



**PATTERN OF ANTIBIOTIC THERAPY AND EFFECTIVENESS IN
GASTROINTESTINAL SURGERIES**

Ibel C. Fredy^{1*}, Santosh Chandrasekhar¹, R. Srinivasan² and Lohith K. B.³

¹Doctor of Pharmacy.

²HOD, Department of Pharmacy Practice.

³Doctor of Pharmacy (Intern) PES College of Pharmacy.

Corresponding Author: Ibel C. Fredy

Doctor of Pharmacy.

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ABSTRACT

Surgical site infection is one of the most common healthcare-associated infection in patients undergoing surgery and remains a major source for post-operative morbidity. This encourages surgeons to adopt a more liberal approach toward prescribing antibiotics. In practice this may seem beneficial in reducing infection rates in inpatient setting, but can potentially lead to emergence of more resistant microorganisms. Thus, resulting in worsening of patient condition as well as increased health-care costs. Purpose of our study is to identify pattern of antibiotic usage in various GI surgeries and its effectiveness. It is a cross-sectional Retrospective study. Data analyzed by Microsoft excel. Appropriateness of antibiotic therapy was evaluated based on compliance with ASHP Therapeutic Guidelines and response to the treatment Over the study period, a total of 652 patient profiles were collected. Surgical procedures performed were appendectomy (45, 6.90%), gastroduodenal procedures (141, 21.66%), laparoscopic procedures (104, 15.97%), small intestine obstruction removal (23, 3.53%), hernia repair (86, 13.21%), colorectal procedures (150, 23.04%), cancer surgery (38, 5.84%), hepatic surgeries (31, 4.75%) and other (33, 5.10%). The antibiotic therapy for the above procedures was compared with American Society of Health-System Pharmacists therapeutic guidelines and found to have lack of adherence to the guidelines.

KEYWORDS: Surgical Site Infection, Antibiotics, Gastrointestinal Surgeries.

Declaration

This Title and study was selected as Poster for ACCP Virtual poster symposium 2016 and presented on Wednesday, May 18th and Thursday, May 19th, 2016 from 7:00 p.m. to 9:00 p.m. (EDT) And available in conference proceedings.

INTRODUCTION

Antibiotics are one among the most important drugs prescribed in hospitals. It has been expected that up to a third of all patients receive at least one antibiotic during hospitalisation.^[1]

There are many studies conducted in developed countries on pattern of antibiotic usage but studies exploring the appropriateness of antibiotic use among surgical patients are limited, particularly in developing countries.

Surgical site infection is one of the most common healthcare-associated infections in patients undergoing surgery and remains a major source for post-operative morbidity. Antibiotics are commonly used in surgical patients as approximately 30% of patients undergoing surgery will develop post-operative surgical site infections (SSI).^[2] Prevention and management of

infection is vital as post-operative SSI alone can prolong hospitalization, double readmission rates, triple the cost of treatment, even cause severe morbidity and mortality.^[3]

Patients who experience SSIs are up to 60% more likely to get admitted in the Intensive Care Unit (ICU), 5 times more likely for readmission and twice as likely to die compared with patients without a SSI.^[4] Meta-analyses demonstrate that antibiotic prophylaxis is the most effective strategy for preventing SSIs following breast, appendix and colorectal surgery.^[5,6] Infectious complication rates range from 30% to 60% without Surgical Antibiotic Prophylaxis(SAP) whereas lower than 10% with SAP.^[7]

This encourages surgeons to adopt a more liberal approach toward prescribing antibiotics. In practice this may seem beneficial in reducing infection rates in inpatient setting, but can potentially lead to emergence of more resistant microorganisms. Thus, resulting in worsening of patient condition as well as increased health-care costs. Appropriate antibiotic prescribing for the purpose of prophylaxis as well as post-operative purpose in surgical units is of great importance in

ensuring improved quality of care for patient, infection control as well as to prevent proliferation of multi-resistant organisms.^[8,9] our study focusses on the pattern of the antibiotic usage in various gastro intestinal surgical procedures and its effectiveness comparing ASHP guidelines with those in practice.

METHODOLOGY

This cross-sectional retrospective observational study was conducted on 652 patients who underwent various surgical procedures in Gastroenterology department at a quaternary care hospital in India. The study was conducted for a period of one year from January 2015 - December 2015. Data was collected from patient case files and appropriateness of antibiotic therapy was based on compliance with ASHP guidelines. Further statistical analysis was performed using Microsoft Excel.

RESULTS

Demographic details

No of patients: 652 Male: 387 Female: 265 Mean age: 49.56

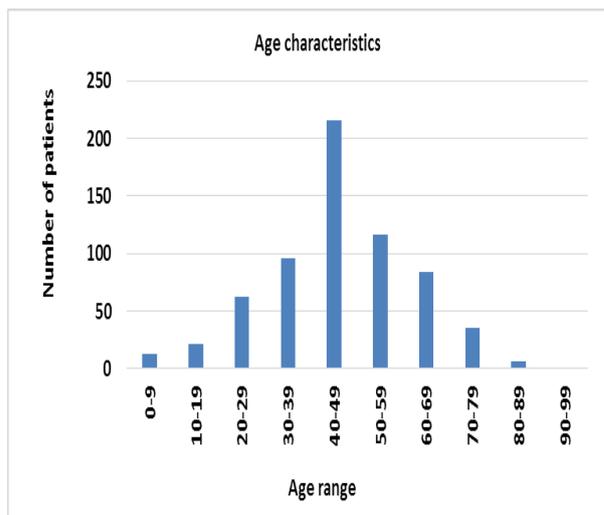


Figure: 1 Age group admitted for various surgical procedures

Table: 1 Suggested antibiotics as per ASHP

Procedures	1st Line	2nd Line
Appendectomy	Cefoxitin, cefotetan, cefazolin + metronidazole	Clindamycin + aminoglycoside or aztreonam or fluoroquinolone
Gastro-duodenale procedures	Cefazolin	Clindamycin or vancomycin + aminoglycoside or aztreonam or fluoroquinolone
Laparoscopic procedures	Cefazolin, cefoxitin, cefotetan, ceftriaxone, ampicillin / sulbactam	Clindamycin or vancomycin + aminoglycoside or aztreonam or fluoroquinolone
Small intestine obstruction removal	Cefazolin + metronidazole, cefoxitin, cefotetan	Metronidazole + aminoglycoside or fluoroquinolone
Hernia repair	Cefazolin	Clindamycin, vancomycin
Colorectal procedures	Cefazolin + metronidazole, cefoxitin, cefotetan, ampicillin / sulbactam, ceftriaxone + metronidazole, ertapenem	Clindamycin + aminoglycoside or aztreonam or fluoroquinolone + metronidazole + aminoglycoside or fluoroquinolone
Cancer surgeries	Cefazolin + metronidazole, cefuroxime + metronidazole, ampicillin / sulbactam	Clindamycin
Hepatic surgeries	Piperacillin / tazobactam, cefotaxime + ampicillin	Clindamycin or vancomycin + aminoglycoside or aztreonam or fluoroquinolone

Table: 2 Antibiotics prescribed in practice.

Procedures	Antibiotics prescribed
Appendectomy	Amoxicillin / Clavulanate ± Metronidazole or Piperacillin / Tazobactam
Gastro-duodenale procedures	
Clean surgery:	Amoxicillin/Clavulanate
Pancreatitis:	Cefoperazone Sodium
Severe pancreatitis:	Meropenam ± Polymyxin E
Laparoscopic procedures	Amoxicillin / Clavulanate
Small intestine obstruction removal	Piperacillin / Tazobactam ± Metronidazole

Hernia repair	Amoxicillin / Clavulanate
Colorectal procedures	Amoxicillin / Clavulanate
Cancer surgeries	Amoxicillin / Clavulanate or Piperacillin / Tazobactam
Hepatic surgeries	Piperacillin / Tazobactam ± Metronidazole
Others	Amoxicillin / Clavulanate or Piperacillin / Tazobactam or Cefoperazone Sodium

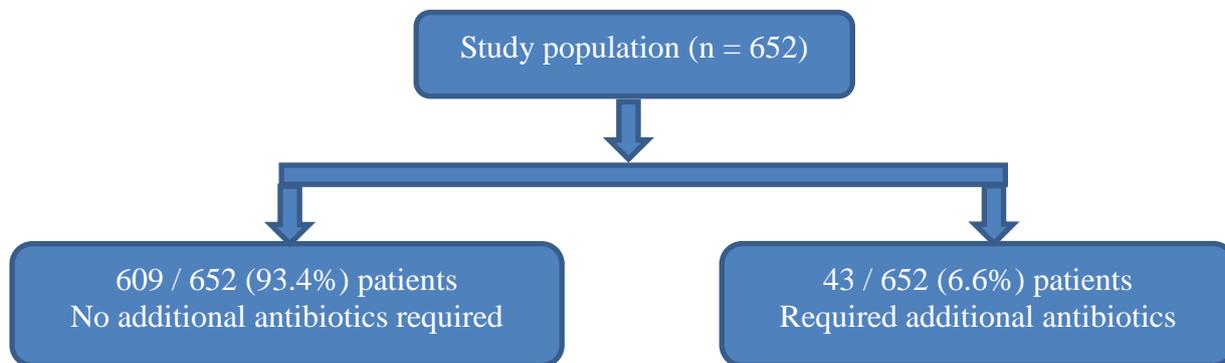


Figure: 2 Effectiveness of antibiotics therapy

Table: 3 Various Surgical procedures performed

Procedures	Number
Appendectomy	45
Gastro-duodenale procedures	141
Laparoscopic procedures	104
Small intestine obstruction removal	23
Hernia repair	86
Colorectal procedures	150
Cancer surgeries	38
Hepatic surgeries	31
Others	33

DISCUSSION

Our study consisted of 652 patients, of which 387 were Male and 265 were Female, with a mean age of 49.56 years. Patients under went the following surgical procedures appendectomy (45, 6.90%), gastro-duodenale procedures (141, 21.66%), laparoscopic procedures (104, 15.97%), small intestine obstruction removal (23, 3.53%), hernia repair (86, 13.21%), colorectal procedures (150, 23.04%), cancer surgery (38, 5.84%), hepatic surgeries (31, 4.75%) and other (33, 5.10%). Analysis for the appropriateness as well as effectiveness of prescribed antibiotics was compared to the current American Society of Health-System Pharmacists (ASHP) guidelines for antimicrobial prophylaxis in surgery.

Evaluation of effectiveness of antibiotics in prescribed therapy indicated 93.4% of population received appropriate therapy and 6.6% required additional antibiotics. This may be due to difference in patient characteristics or even due to the presence of resistant microorganisms. Our study found ASHP therapeutic guidelines were not followed by the variation in

antibiotic regimens employed for both therapeutic as well as prophylactic purposes.

CONCLUSION

The lack of compliance with ASHP guidelines was clearly evident which maybe for several reasons. Although the guidelines were disseminated to hospitals; the actual awareness of information within hospital was less than satisfactory. There was also a lack of audit system for the antibiotic usage which could also contribute to lack of compliance. Many doctors were not aware these guidelines existed which demands for greater involvement of practicing doctor in deciding more hospital specific policy on antibiotics.

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