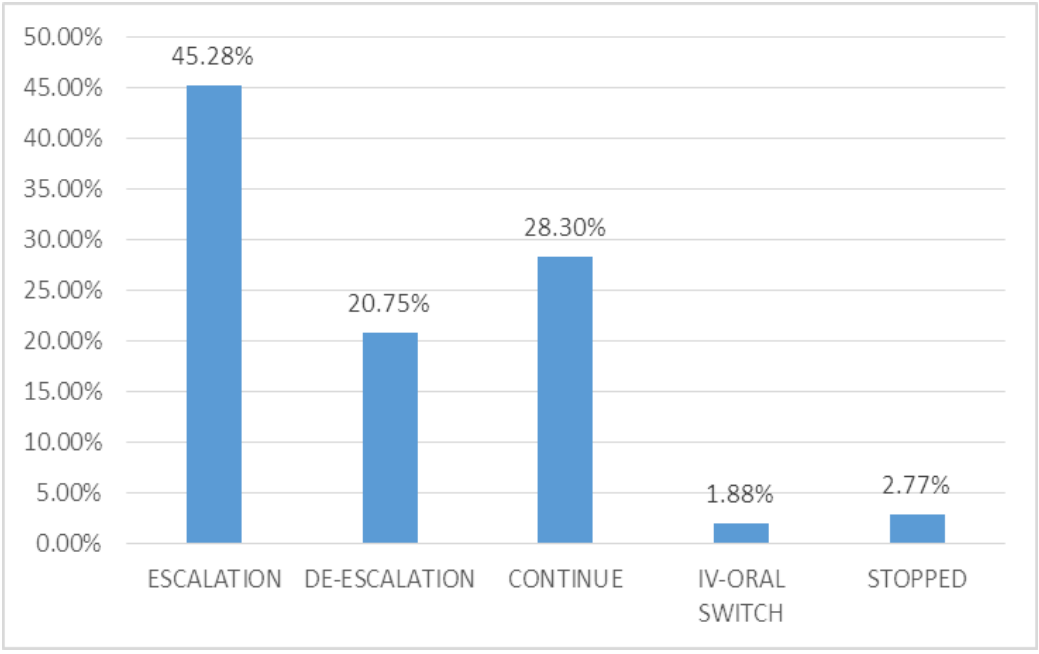

FIGURE – 5

In our study all the patients were reviewed after 48 hours in correspondence with culture sensitivity report. The antibiotic therapy were either escalated (45.28%), de-escalated (20.75%), continued (28.30%), switched to IV-oral (1.88%), or stopped (2.77%) according to microbiological results and their clinical response.

DISTRIBUTION BASED ON ORGANISM ISOLATED

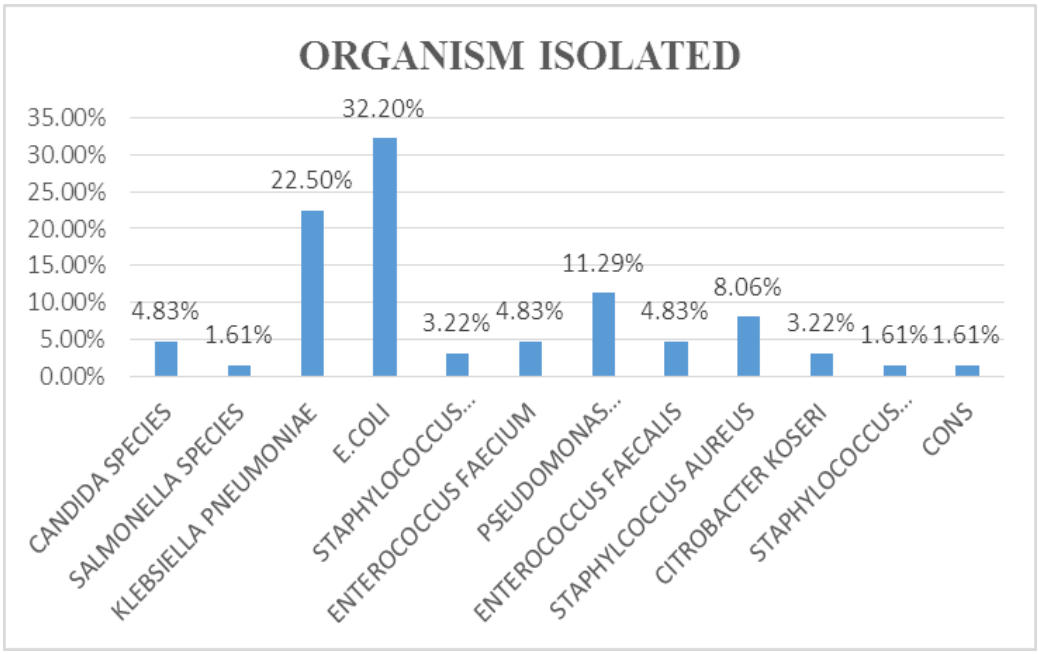

FIGURE – 7

Upon classifying based on microorganisms, *E.coli*(32.20%) was found to be the most commonly isolated organism in icu patients followed by *Klebsiella pneumonia* (22.50%), *Pseudomonas aeruginosa* (11.29%), *staphylococcus aureus* (8.06%), *enterococcus species*(4.83%), *citrobacter koseri* (3.22%), *staphylococcus faecalis* (3.22%) and *staphylococcus epidermis* (1.61%).

As per WHO Guidelines for Antibiotic Stewardship Program, we evaluated the indicators of antimicrobial usage in our study and the findings are mentioned below:-

- Percentage of empirical antibiotics reviewed in 48 hours: 100%
- Percentage of IV- oral switch guideline: 1.88%
- Non- formulary antimicrobial prescription: 0%

- Usage more than one antibiotic: 71.69%
- Percentage of unjustified combination of antibiotics: 1.88%
- Percentage of adherence to antibiotic policy: 83.01%
- Restricted antibiotic started empirically : 24.52%
- Disagreement between culture report and definitive therapy: 24.33%
- Rate of IV antibiotic more than 7 days: 13.28%
- Inappropriateness in dose, dose interval, ROA, duration of treatment: 8.22%

CONCLUSION

The findings of this study improves the quality of antibiotic prescription in clinical practice and contributes a reduction in antibiotic resistance. Thus it's necessary to conduct periodic audits to check rationality and appropriateness of antibiotics. To recapitulate antibiotic stewardship program has a potential to drop initial antibiotic prescription rates, antibiotic treatment duration, and ICU length of stay.

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