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STUDY ON USAGE OF ANTIBIOTICS IN EMERGENCY GASTROINTESTINAL SURGERY PATIENTS

STEFFY RH[1*], MONISH KUMAR J[1], VEERAMANI G[2] AND KABALIMURTHY J[3]

1: Department of Pharmacy, Annamalai University, Annamalai Nagar – 608 002

2: Assistant professor, Department of pharmacy, Annamalai University, Annamalai Nagar – 608 002

3: Professor and Head, Department of Surgery, Rajah Muthiah Medicine Collage & Hospital, Annamalai University, Annamalai Nagar – 608 002

***Corresponding Author: R.H. Steffy: E Mail: rhsteffy31@gmail.com; Tel: +918489657104**

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ABSTRACT

OBJECTIVE: To observe the antibiotics usage in post- operative emergency gastrointestinal surgeries and to assess the adherence of patients to the antibiotics prescribed and to observe the adverse effects of drug if any for achieving good clinical outcomes in the patients undergoing emergency gastrointestinal surgeries by educating the patients on the use of antibiotics

METHODS: A prospective observational study was conducted in the department of Medicine, Raja Muthiah Medical Collage Hospital (RMMCH), Chidambaram, India over a period of 6 months. Patients details were collected using self-designed patient proforma. Patient's medication adherence was assessed using MORISKY SCALE and patients were counselled regarding antibiotics use with the help pf pictograms and information leaflets

RESULTS AND DISCUSSION: A total of 60 patients were enrolled in the study out of which more number of patients were male belonging to 18 to 33 years. Most commonly prescribed antibiotics were cefotaxime and metronidazole. Mostly combinations of antibiotics were used in treatment. Medication adherence was significantly improved 17% as the impact of our patient counselling.

CONCULSION

We observed cephalosporin and nitroimidazole category drugs were given most probably in emergency gastro intestinal surgeries.

Keywords: Antibiotics, emergency surgeries, gastrointestinal surgery, appendicitis, usage of antibiotics

INTRODUCTION

Every year 60 to 70 million people are affected by gastro intestinal disease. In this 15 million people are admitted in hospital for emergency gastrointestinal surgeries. Where 245,921 deaths are occurring due to complications seriousness. Emergency gastrointestinal surgeries are nowadays most common in geriatrics patients due to age and Illness occurring within them. The major cause of seriousness in surgical site infection, infection, pain, bleeding, blood clots and damage to another body part.

Prophylactic use of antimicrobials and other preparation before surgery have shown significant reduction in infectious complication. The essential spectrum for coverage in gastrointestinal surgery is decided by the flora found within the patient's large intestine. This is a mixture of both anaerobic and aerobic bacteria along with than introduction of bacteria from the patient's skin or the operating room, so antibiotic choices that protect against both anaerobic and aerobic bacteria showed the best results **[1]**.

Certain gastrointestinal disorders can be life threatening and require emergency treatment. Emergency surgery of the abdomen is often done when the abdominal pain seems to result from intestinal obstruction, ruptured or perforated (punctured) organs (such as the stomach, appendix or intestine), hernia with too little blood flow, blockage of blood flow (like Acute Mesenteric Ischemia and Ischemic Colitis) and abdominal abscess (a pus-filled pocket of infection) **[2]**.

Some emergency gastrointestinal surgeries are acute appendicitis, sigmoid volvulus, hollow viscus perforation. The treatment of postoperative bacterial or fungal infections comprises of cause control, antimicrobial cure, supportive and adjunctive approaches with the help of various types of antimicrobials. In this study, we explored the various prophylactic and postoperative antibiotics that can be used to reduce morbidity and mortality in emergency gastrointestinal surgery **[1]**.

MATERIALS AND METHODS

A record based observational study was conducted at Rajah Muthiah Medical College and Hospital [RMMCH], rural 1400-bed multispecialty, tertiary care teaching hospital, Annamalai University, Annamalai Nagar, Tamil Nadu, from the period of November 2018 to April 2019.

Inclusion Criteria

Patients who have undergone emergency gastrointestinal surgeries and of age above 18 years of either gender.

Exclusion Criteria

The pregnant women are excluded from our study and the patients who are not willing to participate.

RESULTS

A total of 60 patients were included which was a male predominant study consisting of Males 49 (81.66%) and Females 11(18.33%). About 49 (81.66%) patients came under the age group of 18-33 years and 8 (13.33%) under the age group of 34-49 and 3(5%) under the age group of 50-65 **(Table 1)**. Most emergency gastrointestinal surgeries took place at the age of 18 to 33 in our hospital. Mostly males were affected more compared to females.

Out of 60 patients that were included for the study, 52(86.66%) patients had appendicitis, 6(10%) patients had hollow viscus perforation, 2(3.33%) patients had sigmoid volvulus **(Table 2)**. Majority of the surgical procedure enrolled in our study are Laparotomy (83.33%) followed by Laparoscopy (11.66%).

Furthermore in this study, it was found that 155 antibiotics were used in 60 patients, among which highest group of antibiotics prescribed were third generation cephalosporin. The prescribing pattern of the antimicrobials were Cephalosporin - 50(32.25%), Nitroimidazole – 57 (36.77%), Aminoglycoside – 16 (10.32%), Penicillin + Beta lactamase inhibitor – 14 (9%), Fluroquinolones – 12 (7.74%), Carbapenems – 4 (2.58%), Oxazolidine – 1 (0.64%), Penicillin – 1(0.64%). The most frequently prescribed antibiotics were metronidazole – 36.77% followed by ceftriaxone – 30.96% of the class cephalosporins. The total number of fixed drug combination was piperacillin and tazobactam – 9% **(Table 3, Figure 1)**.

Among all the antibiotics, metronidazole acquired the top prescribed antibiotic and the next was ceftriaxone followed by gentamycin, ciprofloxacin, meropenem, amikacin, cefuroxime, cefixime, ofloxacin and so on.

Table 1: Demographic Data of Patient

PARAMETER	PERCENTAGE (N= 60)	
GENDER	MALE	49(81.66%)
	FEMALE	11(18.33%)
AGE	18-33	49(81.66%)
	34-39	8(13.33%)
	50-65	3(5%)

Table 2: Disease Pattern In Surgery During Study Period

S. No.	DIAGNOSIS	NO. OF CASES	PERCENTAGE (%)
1	APPENDICITIS	52	86.66%
2	HOLLOW VISCUS PERFORATION	6	10%
3	SIGMOID VOLVULUS	2	3.33%

Table 3: Category of Antibiotics Prescribed

S. No.	ANTIBIOTICS	NO. OF ANTIBIOTICS (percentage)
1	Cephalosporin	50 (32.25%)
2	Nitroimidazole	57 (36.77%)
3	Aminoglycoside	16 (10.32%)
4	Penicillin + Betalactamase inhibitor	14 (9%)
5	Fluoroquinolones	12 (7.74%)
6	Carbapenems	4 (2.58%)
7	Oxazolidine	1 (0.64%)
8	Penicillin	1 (0.64%)

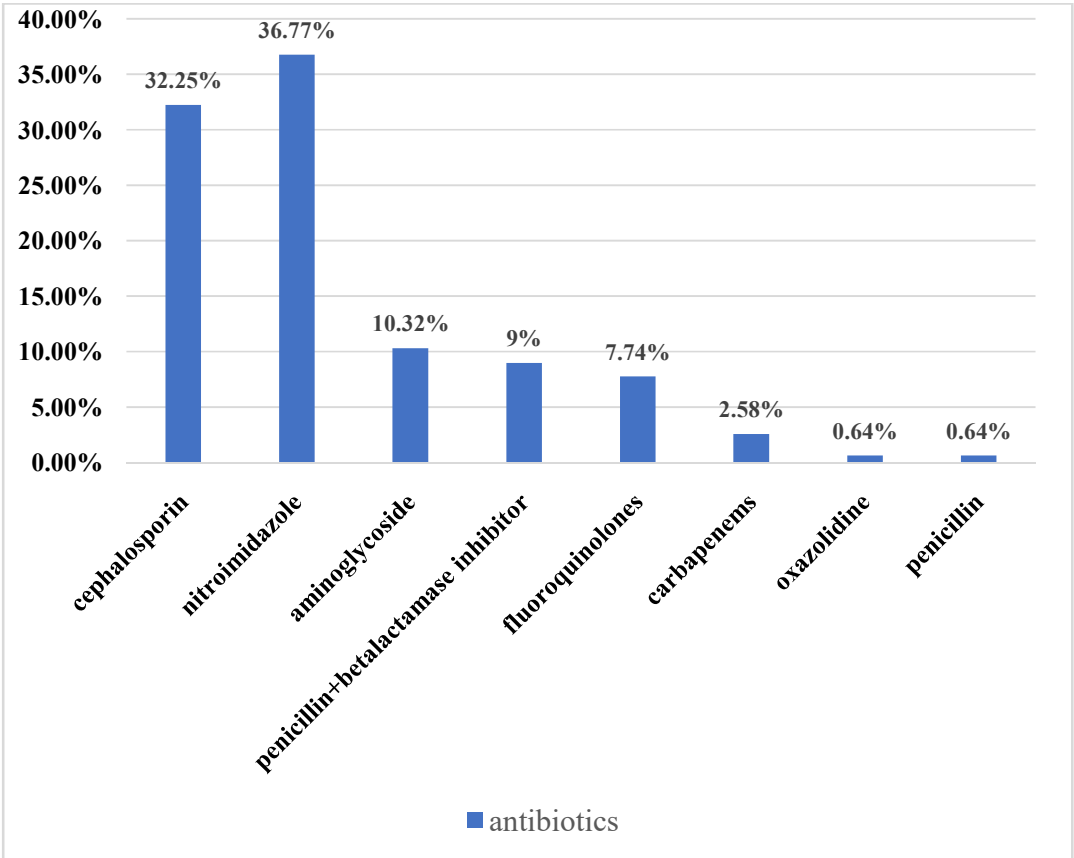

Figure 1: Category of Antibiotics Prescribed

DISCUSSION

Surgical antibiotic prophylaxis is an adjunct to, not a substitute for good surgical technique. Antibiotic prophylaxis should be regarded as one of the components of an effective policy for the control of health care associated infection. Prophylactic administration of antibiotics inhibits the growth of contaminating bacteria and their adherence to prosthetic implants, thus reducing the risk of infections **[3]**. Improper administration of antibiotics also increases the prevalence of antibiotic resistant bacteria **[3]**.

Patients in surgical ward develop infections post-surgery; many of the infections that are caused by bacteria's are highly virulent. The use of antibiotics in surgical patients both for prophylaxis and treatment of infections is a justifiable practice that however requires a regular review of the chosen regimen on the grounds of efficacy, diagnosis pattern, prescribing pattern and the aspects to maximize the benefits to the patients **[4]**. Antibiotics are most commonly prescribed drugs in hospitals and developed countries around 30% of the hospitalized patients are treated with antibiotics.

This prospective study attempts to assess the general pattern of how antibiotics are used in surgical wards which were conducted for the duration of 6 months, in which 60 patients were enrolled in accordance to the studies inclusion criteria. According to SIGN guidelines the goals of prophylactic administration of prophylactic administration of antibiotics to reduce the incidence of SSI, use of antibiotics in a manner that is supported by evidence of effectiveness, minimize the effect of antibiotics on the patients normal bacterial flora, minimize adverse effects and cause minimal change to the patients host defences **[5]**.

In our study, among the total group of 60 patients there were 49 (81.66%) male and 11 (18.33%) female patients. From the total number of patients, the maximum number of patients operated for different surgeries were found to be 49 i.e.., (81.66%) lying under the age group of 18 to 33 years, and the minimum group of patients admitted were 8 i.e.., (13.33%) lying under the age group of 34 to 49 years and the minimum group of patients admitted were 3 i.e.., (5%) of the age group 50 to 65. Similar study was conducted on pattern of antibiotic at surgery department in tertiary care hospital at Maharashtra which also had similar distribution, i.e., male patients are greater than female patients.

Moreover in this study, all the cases were classified into three surgeries. They are appendicitis, hollow viscus perforation,

sigmoid volvulus. Similar study was conducted on antibiotics prescribing pattern in surgical ward of department of surgery at Rajah Muthiah Medical Collage Hospital in TamilNadu in 2014 which also had the similar diagnosed pattern of cases appendicitis followed by diabetic foot ulcer, hernia etc..

In this study, it was fount that 155 antibiotics were used in total of 60 patients, among which highest group of antibiotics prescribed were metronidazole (36.77%) followed by ceftriaxone (32.25) and then gentamycin (10.32%). Another study which was conducted in prescribing patterns of antibiotics in post-operative patients in teaching hospital in Hyderabad in 2014 which also had similar antibiotic prescribing pattern, among which highest group of antibiotics prescribed were third generation cephalosporin **[6]** comprising 44% and then 30.7% metronidazole **[7]**.

Cephalosporin is a very important class of drugs which have been prescribed extensively as an antimicrobial in the treatment of acute and chronic bacterial infection. They have been very successful in treating and controlling infections. However, there are growing numbers of reports of resistance to these agents with increasing use. Cephalosporin's usage pattern exerts a significant influence over the rates of resistance observed and led to problematic multidrug resistant nosocomial pathogens **[8]**.

Similarly a study conducted at tertiary care hospital in Maharashtra in surgery department on antibiotics states that in postoperative 76.34% metronidazole and 47.82% ceftriaxone were prescribed.

CONCLUSION

We observed cephalosporin and nitroimidazole category drugs were given most probably in emergency gastro intestinal surgeries.

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Ethical approval: The study was approved by the Institutional Ethics Committee.

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