



Original Research Article

Pattern of antibiotics use for surgical prophylaxis in a rural tertiary care teaching institution

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ABSTRACT

Background: Antibiotics are most commonly used prophylactically in a surgical set up. Avoidance of infection helps in early wound healing. Various guidelines are available for the use of antibiotics for surgical prophylaxis. Indiscriminate use of wide spectrum, newer antibiotics has lead to the problem of antibiotic resistance. Our aim was to evaluate the gap between the guidelines and the choice of antibiotics in a tertiary care hospital located in the sub Himalayan area.

Materials and Methods: Data of all the patients who underwent surgery was analysed.

Results: Record sheets of total 746 cases were included in the study. 376 (50.4%) patients were males and 370 (49.6%) were females. Maximum numbers of patients were from age group 36-45 years. Mean age \pm SD of patients was 40.57 \pm 17.46.

572 (76.6%) patients stayed in hospital for 2 to 10 days, 138(18.5%) for 11 to 20 days, 24(3.3%) for 21 to 30 days, 6(.8%) for 31 to 40 days and 6 (.8%) for >40 days.

274 (36.6%) patients suffered from Hepatobiliary diseases, appendicitis was in 99 (13.3%), gastro-intestinal diseases in 98 (12.2%), hernias in 93 (12.47%), urinary system diseases in 30 (4.21%), male genital system diseases in 28 (3.75%), breast diseases 27 (3.62%), rectal and peri-anal diseases in 25 (3.35%), spinal diseases 16 (2.12%), brain diseases 14 (1.88%) other diseases in 43 (5.76%). Commonest antibiotic used was cefuroxime.

Conclusions: The hepatobiliary disease was the commonest reason to undergo surgery.

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1. Introduction

The antibiotics are important drugs used prophylactically and therapeutically in surgical settings.¹ They help in decreasing the mortality and duration of hospital stay. The choice of antibiotics is often not guided by current guidelines.²⁻⁵ If the antibiotics are used in a rational way, surgical site complications are reduced.⁶

1.1. Objective of the study

To Evaluate the prescribing pattern of antimicrobial agents in the Department of Surgery, Dr Rajendra Prasad government medical college, Kangra at Tanda, Himachal Pradesh.

1.2. Methodology

This was a cross sectional, observational study of the indoor patients in the department of surgery at Dr. Rajendra Prasad Government Medical College (DRPGMC), Kangra at Tanda.

Data collection: After permission from the authorities, the record sheets were accessed from the record section

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of the institution and analysed regarding age, gender, demographic data, date of admission, date of discharge, chief complaint of the patient, diagnosis, surgical procedure, and the drugs administered.

The Study duration

1.3. Inclusion criteria

Record of all the patients discharged during the period

1.4. Exclusion criteria

Incomplete/illegible records

2. Results

Total 746 record sheets were included in the study.

376 (50.4%) patients were males and 370 (49.6%) were females. Maximum number of patients was from age group 36-45 years. The mean age +/- SD of patients was 40.57 +/- 17.46. (Figure 1)

572 patients stayed in hospital from 1 to 10 days, 138 from 11 to 20 days, 24 from 21 to 30 days, 6 from 31 to 40 days and 6 for >40 days. (Figure 2)

2.1. Antibiotic use

No antibiotic was used in 31 cases; used for less than 24 hours in 30 cases and for more than 24 hours in 685 cases (Table 1). 516 patients were given the same antibiotic pre and post-operatively. In 230 (30.8%) patients antibiotics were changed immediately after surgery.

2.2. Pattern of Antibiotic use

Cefuroxime in 346 patients (22.84%), Metronidazole in 275 (18.16%), amoxicillin+clavulanate in 228 (15.04), ceftriaxone in 185 (12.22%), Ofloxacin+ornidazole in 96 (6.34%), Ceftriaxone+sulbactam in 87 (5.74%), piperacillin+tazobactam 39 (2.58%), ciprofloxacin 28 (1.85%), cefoperazone+sulbactam 25 (1.65%), amikacin 20 (1.3%), others 186 (12.28%) which included 39 different other antibiotics. A total of 49 choices of antibiotics/ FDCs were used. (Figure 4)

The pattern of choice of various antibiotics in the preoperative and post-operative period is depicted in Fig. 6 which shows increased use of wide spectrum newer antibiotics and metronidazole post operatively.

Average number of antibiotics used per patient was 2.03. (Table 1)

2.3. Global Report on Diabetes

3. Discussion

The demographic analysis showed nearly equal proportion of patients of either gender. Most common surgical

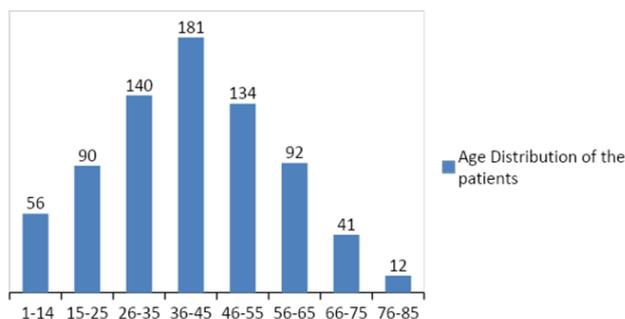


Fig. 1: Age distribution of patient (N=746)

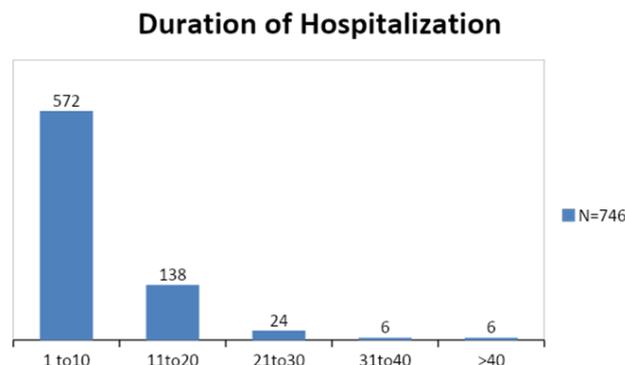


Fig. 2: Duration of hospital stay in days

SYSTEM WISE CLASSIFICATION OF DISEASES

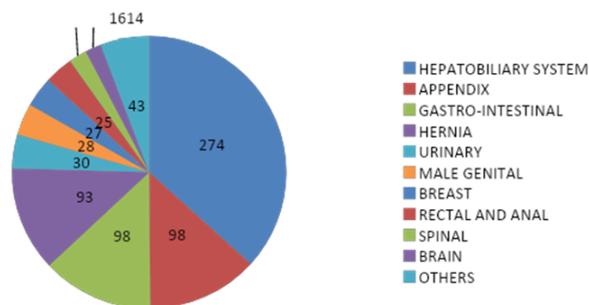


Fig. 3: System wise classification of diseases

Table 1: Period of antibiotic use

No of Days of post-operative antibiotic use.		
No. of days	No. of cases	Percentage
0 (Not used)	30	4.02%
1	31	4.16%
2 to 10	543	72.79%
11 to 20	96	12.87%
21-30	32	4.29%
>30	14	1.87%

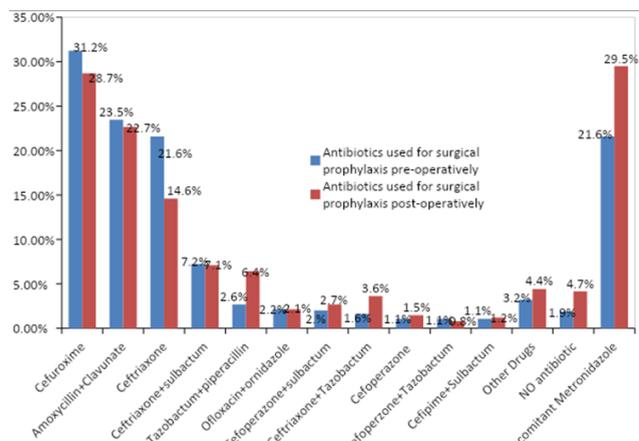


Fig. 4: Pattern of antibiotics use in pre and post-operative patients

intervention was for cholelithiasis in 265 patients (228 females and 37 males) (Figure 3). Most common surgical indication in males was inguinal hernia (72 patients). Most common age group of patients was 36 to 45 years and 456 patients (61%) were from 26 to 55 years of age.

All the preoperative prophylactic antibiotics were given within 60 min pre surgery. Cefuroxime was the most commonly used antibiotic, though not recommended by various guidelines, which recommend cefazolin, cefoxitin, cefotetan, ceftriaxone, ampicillin–sulbactam were used less commonly.^{7–10}

Total number of choices of antibiotics used was 49 which show wide variability in choice of antibiotics used and non-adherence to guidelines. This may lead to multidrug resistance

Most of the patients were discharged within ten days of admission which may be the result of good infection control, use of wide spectrum antibiotics and low rate of postoperative complications.

In 230(30.8%) patients antibiotics were changed immediately after surgery. This may be partially the result of changed surgical wound contamination status but also due to indifference of the prescriber to the use of same antibiotic both pre and post operatively. An 8% increase in the use of metronidazole and 4% increase in the use of Piperacillin tazobactam post operatively is quite reasonable which is an indicator of stepping up antibiotic coverage for changed surgical wound contamination status during surgical procedure. In few cases (4.7%) no antibiotic was used which is representative of awareness of the prescriber to rational use of antibiotics and guidelines of antibiotic prophylaxis. But lack of confidence in asepsis may be the reason for high number of patients receiving prophylactic antibiotics.

4. Conclusion

The choice of treating surgeon, rather than guidelines, was used to choose the antibiotics. There is no hospital antibiotic

policy in place.

The hospital should frame an antibiotic policy and guidelines, based on culture sensitivity reports of samples collected from its wards and operation theatres, so that surgeons feel confident to follow a rational antibiotic usage pattern and decrease the use of newer broad spectrum antibiotics. The prescribers should be educated about the national antibiotic policy and sensitised about the impending catastrophe of antibiotic resistant infections. Also the preventive measures to combat surgical wound infection should be made a habit by involving and sensitizing all the health care personnel interacting with patients. Recognizing good infection control practice by giving public appreciation and feedback for lapses in infection control to the health professionals may be helpful in decreasing the infection rate among surgical patients and thus improving antibiotic use behavior.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

- Munckhof W. Antibiotics for surgical prophylaxis. *Aust Prescr.* 2005;28(2):38–40.
- Mallapur AS, Kalburgi, Mallappa H, Shalavadi, Veerakumar, Vibhavari W, et al. Evaluation of rational use of antibiotics as surgical prophylaxis in a tertiary care teaching hospital. *Med Innovatica.* 2014;3:15–20.
- Musmar SM, Ba'ba H, Owais A. Adherence to guidelines of antibiotic prophylactic use in surgery: a prospective cohort study in North West Bank, Palestine. *BMC Surg.* 2014;14(1):69.
- Gouvêaa BM, Novaesc OC, Pereirad MD, Iglesias CA. Adherence to guidelines for surgical antibiotic prophylaxis: a review. *Braz J Infect Dis.* 2015;19:517–24.
- Ng RS, Chong CP. Surgeons' adherence to guidelines for surgical antimicrobial prophylaxis -a review. *Australas Med J.* 2012;5(10):534–40.
- Kaur RR, Salman MT, Gupta NK, Gupta U, Ahmad A, and VKV. Pre-surgical Antibiotic Prophylaxis Pattern in an Indian Tertiary Care Teaching Hospital. *JK Sci.* 2015;17(2):73–8.
- Telfah S, Nazer L, Dirani M, Daoud F. Improvement in Adherence to Surgical Antimicrobial Prophylaxis Guidelines after Implementation of a Multidisciplinary Quality Improvement Project. *Sultan Qaboos Univ Med J.* 2015;15(4):e523–7.
- Bratzler DW, Dellinger EP, Olsen KM, Perl TM, Auwaerter PG, Bolon MK, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health-Syst Pharm.* 2013;70(3):195–283.
- Scottish Intercollegiate Guidelines Network (SIGN); 2008. Available from: <http://www.sign.ac.uk> updated 2014.
- Brunton LL, Hilal-Dandan R, Knollmann BC. Goodman Gilman's Pharmacological Basis of Therapeutics. 13th. vol. 864. New York: Mc Graw Hill Publications; 2013.

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