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RESEARCH ARTICLE

ASSESSMENT OF ANTIBIOTIC USAGE IN SURGERY DEPARTMENT OF A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Objective: To study the antibiotic prescribing pattern in surgery department of a tertiary care teaching hospital. **Methods:** A prospective observational study was conducted over a period of six months in a tertiary care teaching hospital. A total of 300 case records of inpatient undergone treatment in surgery department was reviewed. The relevant information was recorded in structured proforma and data was evaluated. **Results:** Case records of 300 patients who have undergone surgery were observed during the study period. Antibiotics were recommended for 254 patients. The most preferred route of administration were parenteral (95.27%) than oral route (3.94%) followed by both (0.79%). Cefotaxim was mostly prescribed (23.33%) followed by sulbactam (18.24%) and metronidazole (17.55%). Majority of prescriptions were prescribed with 2 antibiotics (53.15%) and single antibiotic was prescribed in 39.37% cases. Among the 154 antibiotic combination prescribed, out of which cefaperazone + sulbactam (39.61%) was the most commonly prescribed regimen followed by ciprofloxacin + metronidazole (8.87%) and Cefotaxime + metronidazole 27 (17.53%). The first dose of antibiotic was administered more than 2 hour before operation in 143 (56.30%) cases. **Conclusion:** We have evaluated the prescribing pattern of antibiotics in Surgery department. Almost prescribing patterns were found to be rational, as we can see adherence to American Society of Health-System Pharmacists (ASHP) guidelines in many of the cases. The results of this practice can help to provide evidence for recommendations that may help to improve health care.

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INTRODUCTION

Antibiotics are frequently used in surgical patients as approximately 30% of patients undergoing surgery will develop post-operative infections (Lim, 2015). There is evidence that appropriate use of antibiotic in surgery is effective in decreasing mortality and health care costs associated with infections developed after surgery. The benefits of antibiotic prophylaxis need to be balanced against the risks of allergic reactions, toxicity, side effects and the increasing problem of antimicrobial resistance (Radji et al., 2014; Palmer et al., 2000). Antibiotics are one of the pillars of modern medical care and play major role both in the prophylaxis and treatment of infectious diseases. The issues of their availability, selection, and proper use are of critical importance to the global community (Abula, 2004). The prophylactic use of antimicrobial agents has become an important component of the standard of caution in practically all surgical procedures when good and proper principles of prophylaxis are applied. The efficacy of antimicrobial prophylaxis has been studied for decades. However, despite this approved proof of antimicrobial prophylaxis efficacy,

publications of guidelines for antimicrobial prophylaxis is often sub-optimal. Some data recommend that approximately 30-50% of antibiotics used in hospitals are prescribed for surgical prophylaxis and 30-90% prescriptions are unsuitable. Beside this data, many other studies indicate that inappropriate administering of prophylactic antibiotics (wrong antibiotic selection, wrong timing and excess duration of administration) affects prophylaxis procedure (Saleh, 2013). Appropriate surgical antibiotic prophylaxis (SAP) can reduce the postoperative wound infection. Inappropriate use increases the selective pressure and favours the development of antimicrobial resistance. Around 30-50% of antibiotics use in hospitals is for SAP and between 30-90% of this prophylaxis is inappropriate. The antibiotic is either given at the wrong time or continued for a long period (Giri, 2008). Appropriate selection of antibiotics depends on the knowledge of pathogens most likely to be associated with a given surgical procedure. The appropriate choice of antimicrobial agents, dosage regimen, timing, duration, and route of administration must be evidence based. Inappropriate use of antibiotic prophylaxis, for example, over-consumption or inappropriate timing, have been shown to increase the risk of adverse drug reactions, hospital

costs, emergence of resistant strains of microorganisms, and super-infections. Several studies have reported overuse and/or misuse of preoperative antibiotics in various countries (Al-Azzam *et al.*, 2012). Development of guidelines for the use of prophylactic antibiotics based on local microbial resistance patterns can improve the effectiveness of the use of prophylactic antibiotics. Surgeons often use a broad-spectrum antibiotic prophylaxis prior to surgery or that does not comply with the guidelines that have been recommended (Radji *et al.*, 2014). Even though the literatures reports a number of studies on antibiotic usage in surgical prophylaxis, there were limited studies conducted in south India. Hence the present study was conducted to explore the adherence of antibiotic usage in surgical prophylaxis according to ASHP guidelines.

MATERIALS AND METHODS

A Prospective observational study was carried out for 300 patients in the surgery department of Navodaya Medical College Hospital & Research Centre, Raichur. Data were collected on a pretested case record form which included information on patient characteristics, surgical department under which admitted, type of operation, antimicrobial agents prescribed as well as their route of administration and timing of administration prior to surgery. Follow up data included additionally administered doses of antimicrobial agents. The study was approved by Institutional Ethical Committee of the hospital and by using the ethical clearance certificate.

Patients who were admitted and not undergone surgery and those who were taking antibiotics to treat infections, also surgery in infants, cancer patients were excluded from the study. All data collected were analysed. Appropriateness of preoperative antibiotic prophylaxis was assessed as per guidelines of ASHP. This guidelines provide evidence based recommendations to the practitioners for rational use of prophylactic antimicrobials. Descriptive statistics was used to summarize the demographic characteristics, surgical information and antibiotic usage data. Frequencies and proportions / percentages were used to describe variables.

RESULTS

In the study population of 300 patients, 155 (51.67%) were female and 145 (48.33%) were male patients who underwent surgery and majority of patients enrolled are between 30- 39 (22.67%) years of age. Among 300 patients, antibiotics was recommended in 254 (84.67%) patients and in the remaining 46 (15.33%) prescriptions it was not recommended as shown in Figure 1. Antibiotics were mostly administered by parenteral route 242 (95.27%) than oral route 10 (3.94%) followed by both (0.79%) as given in Figure 2. Out of 254 prescriptions 135 (53.15%) were prescribed with two antibiotics and 100 (39.37%) with single antibiotic as given in Table 1. Among 433 patients with antibiotics prescribed, cefotaxim 101 (23.33%) was mostly preferred followed by sulbactam 79 (18.24%), metronidazole 76 (17.55%) as shown in Figure 3.

Table 1. Number of antibiotic prescribed per prescription (N= 254)

S. No.	No. of antibiotics	Frequency	Percentage (%)
1.	One	100	39.37
2.	Two	135	53.15
3.	Three	14	5.51
4.	Four	04	1.58
5.	Five	01	0.39

Table 2. Category of Antibiotics Prescribed (N=433)

S. No.	Category	Frequency	Percentage (%)
1.	Cephalosporin	184	62.8
2.	Beta lactamase inhibitor	82	27.99
3.	Nitroimidazole	72	24.57
4.	Flouroquinilone	65	22.18
5.	Aminoglycoside	06	2.05
6.	Penicillin	03	1.02
7.	Sulfonamide	01	0.34
8.	Dihydrofolate reductase inhibitor	01	0.34

Table 3. Antibiotic combinations given (N=154)

S. No.	Antibiotic	Prophylaxis	Percentage (%)
1.	Cefope + Met	58	19.8
2.	Cipro + Met	26	8.87
3.	Cefota + Met	25	8.53
4.	Cefota + Cipro	04	1.37
5.	Ceftri + Sulb	04	1.37
6.	Ceftri + Met	03	1.02
7.	Pipe + Tazo	02	0.68
8.	Pipe + Met	02	0.68
9.	Cefopera + Sul + Met	06	2.05
10.	Cipro + Met + Cefota	02	0.68
11.	Cefota + Met + Ceftri + Sul	01	0.34
12.	Cifope + Met + Pipe + Sul + Amika	01	0.34
13.	Misellaneous	13	4.44

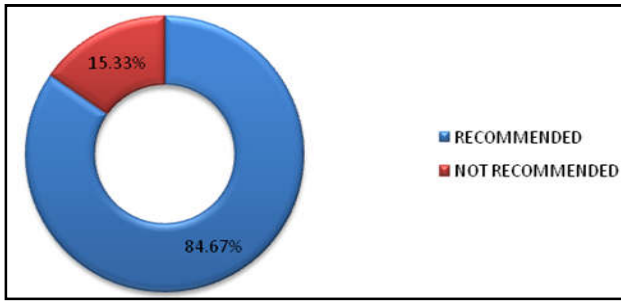


Figure 1. Prescribing Pattern of antibiotics (N = 300)

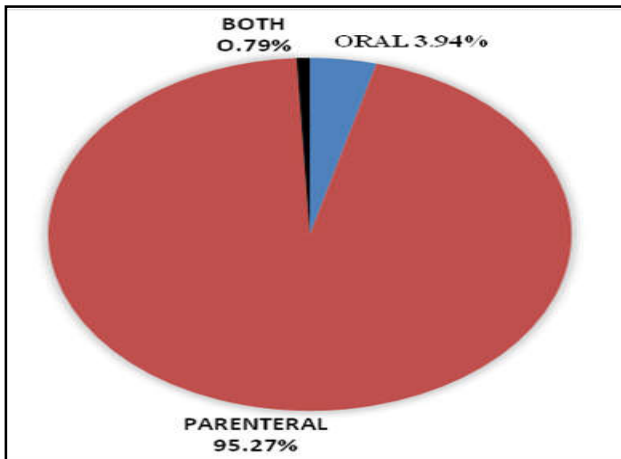


Figure 2. Route of administration of antibiotics (N=254)

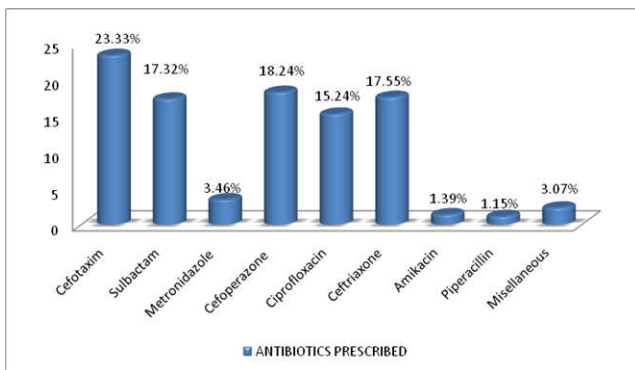


Figure 3. Antibiotics prescribed (N= 433)

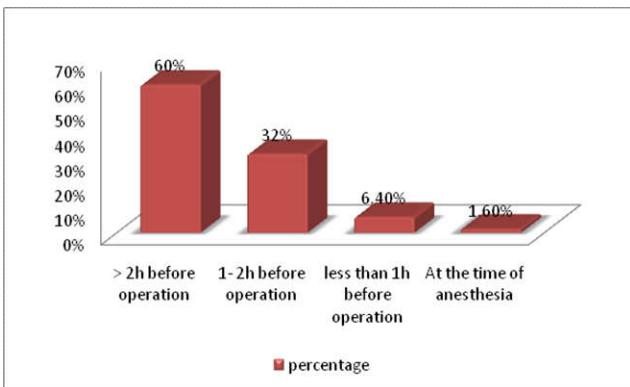


Figure 4. Timing of antibiotic dosage

Cephalosporins 192 (44.34%) were the mostly preferred antibiotic followed by beta lactamase inhibitor 82 (18.94%), nitroimidazole 76 (17.55%) and fluroquinolone 67 (15.47%) as given in Table 2.

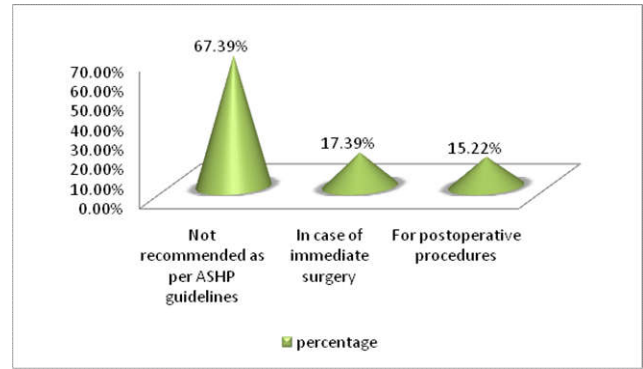


Figure 5. Reasons for not recommending antibiotics (N=46)

In the study among the 154 antibiotic combination prescribed, out of which cefaperazone + sulbactam 61 (39.61%) was the most commonly prescribed regimen followed by ciprofloxacin + metronidazole 26 (8.87%) and Cefotaxime + metronidazole 27 (17.53%) as given in Table 3. Among 254 cases, first dose of antibiotic was administered more than 2 hour before operation in 143 (56.30%) cases as shown in Figure 4.

DISCUSSION

Surgical Site Infections are still a threat to the surgical world. Antibiotic prophylaxis is one component of preventive strategy against SSIs. A prospective observational study was carried out by reviewing the prescription of 300 patients who underwent surgical antibiotic prophylaxis. In our study, patient demographics showed that female patients undergone surgery were more than males and received prophylaxis. Similar results were found in the study conducted by Elbur *et al.* but the study conducted by Rehna *et al.* showed that male patients underwent surgery more than females. Majority of the patients enrolled were between 30-39 years of age. Similar results were observed in the study conducted by Elbur Al et al but the study conducted by Ram et al showed most patients enrolled were of age 50-80 years. The prescribing pattern of surgical antibiotic prophylaxis were recommended in most of the prescriptions. Similar study reported by Rehan *et al.* No preoperative prophylactic antibiotic was prescribed. The effectiveness of preoperative antibiotic prophylaxis is well established. Despite this, surveys have shown that optimal practice isn't achieved in many hospitals.

The most preferred route of administration of surgical antibiotic prophylaxis among the 300 cases were parenteral route than oral route. Similar results but the study of Ram et al reported that oral route of administration of antibiotic was more. Majority of the prescriptions were prescribed with two drugs .Out of 433 prescribed surgical antibiotic prophylaxis, cefotaxim was mostly preferred followed by salbactam, metronidazole. The most preferred surgical antibiotic prophylaxis in 254 prescriptions were cephalosporins followed by beta lactamase inhibitor nitroimidazole, and fluroquinolone. Out of 154 antibiotic prescribed in the patients undertaken surgical prophylaxis, cefaperazone+ sulbactam was the most commonly prescribed regimen followed by ciprofloxacin + metronidazole and cefotaxim + metronidazole. Out of 254 cases, the first dose of surgical antibiotic surgical prophylaxis was administered more than 2 hour before operation. In 31 cases out of 46 cases, prophylactic antibiotics were not prescribed as it is not recommended as per ASHP guidelines.

None of the patients received cefazolin as recommended by ASHP guidelines. Further all patients undergoing surgery for simple fractures and dermatological procedures received preoperative antibiotics while no such prophylaxis is recommended as per ASHP guidelines.

REFERENCES

- Abula T., Kedir M. 2004. The pattern of antibiotic usage in surgical in-patients of a teaching hospital, northwest Ethiopia. *Ethiop. J. Health Dev* 18(1):35-38.
- Al-Azzam SI., Alzoubi KH., Mhaidat NM., Haddadin RD., Masadeh MM., Tumah HT. et al. 2012. Preoperative antibiotic prophylaxis practice and guideline adherence in Jordan: a multi-center study in Jordanian hospitals, *J Infect Dev Ctries* 6(10):715-720.
- Elbur AI., Yousif MAER., ElSayed ASA., Abdel-Rahman ME. 2012 An audit of prophylactic surgical antibiotic use in a Sudanese Teaching Hospital, *Int J Clin Pharm.*
- Giri BR., Pant HP., Shankar PR., Sreeramareddy CT., Sen PK. 2008. Surgical site infection and antibiotics use pattern in a tertiary care hospital in Nepal, *J Pak Med Assoc* 58(3):148-150.
- Lim M K et al. 2015. Antibiotics in surgical wards: use or misuse? A newly industrialized country's perspective, *J Infect Dev Ctries* 9 (11): 1264- 71.
- Palmer NAO., Pealing R., Ireland RS., Martin MV. 2000. A study of prophylactic antibiotic prescribing in National Health Service general dental practice in England, *Br Dent J* 89(1):43-46.
- Radji M., Aini F., Fauziyah S. 2014. Evaluation of antibiotic prophylaxis administration at the orthopedic surgery clinic of tertiary hospital in Jakarta, Indonesia, *Asian Pac J Trop Dis* 4(3): 190-03.
- Raghu Ram VG., VidyaSagar RA., Gopala Krishnan G, Senthivelan M. 2014 Surgical antibiotic prophylaxis in a tertiary care teaching hospital in India, *World J Pharm PharmSci* 3(7):968-76.
- Rehan HS., Kakkar AK., Goel S. 2010 Surgical antibiotic prophylaxis in a tertiary care teaching hospital in India, *Int J Infect Control* 6(2):1-6.
- Saleh P., Bastani P., Piri R., Goldust M., Behzad MN. 2013. Antimicrobial Prophylaxis for Surgical Site Infections in Surgical Wards in NorthWest Iran, *Life Sci J.*
