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USAGE OF ANTIBIOTICS IN POSTOPERATIVE PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL IN INDIA.

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Abstract: **BACKGROUND / INTRODUCTION**: Drug utilization studies plays a very important role in the society to promote rational use of drug. Rational prescribing should be promoted to prevent drug- drug interaction and hence helps in reducing morbidity of the patients. **OBJECTIVES**: The objective of this study was to assess the pattern of prescribing antibiotics amongst the inpatients of surgical postoperative unit of NIMS medical college and hospital, Jaipur, India. **MATERIALS AND METHODS:** A retrospective study was done amongst the inpatients admitted in the surgical postoperative unit of NIMS medical college and hospital , Jaipur, India over a period of three months from November 2013 to January 2014. The study was conducted after getting approval from the Institutional Ethical Committee. Total 170 records were noted after taking written informed consent from the respective patients. Demographic profile, most common case diagnosed, commonly prescribed antibiotics as per Anatomical Therapeutic Chemical Classification (ATC) and WHO core indicators were assessed from the inpatients records. **RESULTS**: Data from 170 records were analysed. Out of 170 patients, 100 were male patients and 70 were female patients. The most common diagnosis in the postsurgical unit were fractures(28.82%) and then head injury (12.35%). Most of the patients were in the age group of 21- 30 yrs. Most commonly prescribed antibiotic were cephalosporin's (95.29%) and then aminoglycosides (71.17%) . The average number of drugs per prescription was 5.45. Out of 927 drugs prescribed, 18.01% drugs were prescribed by generic names and drugs prescribed by their brand names were 81.98%. Drugs on WHO EML were 52.96% while that of NLEM 2011 were 68.93%. Dosage forms used as injectables 86.08% (798/927). Fixed dose combinations were prescribed in 25.78% (239/927) prescriptions. Average cost per prescription was 997.00 INR.

Keywords: Drug utilization studies, surgery, rational use of drugs, ATC code.

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INTRODUCTION

Drug utilization research was defined by WHO in 1977 as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting in medical and socioeconomic consequences. Drug utilization studies are the actual powerful exploratory tools to ascertain the role of drugs in the society. [1][2][3] It aims to analyse the present state and the development of drug usage at various levels of the healthcare systems whether national, local or institutional. [1]

Rational use of drugs has been described by WHO as "Patients receive 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" (WHO,1985). Non-compliance with rational use is called as irrational use of drug therapy. [4][5] Irrational prescription of drug has become very common in clinical practice due to lack of knowledge about drugs and also unethical drug promotion.[6] Irrational use of drugs can lead to misuse, underuse or overuse of medicines.[4] Hence EML (essential medicine list) was formulated to promote rational prescribing. There is a dire need of rational drug use, still there is a lack of pioneer drug utilization studies in this field.

The objective of this study was to assess the pattern of antibiotic drug usage among the inpatients of postsurgical unit in a tertiary care teaching hospital in India.

MATERIALS AND METHODS

A retrospective study was done among the inpatients admitted in the postsurgical unit of NIMS medical college and hospital , Jaipur, India over a period of three months from November 2013 to January 2014. The study was conducted after getting approval from the Institutional Ethical Committee. Total 170 records were noted after taking written informed consent from the respective patients. Demographic profile, most common diagnosis, commonly prescribed antibiotic as per Anatomical Therapeutic Chemical Classification (ATC) and WHO core indicators were assessed from the inpatients records.

INCLUSION CRITERIA

Patients of all age groups admitted in the postsurgical ward of NIMS hospital were included.

EXCLUSION CRITERIA

Patients admitted in other wards were excluded from the study

STATISTICAL ANALYSIS

The data was subjected to descriptive analysis using Microsoft Excel. Drugs were classified according to the WHO ATC classification[11] and verified by WHO EML [9] (Essential Medicine List) as well as NLEM [10] (National List of Essential Medicines) 2011. Different parameters were given as percentage.

RESULTS & DISCUSSION:

Data from 170 postsurgical inpatients records were analysed. Out of 170 patients, 100 were male patients and 70 were female patients, as shown in the figure-1.

Fig -1 Shows sex differentiation among patients.
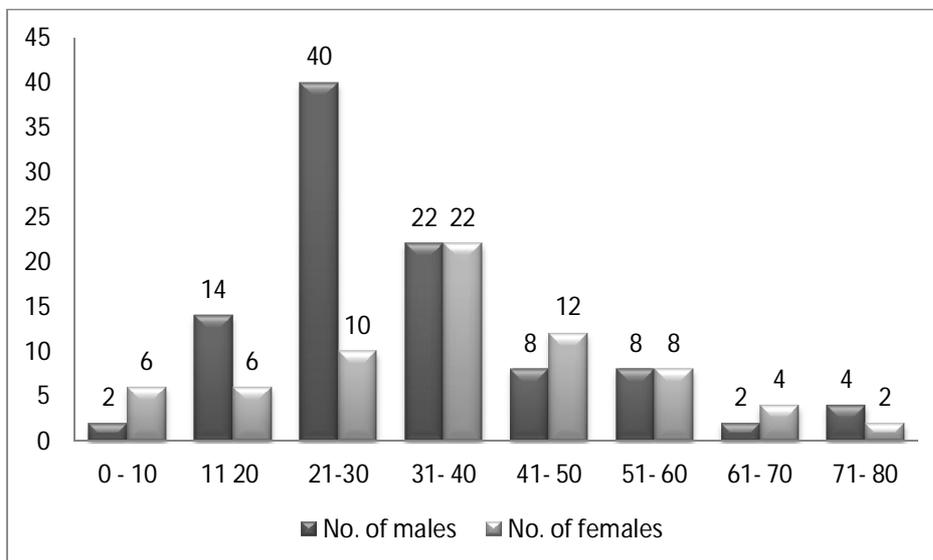
Male preponderance was seen in our study which corresponds with the study done by Bhansali N B et al 2013 [6]. Similar results were reported by Sapna Patil et al 2012.**[7]** Overall most of the patients (n=50) were of the age group 21-30, out of which 40 were males and 10 were females. While most common age group among males was 21-30(n=40) and females was 31-40 (n=22). In a study maximum patients were in the age group 20- 40 which is almost similar to our study.[7] In contradiction to this Bhansali N B et al 2013 reported 57.08% of patients from 40- 60 age group.[6]

The most common diagnosis in the postsurgical unit was fracture (n=49) and head injury (n=21) as 2nd commonest diagnosis shown in figure-2.

Fig   -2:   Incidence   of   admitted   cases   in   postsurgical   unit.
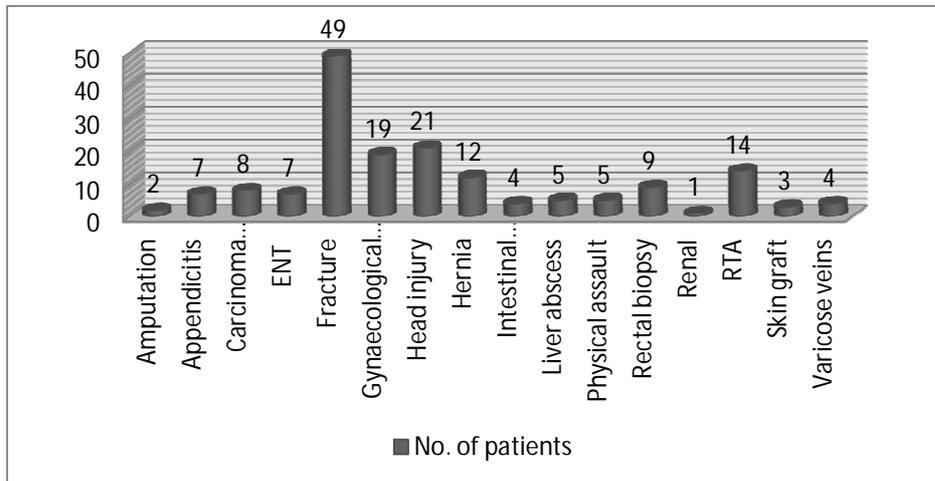
Most commonly prescribed antibiotic was cephalosporins (34%) and then aminoglycosides(26%) and quoinolones (12%).Cephalosporin was the most extensively used antibiotic in some previous studies also.[7][8] While in a study done in Nepal, combination of ampicillin and cloxacillin was the most commonly used antibiotic regimen (138 patients). [12] Surprisingly in a Brazilian study, the most commonly used antibiotics for prophylaxis were first generation cephalosporins[13]

Table-1: Commonly prescribed antibiotics.
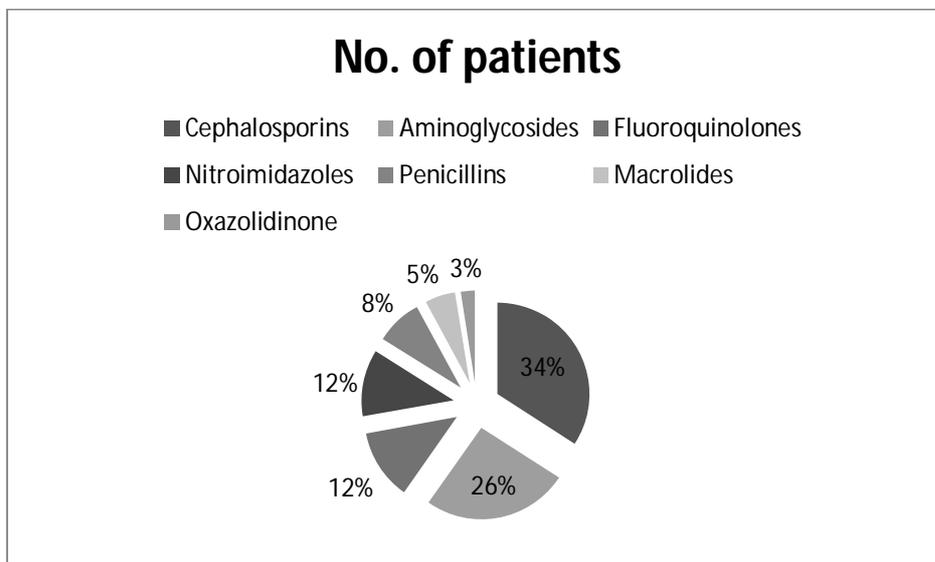
Among cephalosporins (J01DD), Ceftriaxone(J01DD54) was most frequently prescribed which corroborates with study done by Sapna et al 2012 [7] in which ceftriaxone was prescribed to 23.77% of patients. Similar results were reported by Prashanth P et al 2011 in a study done in

postoperative patients in Karnataka.[16] In an Iranian study use of ceftriaxone as surgical infection prophylaxis has been emphasized in which 266 out of 300 patients were prescribed ceftriaxone.[14] A different scenario was seen in one Canadian study among TURP patients in which antibiotic regimens prescribed were ciprofloxacin (32%), cefazolin (25%) and gentamicin (3%).[15]Cephalosporin has been proved as a very important class of a drug but its use against the suggested protocol can lead to emergence of resistance.[15][16]

In our study Amikacin (J01GB06) was more frequently prescribed aminoglycosidic agent than gentamicin (J01GB03). Ciprofloxacin (J01MA02), Levofloxacin (J01MA1)and Moxifloxacin (J01MA14) were commonly prescribed fluoroquinolones. Other antibiotics prescribed were metronidazole(J01XD01), amoxicillin (J01CA04) , azithromycin (JO1FA10) and linezolid (J01XX08).

WHO core indicators[1][2][3][17]as found in our study are described in the table-1.

Table-1: WHO core indicators as analysed in 170 prescriptions

SR. NO.	CORE INDICATORS	OUTCOME
1	Average no. of drugs per prescription(Antibiotics + other drugs)	5.45 (927/170)
2	Average no. of drugs prescribed by generic name	18.01% (167/927)
3	Average no. of drugs prescribed by brand name	81.98%(760/927)
4	No. of prescriptions having injectable formulation	86.08%(798/927)
5	No. of drugs prescribed as fixed dose combinations	25.78%(239/927)
6	No. of drugs mentioned in WHO EML	52.96%(491/927)
7	No. of drugs mentioned in NLEM 2011	68.93%(639/927)

The average number of drugs per prescription in our study was 5.45 which shows polypharmacy and is greater than study done by Prashanth P et al 2011.[16] But reduction in number of drugs to postoperative patients is inevitable . Even higher number of drugs per prescription were reported in a previously done Indian study.[6]

Out of 927 drugs prescribed, 18.01% drugs were prescribed by generic names and drugs prescribed by their brand names were 81.98%. This shows a decline in prescribing drugs by their generic names. Drugs on WHO EML[9] are 52.96% while that of NLEM 2011 [10] were 68.93%. Dosage forms used are injectable 86.08%(798/927). Complete diagnoses was written in 81% patients Complete information about the patient was written in 67 % patients.More than one diagnosis was present in 41% of prescriptions. 69 % of prescriptions were complete in terms of dose, route, frequency, strength and dosage form. Fixed dose combinations were prescribed in 25.78% (239/927) prescriptions. Average cost per prescription was 997.00 INR which is almost comparable to a study in which average drug cost per encounter in a postoperative patient in our study was 1090.40 INR.[6]

CONCLUSION:

Drug utilization study is a must to rule out irrational prescribing of drugs.This study has given us an overall pattern of rationality of prescribing prescription in the postoperative patients. Our study will help in promoting knowledge about ATC classification and EML list among clinicians. To conclude despite of shortcomings our study can offer a wealth of data on rational use of drug.

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

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REFERENCES:

1. Sharma P, Parakh R, Sharma N. Pattern of prescribing prescriptions among the patients attending the department of respiratory medicine in a tertiary care teaching hospital in North India.Indoamerican journal of pharmaceutical research.2013;3(12):1544-1551

2. Sharma N, Parakh R, Sharma D.A drug utilization study in critically ill patients in a tertiary care teaching hospital in North India. Am J Pharmtech Res 2014;4(1): 780-789.

3. Sharma N, Advani U, Kulshreshtha S. Screening of prescriptions in geriatric population in a tertiary care teaching hospital in North India. The Journal of Phytopharmacology 2013;2(5):38-45.

4. Rational   use   of   drugs   Retrieved   December   5,   2013,   from. archives.who.int/tbs/rational/h3011e.pdf

5. Rational use of drugs. Retrieved December 5, 2013, from www.who.int/medicines/areas/rational_use/en/

6. Bhansali NB, Gosai TR, Dholaria NK. Drug utilization study in post-operative patients in surgical ward of a tertiary hospital attached with medical college. Der Pharmacia Lettre, 2013, 5 (1):251-257

7. Sapna Patil, L. Padma, Veena D.R. Drug utilization study of antimicrobials in post-operative wards in a teaching hospital Int Res J Pharm App Sci. 2012;2(5)- 59.

8. Salah I Kheder. Cephalosporin usage and resistance trends in Sudanese hospital surgical wards. J Pharm Biomed Sci 2011;11(3):1-6.

9. WHO | WHO Model Lists of Essential Medicines . Retrieved December 6, 2013, from http://www.who.int/medicines/publications/essentialmedicines/

10. National List of Essential Medicines - Central Drugs Standard.. Retrieved December 7, 2013, from. cdsco.nic.in/National%20List%20of%20Essential%20Medicine-%20final%20copy.pdf

11. WHOCC - ATC/DDD Index. Retrieved December 5, 2013, from www.whocc.no/atc_ddd_index

12. Bishnu R G, Hom P P, P Ravi S. Surgical site infection and Antibiotics use pattern in a tertiary care hospital in Nepal J Pak Med Asso. 2008;58(3):148-151.

13. Laura Guimarães Fonseca; Lucieni de Oliveira Conterno.Audit of antibiotic use in a Brazilian University Hospital. Braz J Infect Dis 2008;8 (4):272-280.

14. Shohrati M, Hosseini S. M. J, Rahimian S. Assessment of reasonable use of Ceftriaxone in internal and surgical wards. Kowsar Medical Journal Fall 2010, Volume 15, Issue 3; 171-176.

15. Keith A. Lawson, Jan K. Rudzinski, Ingrid Vicas. Assessment of antibiotic prophylaxis prescribing patterns for TURP: A need for Canadian guidelines? Canadian Urological Association 2013;7(7-8): E530-536.

16. Prashanth P, Narendranath S, Geetha M. Trends in prescribing antimicrobials in post-operative wards in a tertiary care hospital. Drug Invention Today 2011, 3(12), 301-304.

17. P. Sharma, N Sharma , R. Parakh. Screening of prescriptions in patients of type-2 diabetes mellitus in a tertiary care teaching hospital. Inter J Pharm Res Biosci 2014 ;3(1): 401-409.