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USAGE OF ANTIMICROBIALS IN POST-OPERATIVE PATIENTS IN A TERTIARY CARE TEACHING RURAL HOSPITAL IN INDIA

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ABSTRACT

Background: Rational antibiotic usage reduces the incidence of Post surgical wound infection but its improper usage can further lead to excessive surgical wound infection and increased drug resistance which further complicates the problem. Proper treatment of post-operative and other hospital acquired infections is essential. Hence to investigate the current scenario in surgical post-operative patients, the present study was undertaken. **Objectives:** The objective of this study was to assess the current trends of prescribing antibiotics amongst the patients of surgical postoperative unit of UP Rural Institute of Medical sciences and Research, India. **Materials and Methods:** A descriptive retrospective study was done amongst the patients admitted in the surgical postoperative ward of UP RIMS & R, Saifai, Etawah, India. This study was done by collecting the prescriptions during the months between January 2015 to March 2015. The study was conducted in accordance with the ethical principles of the ethics committee guidelines. We collected data from 142 postoperative patients. Information was collected with respect to Demographic profile, most common case diagnosed, commonly prescribed antibiotics and WHO core indicators were assessed from the inpatients records. Data were analyzed using Microsoft Office Excel 2007 and values were presented descriptively in percentiles. **Results:** We analyzed the data using the various drug use indicators given by the WHO. The average number of drugs per encounter was 4.98. The most common surgeries in the postsurgical unit

were hydrococle 41 followed by Gynecological 32. Most of the patients were in the age group of 31-40 yrs. Most commonly prescribed antibiotic were cephalosporin's (35%) followed by Amminoglycosides (24%). Out of 1250 drugs prescribed, 851(68%) drugs were prescribed by generic names and drugs prescribed by their brand names were 399(32%). Drugs on WHO EML were 61% while that of NLEM 2011 were 74%. Dosage forms used as injectables 91.28% (1141/1250). Fixed dose combinations were prescribed in 36.88% (461/1250) prescriptions. Average cost per prescription was 866.40 INR. **Conclusion:** The present study provides valuable insight about the overall pattern of drug used in postoperative patients in a tertiary care hospital. It is intended to be a step in broader evaluation of safety and efficacy of drug as well as for improving prescribing habits among the fraternity and minimizing incidence of resistance to antimicrobials in surgical wards of a teaching hospital.

KEYWORDS: Antimicrobials, post-operative, surgical ward.

INTRODUCTION

WHO defines drug utilization as "The marketing, distribution, prescription and use of drug in a society with special emphasis on resulting medical, social and economic results".[1] Surgical site infection (SSI) is the most common complication in post operative patients and represents a significant burden in terms of patient morbidity and mortality as well as cost to health services around the world. Among an estimated 27 million surgical procedures, surgical site infections are reported up to 500,000 cases each year.[2] Surgical site infections are associated with increased antibiotic usage and costs, prolonged hospitalization, readmissions, permanent disability or even death of the patient.[3] Although adequate antibiotic prophylaxis can reduce the risk of surgical site infections to some extent, but furthermore this favors the emergence of antimicrobial resistance. About 30-50% of antibiotic use in hospitals is for surgical prophylaxis; however 30-90% of this prophylaxis is not appropriate.[4] There are many major challenges associated with correct SAP like type of procedure, the antibiotic prescribed, dosage and duration of the treatment which further complicates the problem. The discovery of antibiotics was a remarkable achievement of the twentieth century, before which patients who was in contact with common infectious diseases had significant morbidity and mortality. The discovery of penicillin in 1927, followed by the discovery of other antibiotics decreased the mortality rate in a significant way from infectious disease.[5]

Rational use of drugs has been described by WHO(1985) as "Patients who receives medication according to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community''. Noncompliance with rational use is called as irrational use of drug therapy.[6, 7] Irrational prescription of drug is becoming very common in clinical practice due to lack of knowledge about drugs as well as from unethical drug promotion.[8] Irrational use of drugs can lead to misuse, underuse or overuse of medicines.[6] Hence EML (essential medicine list) was formulated to promote rational prescribing. In India, research on the rational use of antibiotics in post operative patients is still rare which is leading to increased mortality rate, therefore the aim of this study was to evaluate the rational use as well as current scenario of antibiotics usage in post operative patients in a Tertiary care teaching rural hospital.

MATERIALS AND METHOD

A descriptive, retrospective study was done in the surgical post-operative wards of UP RIMS AND R Medical College, Saifai, Etawah between the months January 2015 to March 2015.The study was started after getting approval from Institutional Ethics Committee.

Postoperative patients from all the departments i.e. departments of Surgery, Obstetrics & Gynecology, Orthopedics and ENT whose surgeries were performed for therapeutic purpose were included in this study. Total 251 records from the respective patients were collected. All the prescriptions were examined in detail for collecting the information with respect to the demographic characteristics (age & sex of the patients), most common diagnosis & performed surgery, antimicrobials prescribed and WHO core Indicators were assessed from the inpatients records. Data was analyzed using Microsoft Office Excel 2007 and values were presented descriptively in percentiles.

Inclusion criteria: Patients of all ages and either gender who were admitted and had undergone surgical procedure.

Exclusion criteria: Patients who were unable to communicate, patients on ventilators, seriously ill patients requiring admission in Intensive Care Unit (ICU).

Data Analysis

The generic name of the drugs and the generic contents of formulation were obtained from the Indian Drug Review March –April, 2011.[9]

Data was further analyzed as under

1. Age and sex wise distribution

2/Average number of drugs per encounter

4. Percentage of an antibiotic prescribed

5. Percentage of encounters with an injection prescribed

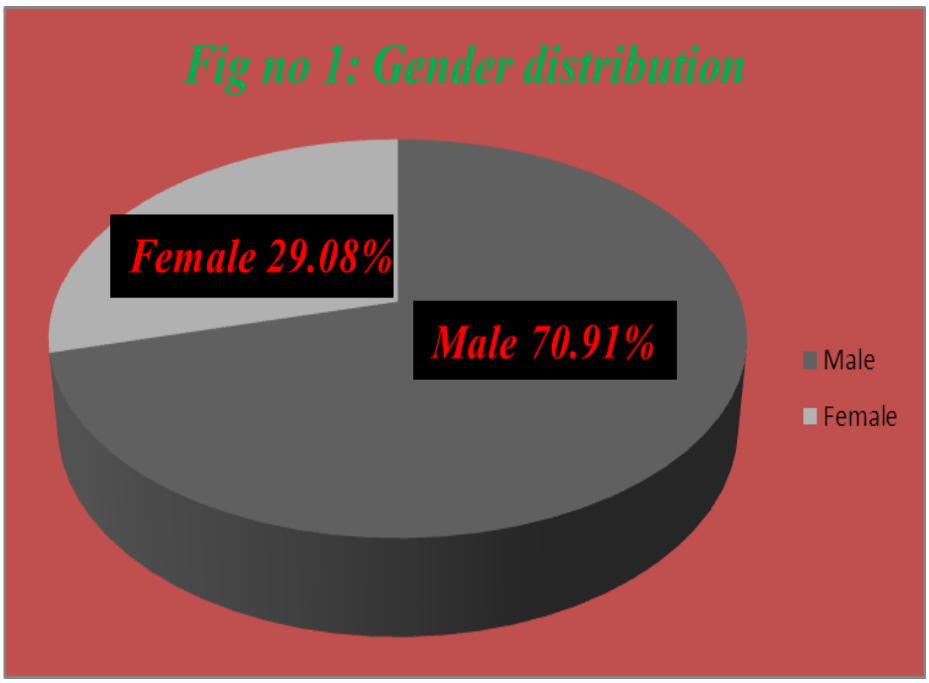
7. Percentage of drugs prescribed by generic name

8. Average drug cost per encounter

9. Percentage of drug prescribed from Essential drug list formulary

RESULTS

A total of 251 (177 male & 77 female) patients who matched the inclusion criteria in surgical post-operative wards were analyzed in the study. The gender distribution of patients is shown in Fig no: 1.



Out of 251 patients, most of the patients were in the age group of 31-40 while the least were in the age group of 71- 80 as shown in Fig no: 2

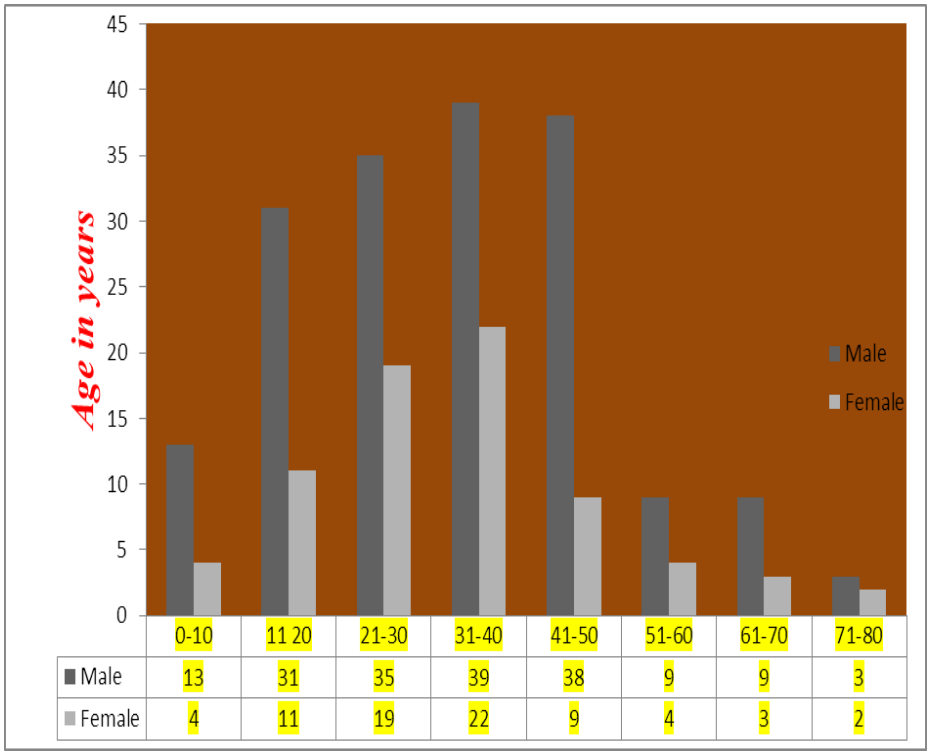


Fig no 2: Age between years

Commonest surgeries in our study were Hydrococle (16.33%) followed by gynecological (12.74%) but the least cases was for thyroid surgeries (1.19%). These surgeries are shown in Fig no: 3.

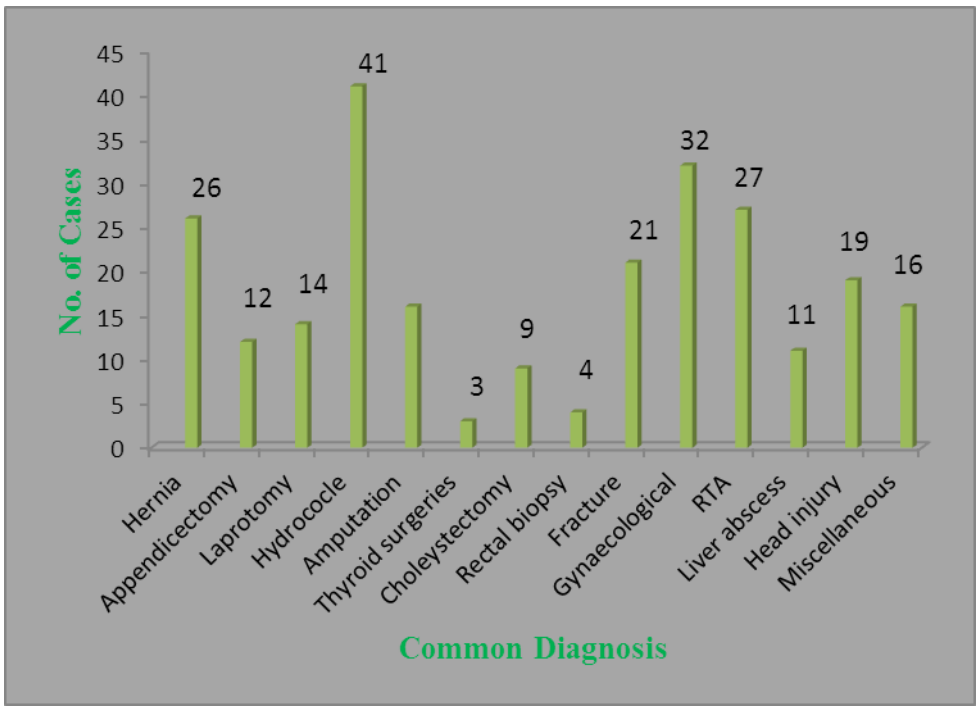


Fig no 3: Common surgeries

A total number of 1250 antibiotics were prescribed in our study. The most frequently prescribed classes of antibiotics were cephalosporin (35%) followed by Amminoglycosides (24%) and penicillin (14%) but least no of antibiotic was amongst Nitroimidazoles group (5%) as shown in Fig no: 4.

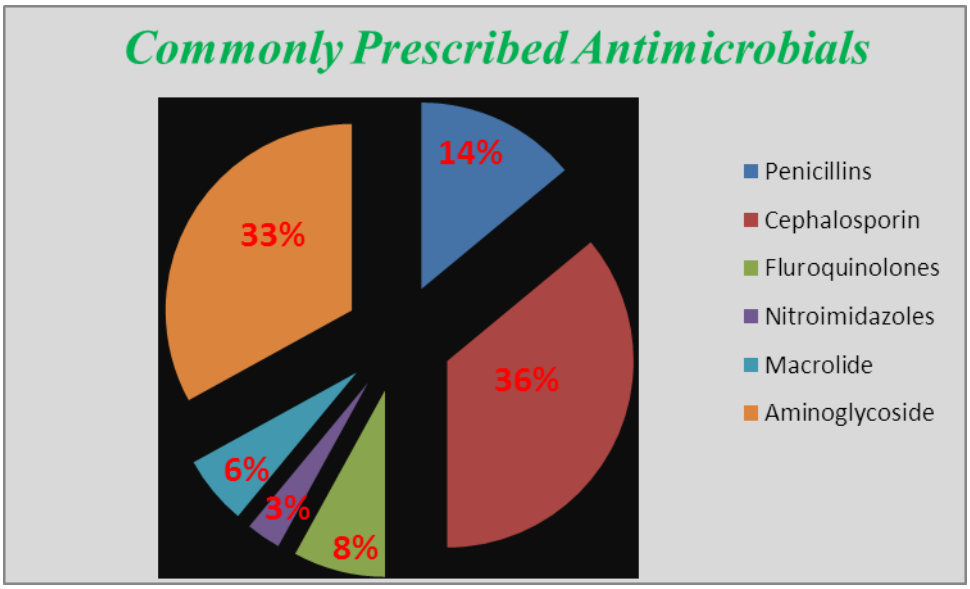


Fig no 4: Antimicrobials prescribed

In overall 251 prescriptions, Most of the prescription contained injectable antibiotics. Thus the percentage of encounters with an injectables prescription was 91.28% in our study. Average number of drugs prescribed per prescription was 4.98.Out of 1250 drugs prescribed, 68% drugs were prescribed by generic names and drugs prescribed by their brand names were 32%.Drugs on WHO EML[10] is 61% while that of NLEM 2011[11] were 74%. Dosage forms used are injectables 49%. Fixed dose combinations were prescribed in 37% prescriptions. Mean duration of hospital stay was 9 days.

In our study although most of the drugs were provided free since it was a government set up, we calculated the cost of the antibiotics prescribed in accordance with market value. We have not calculated the cost of other drugs and materials used. Cost of blood transfusion, any laboratory test incurred postoperatively was also not analyzed.

DISCUSSION

Antimicrobial agents are important category of drugs which are essential in treating or preventing development of infections in patients. Post operative Patients in surgical wards develop infections which are caused by bacteria that are highly virulent. The use of

antibiotics in such patients for treatment of infections is a justifiable practice. However it requires review of the chosen regimen on regular basis for monitoring efficacy, toxicity, cost and other aspects to maximize the benefits to the patient.With the advent of antibiotics and their widespread use, the incidence of wound infection has come down remarkably. The present study is an attempt to monitor the current scenario about the antibiotics, that how they are being used amongst post operative patients.

We collected the data from 251 patients matching inclusion criteria that underwent surgery and were in their postoperative period till they were discharged, in the surgical ward of our hospital. In our study the predominance of male patients was (70%) which was in contradiction with the study done by Ali SA et al in which 58.85% of patients were male who had a study on 720 patients which can be concluded for this difference.[12] In the study done by Khan M L et al also shows percentage of male undergoing surgery was 59.86%, which was slightly more than our data.[13]

In our study majority of patients were of the age group of 31-40 years which supported to a study done by Sapna patil et al 2012 who stated that majority of cases in her study were between the age group of 20-40 years.[14] The reason behind it can be concluded that it is the productive age group that is actively involved in socioeconomic activities, and this might be making them vulnerable to diseases, which may need surgical interventions. In contradiction to this Bhansali N B et al 2013 reported 57.08% of patients from 40-60 age group.[15]

In our study most common surgery was hydrocoele and accounted for a total of 41 patients, which was 16.33%. This finding is higher than the findings of Bhansali NB et al 2013 which accounted for 4.86%.[15] The other common procedure done was surgery of hernia accounting for 10.35% of total patients, which was in accordance with the findings of Khan M L et al 2008 who stated 10.4% of surgery of hernia of all surgeries.

Most commonly prescribed antibiotic was cephalosporins (35%) followed aminoglycosides (24%) and quoinolones (11%) in our study which was consistent with the findings of Sapna patil et al 2012.[14] Similar results were observed in the study done by Salah I Kheder 2011.[16] In a study done in Nepal, combination of antibiotics was most commonly used antibiotic regimen (i.e.ampicillin and cloxacillin) in post operative patients(138 patients).[17]

WHO core indicators[18,19,20], as found in our study are described in the table-1.

SR. NO.	CORE INDICATORS	OUTCOME
1.	Average no. of Antibiotics per prescription	4.98 (1250/251)
2.	Average no. of drugs prescribed by generic name	68% (1250/251)
3.	Average no. of drugs prescribed by brand name	32% (1250/251)
4.	No. of prescriptions having injectables formulation	91% (1250/251)
5.	No. of drugs prescribed as fixed dose combinations	37% (1250/251)
6.	No. of drugs mentioned in WHO EML	61% (1250/251)
7.	No. of drugs mentioned in NLEM 2011	74% (1250/251)

Average drug cost per encounter in a postoperative patient in our study was 866.40 INR which was almost equal to the study done by Bhansali NB et al 2013 stated average drug cost per encounter in a Post operative patient in our study was 1090.40 INR.[15] The cost was calculated according to the minimum price of that drug in Indian Drug Review.[9] Postoperative state commonly requires the need for a very few classes of drugs. The most common amongst them are antimicrobials, analgesics, intravenous fluids, anti-emetics and antacids. All these drugs add a lot to the cost of therapy. In particular the cost of injectables drugs is very high. Direct non medical cost i.e. cost incurred by patient in receiving medical care e.g. transportation to and from hospital and lodging of family members were not taken into account.

The average no. of antibiotics used in our study came out to be 4.98, which was relatively higher than those in other reports.[22, 23] In contradiction to this Abula T, Kedir M found 2.18 in his study.[24] We observed that the mean duration of hospitalization among the study population was 9 days which is almost to previously done Indian study.[25]

CONCLUSION

Over prescription of antibiotics by the clinicians and it's inappropriate use is still a common practice in many hospitals in developing countries. Prescription of antibiotics without evidenced by culture and sensitivity tests is also a major problem, which results in a poor patient compliance. All these practices result in emergence of multiple antibiotic resistant strains of bacteria. Therefore, there is a need for strict antibiotic prescription policies, which should be developed by a collaborative effort involving physicians, surgeons and microbiologists. In conclusion UP RIMS and R being a tertiary care teaching rural hospital has major responsibility to curb irrational drug prescription by the doctors and there is need to follow ethical guidelines on a proper prescription of drugs and to ensure that the patients utilize drugs only on prescription and in right formulations. The present study provides

valuable insight about the overall pattern of drug used in postoperative patients in a tertiary care hospital. It is intended to be a step in broader evaluation of safety and efficacy of drug as well as for improving prescribing habits among the fraternity and minimizing incidence of resistance to antimicrobials in surgical wards of a teaching hospital.

CONFLICTS OF INTEREST: The authors declare that they have no competing interests.

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