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A study on utilization of antibiotics for prophylaxis in post operative wards at a tertiary care teaching hospital

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Abstract

Surgical antibiotic prophylaxis is a very brief course of antibiotics initiated closely before the start of operative procedures to reduce postoperative SSI's. Antibiotic prophylaxis has been shown to be an effective measure for preventing SSIs. This study is to analyse the utilization of antibiotics prescribed for prophylactic treatment among post operative patients. The data were collected by using a pre-designed patient proforma. Out of 151 patients 102 were males (67.5%) and 49 (32.5%) were females. The most performed procedure was Appendectomy 24 (15.8%), followed by hernioplasty 19 (12.5%). The total number of antibiotics prescribed were 341, from which Metronidazole was frequently prescribed 102 (29.7%) followed by Ceftriaxone 73 (21.2%) and Amoxicillin-Clavulanic acid 58 (16.9%). Only 30 patients received antibiotics for 24 hours. SSI was developed in 1 out of 151 patients. ADRs were determined in 5 patients. The outcomes underscore the difficulties in integrating evidence- based protocols seamlessly into everyday clinical practice. Addressing this challenge requires collaborative efforts to establish evidence-based guidelines with surgeons.

Key words: Antibiotics, Surgical Antibiotic Prophylaxis, Surgical Site Infections, Antimicrobial Resistance, Adverse Drug Reactions.

Introduction

Surgical site infections (SSIs) are defined as infections that impact the skin and subcutaneous tissue of the incision (superficial incisional), the deep soft tissue of the incision (e.g., fascia and muscle), and/or any portion of the anatomy (e.g., organs and spaces) other than the incision that was opened or manipulated during an operation and manifest within 30 days of the operation[1]. Surgical antibiotic prophylaxis is a very short course of antibiotics started just before the start of operative procedures to reduce postoperative surgical site infections[2].

An estimated 234 million procedures are carried out globally each year. Surgical Site Infection (SSI) is one of the postoperative complications that accounts for a considerable portion of the mortality rate among surgical patients[8]. Surgical wounds were categorized into four kinds by the American College of Surgeons' National Surgical Quality Improvement Program (ACS NSQIP): clean, filthy, contaminated, and clean/contaminated wound. SSIs are typically associated with many risk factors, such as diabetes mellitus, obesity, and anaemia, usage of corticosteroids, immune suppression medications, and malnutrition. Preoperative skin preparation, skin antisepsis, antimicrobial prophylaxis, length of surgery, and surgical procedures used are similar elements connected to the operation. Other important factors in the development of SSI include preoperative temperature, drain presence, and infection at distant locations. Antibiotics used prophylactically can effectively lower the risk of infection in both contaminated and clean operations. It has been demonstrated that perioperative antibiotic prophylaxis, or PAP, is a successful strategy for SSI prevention[1].

Appropriate antibiotic prophylaxis can effectively lower the risk of surgical site infections. Across the country, inappropriate surgical prophylaxis is still a big issue. Approximately 30–50% of antibiotics used in hospitals are administered for surgical prophylaxis, and 30–90% of this prophylaxis is deemed inappropriate, according to certain research[2]. Most of the time, antibiotic prescriptions were written for longer periods of time than advised by recommendations[4]. According to the recommendations of American Society of Health Care Pharmacists-2013.

In surgical prophylaxis, common principles of an antibiotic include those set out by the American Society of Health-System Pharmacists.

(i) Effective against the microorganisms most likely to contaminate the surgical site and narrow spectrum antibiotics must be preferred.

(ii) Administered at a dose and timing that guarantee sufficient concentrations in blood and tissue during the probable contaminated period.

(iii) Safe.

(iv) Given for the least amount of time necessary to avoid side effects, resistance building, and expense[5].

According to the recommendations for the sensible use of antibiotics,

a) Prophylactic antibiotics should be started one hour prior to the surgical incision (or two hours in the case of patients receiving vancomycin or fluoroquinolones)

b) The prophylactic antibiotics that patients receive should be suitable for the procedure they are undergoing.

c) Prophylactic antibiotics should be stopped 24 hours after the surgery is finished (48 hours in the case of cardio-thoracic surgery).

d) Throughout the procedure, keep the therapeutic concentration of antibiotics in the tissues and serum [6, 7].

Despite possibilities to participate in conventional antimicrobial stewardship, which would adhere to the World Health Organization's worldwide campaign for antimicrobial stewardship, antibiotic abuse among surgeons is frequent. One of the main causes of AMR and ADRs is the irrational use of medications, particularly antibiotics.

The aim of our study is to analyze the utilization of antibiotics prescribed for prophylactic treatment among postoperative patients.

Objectives

- To document the demographic details, surgical history and most type of surgery of patients.
- To assess types of antibiotics prescribed for prophylaxis in post operative patients.
- To assess the effects of prophylactic antibiotic treatment on post-operative conditions.
- To compare the antibiotic prophylactic treatment with Clinical Practice guidelines for antibiotic prophylaxis by American Society of Health-care

Pharmacist (Feb-2013).

- To identify, document and report Adverse Drug Reactions (ADRs) noted among the study population.

Materials and methods

Study site- Post operative wards of General Surgery Department in Sri Venkateswara Ramnarayan Ruia Government General Hospital (SVRRGGH), Tirupati.

Study design- Prospective Observational study in post-surgical ward over a period of 6 months.

Study population- 151 inpatients.

Study duration: (SEPTEMBER - 2023 to FEBRUARY-2024) 6 months.

Study materials-
i) Patient data collection proforma.
ii) Informed consent form.
iii) Clinical practice guidelines for antimicrobial prophylaxis by American Society Health- System Pharmacists (Feb-2013)

Patient selection:
Inclusion criteria: All patients receiving antibiotics in post-operative procedure were included.
Exclusion criteria:
Patients below 18 years.
Patients who are not willing.
Emergency cases are excluded.
Incomplete and illegible information were excluded.
Special population including pregnant women and lactating women.

Ethical consideration: The study was approved by Institutional ethical committee with proposal no: SPSP/ 2023-2024/PD02.

Patient consent form:
The study was performed in general surgery ward, Sri Venkateswara Ramnarayan Ruia Government General hospital, Tirupati after obtaining informed consent from patients.
A patient consent form has been prepared and written consent was obtained from the caregivers. The format contains details like address, date, place, provision for signature of the patient or caregivers, investigator and supervisor. The same is given in the for reference.

Method of data collection:

The data was collected from patient case sheets during ward round participation in the department of General Surgery. Standard data entry format was used to enter all the patient details collected during ward rounds.

Data entry format:

A specially designed data entry format was used to enter patient's details like sociodemographic details, previous history of surgery, type of surgery, hospital stay after surgery, Antimicrobials used (post operatively). The study population will be followed up to the time of discharge and Adverse drug reactions were observed and reported.

The obtained data from post operative wards of General surgery will be evaluated and analyzed by using Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery ASHP Therapeutic (Feb - 2013) guidelines.

Statistical analysis of data:

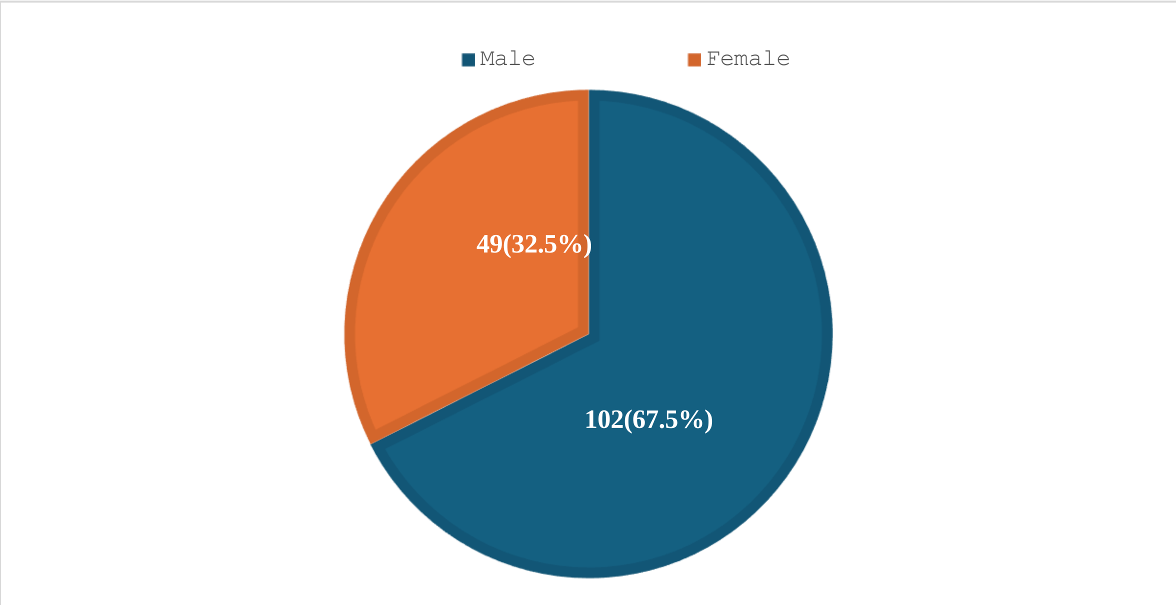
The data collected was analysed by MS Excel version 2016. Descriptive statistics were used, and results were presented. Later One sample t-tests were performed by taking the Surgical Site Infections (SSIs), Administration of narrow spectrum Antibiotics, Discontinuation of Antibiotics within 24, Number of ADRs as factors and Paired Sample t-test was performed for ADRs. A p-value of <0.05 was considered statistically significant. All statistical analysis was performed using IBM SPSS 29.0.2.0, in windows version 11.

Results

1. Gender wise distribution of patients:

Table 6: Gender distribution of inpatients

Gender	Number of inpatients (%) (n=151)
Male	102 (67.5%)
Female	49 (32.5%)



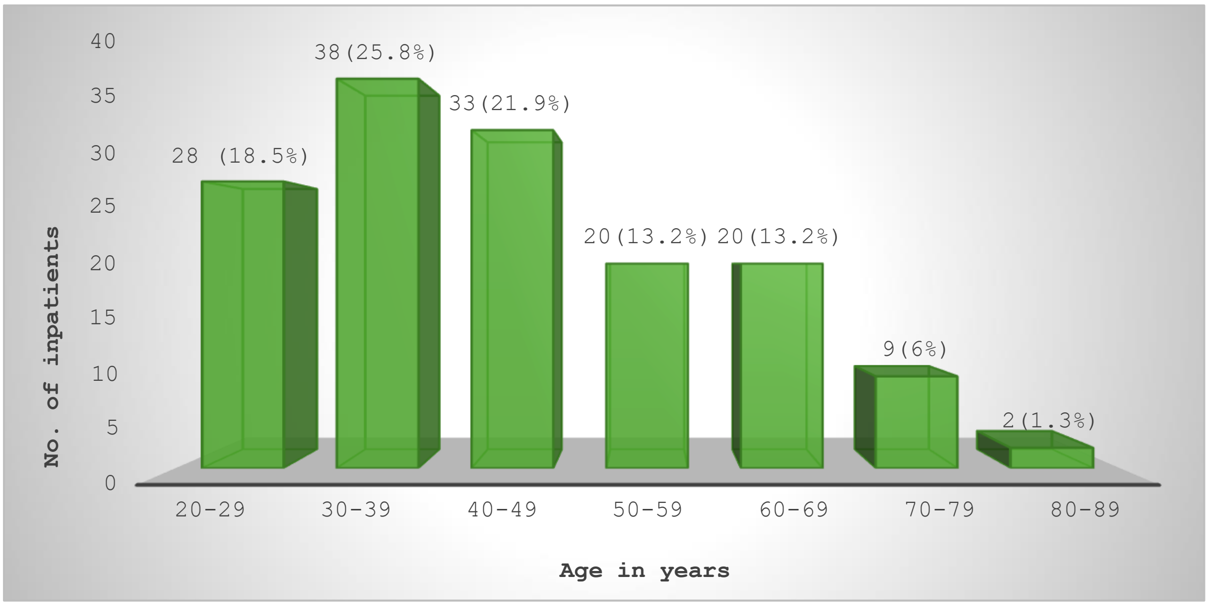
"Figure 1: Gender composition"

In the research, 102 individuals (67.5%) out of the total 151 included patients were identified as males, with females constituting 49 individuals (32.5%).

2. Age wise categorization of inpatients:

Table 7: Insights of Age-stratified distribution of inpatient percentages

S. No	Age in years	Number of inpatients (%) (n=151)	Mean ± S.D
1	20-29	28 (18.5%)	0.81±0.390
2	30-39	38 (25.8%)	0.75±0.435
3	40-49	33 (21.9%)	0.78±0.415
4	50-59	20 (13.2%)	0.87±0.340
5	60-69	20 (13.2%)	0.87±0.340
6	70-79	9 (6%)	0.94±0.238
7	80-89	2 (1.3%)	0.99±0.115



"Figure 2: Insights of age wise distribution of inpatients"

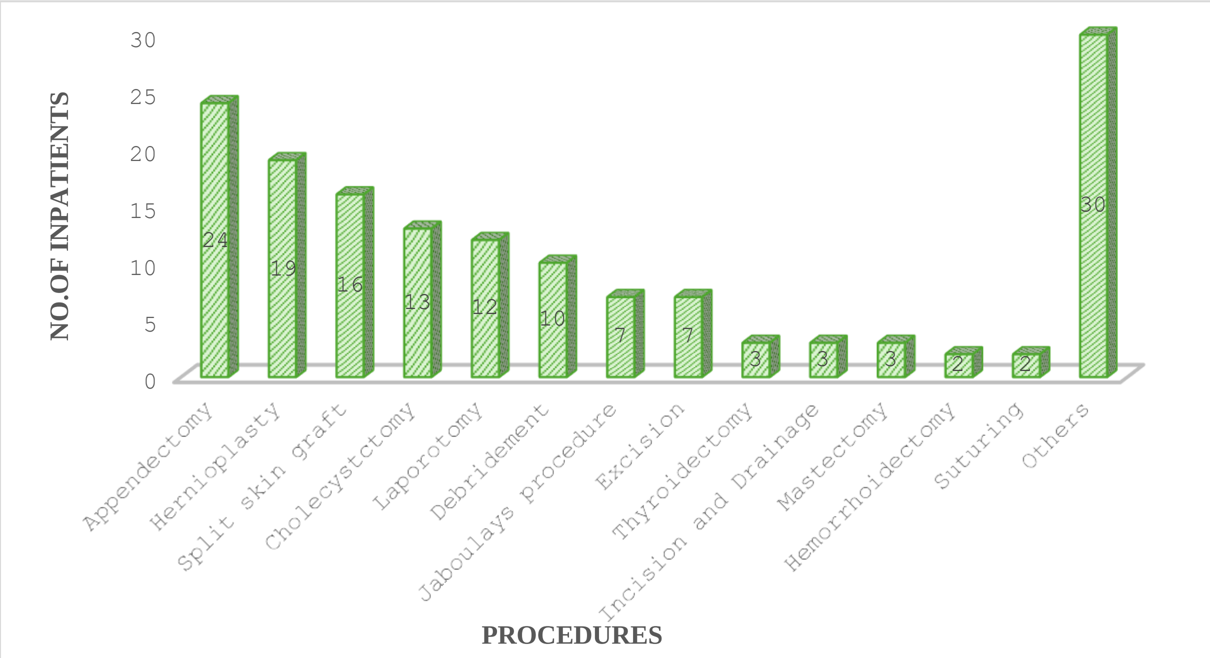
Among the 151 inpatients, the distribution by age group was as follows: 28 (18.5%) were aged 20-29 years, 38 (25.8%) were aged 30-39 years, 33 (21.9%) were aged 40-49 years, and 20 (13.2%) were in both the 50-59 and 60-69 age groups. There were 9 subjects aged 70-79 years and 2 inpatients aged 80-89 years. The mean ± standard deviation for each age group was 0.81 ± 0.390, 0.75 ± 0.435, 0.78 ± 0.435, 0.87 ± 0.340, 0.94 ± 0.238, and 0.99 ± 0.115, respectively. The most prevalent age group among the inpatients was 30-39 years.

3. Types of surgical procedures:

3.1 Classification of surgical procedures performed in the sample population

Table 8: Different categories of surgical procedures observed in the study.

S. No	Type surgery	No of Inpatients (%) (n=151)
1	Appendectomy	24 (15.8%)
2	Hernioplasty	19 (12.5%)
3	Split Skin Graft (SSG)	16 (10.5%)
4	Cholecystectomy	13 (8.6%)
5	Laporotomy	12 (7.9%)
6	Debridement	10 (6.6%)
7	Jaboulays procedure	7 (4.6%)
8	Excision	7 (4.6%)
9	Thyroidectomy	3 (1.9%)
10	Incision and Drainage (I & D)	3 (1.9%)
11	Haemorrhoidectomy	2 (1.3%)
12	Mastectomy	2 (1.3%)
13	Suturing	2 (1.3%)
14	Others	30 (19.9%)

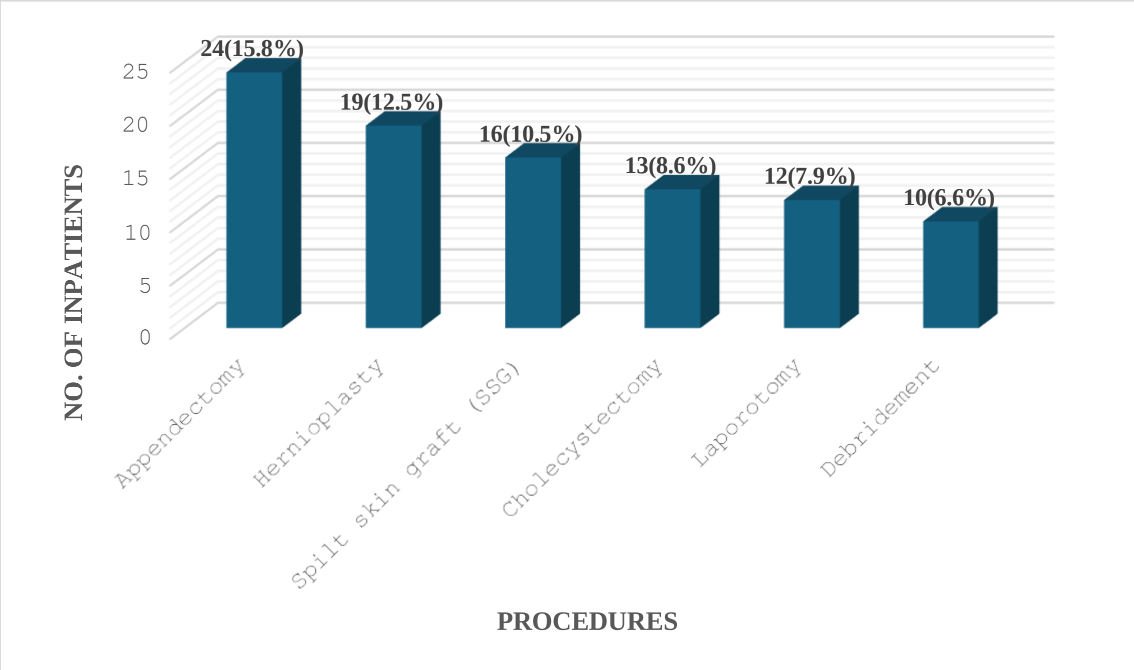


"Figure 3: Surgical categories; Study analysis and graphical representation: graphical representation on surgical procedure typology."

3.2. Most commonly performed surgical procedures among study population:

Table 9: Primary Surgical procedures as identified in the study.

S. No.	Name of surgical procedure	Number of inpatients (n=151)
1	Appendectomy	24 (15.8%)
2	Hernioplasty	19 (12.5%)
3	SSG	16 (10.5%)
4	Cholecystectomy	13 (8.6%)
5	Laporotomy	12 (7.9%)
6	Debridement	10 (6.6%)



"Figure 4: Graphical representation of prevalent surgical interventions"

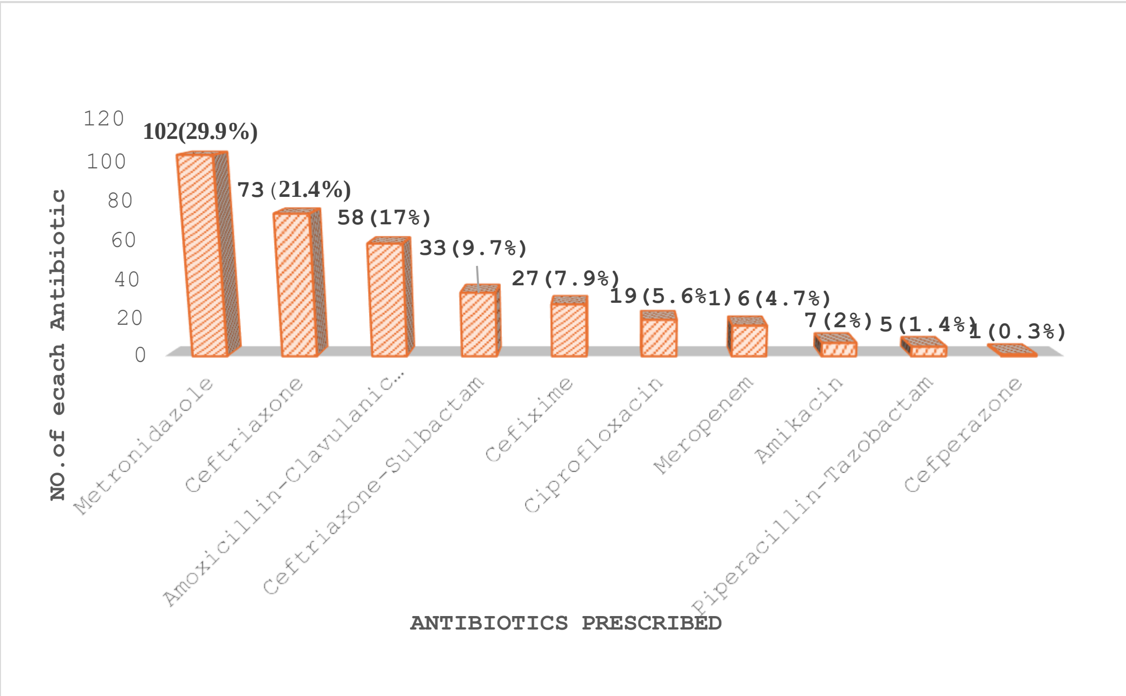
In the scope of our investigation, appendectomy emerged as the most commonly performed surgery, totalling 24 (15.8%) occurrences. Subsequently, hernioplasty was conducted nineteen times, SSG sixteen times, Cholecystectomy thirteen times, Laporotomy twelve times, Debridement eight times with percentages (12.5%), (10.5%), (8.6%), (7.9%) and (6.6%) respectively and several other surgical procedures include Jaboulays procedure, Excision, I & D, Thyroidectomy, Haemorrhoidectomy, Mastectomy, Suturing were also undertaken.

4. Prescription of antibiotics among the study population:

Table 10: Antibiotic prescription analysis and a quantitative distribution with percentages

Antibiotics prescribed	Number of each Antibiotic prescribed (n=341)	Percentage
Metronidazole	102	29.9%
Ceftriaxone	73	21.4%
Amoxicillin-Clavulanic acid	58	17%
Ceftriaxone-Sulbactam	33	9.7%

Cefixime	27	7.9%
Ciprofloxacin	19	5.6%
Meropenem	16	4.7%
Amikacin	7	2%
Piperacillin-Tazobactam	5	1.4%
Cefoperazone	1	0.3%
Total	341	100%



"Figure 5: Antibiotics prescription breakdown with percentage"

In our study, a total of 341 antibiotics were prescribed of which 51.6% were prescribed using generic name sand all 151 patients underwent post-surgical prophylactic antibiotic treatment. Notably, the most frequently prescribed antibiotics were Metronidazole 102 (29.9%), Ceftriaxone 73 (21.4%), and Amoxicillin-Clavulanate 58 (17%). Other antibiotics, in descending order of frequency, included Ceftriaxone-sulbactam 33 (9.7%), Cefixime 27 (7.9%), Ciprofloxacin 19 (5.6%), Meropenem 16 (4.7%), Amikacin 7 (2%), Piperacillin-tazobactam 5 (1.4%) and Cefoperazone 1 (0.3%) (Tab. 8). The third-generation cephalosporin Cefoperazone was prescribed only in one patient.

5. Antibiotic dosage regimen among study population:

TABLE 11: Prescribed dosage regimen of antibiotics

Antibiotics	Dose		Frequency
	IV	PO	
Metronidazole	100ml in NS	400mg	TID
Ceftriaxone	1g	-	BD
Amoxicillin-Clavulanic acid	1.25g	625mg	BD
Ceftriaxone-Sulbactam	1.5g	-	BD
Cefixime	-	200mg	BD
Ciprofloxacin	100ml in NS	500mg	BD
Meropenem	1g	-	BD
Amikacin	500mg in NS	-	BD
Piperacillin-Tazobactam	4.5g	-	BD
Cefoperazone	1g	-	BD

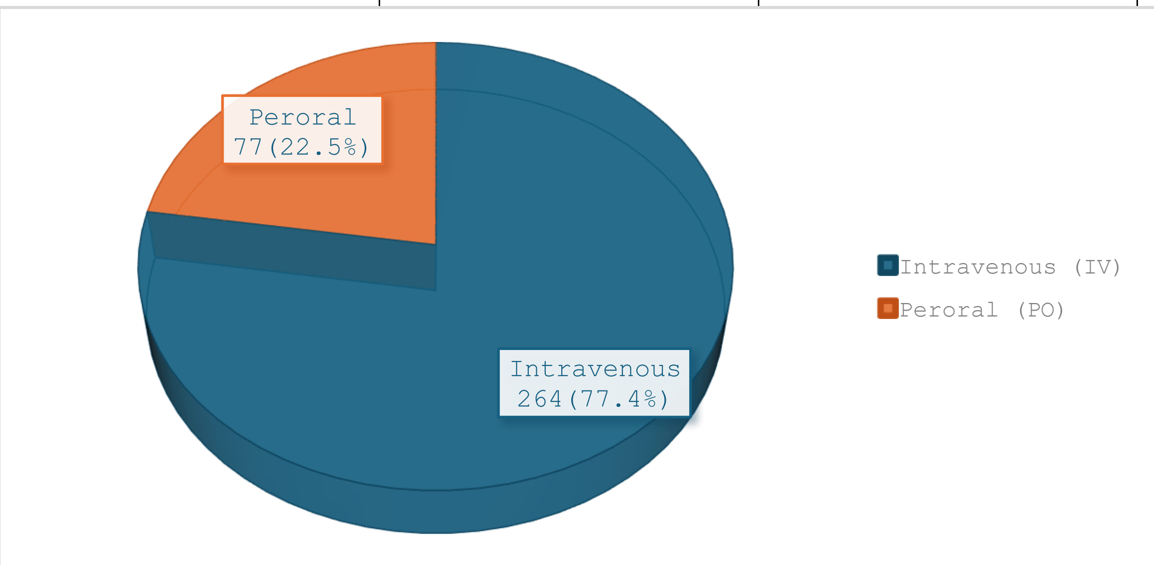
*IV*Intravenous; *PO*peroral; *TID*three times daily; *BD*twice daily

In our research study involving 151 patients, we observed distinct antibiotic dosage regimens. Metronidazole was administered three times daily (TID) at a dose of 100ml in normal saline (NS) or 400mg for both intravenous (IV) and oral (PO) administrations. Following this, Ceftriaxone was administered intravenously at a dose of 1g twice daily (BD), while Amoxicillin-Clavulanic acid was given at doses of 1.25g IV and 625mg PO, also BD. Ceftriaxone-Sulbactam was solely administered intravenously at a dose of 1.5g BD. Cefixime was prescribed orally at a dose of 200mg, Ciprofloxacin was administered either intravenously (100ml in NS) or orally (500mg), and Meropenem was given intravenously at a dose of 1g. Amikacin was administered intravenously at a dose of 500mg, Piperacillin-Tazobactam at a dose of 4.5g IV, and Cefoperazone at a dose of 1g IV. Notably, all antibiotics except Metronidazole were prescribed twice daily.

6. Prescribed route of administration of antibiotics among study polpulation:

Table 12: A comparative analysis of intravenous and oral administration routes of inpatient antibiotics (n=341) prescription

Route	Frequency	Percentage (%)
Intravenous (IV)	264	77.4
Peroral (PO)	77	22.5
Total	341	100



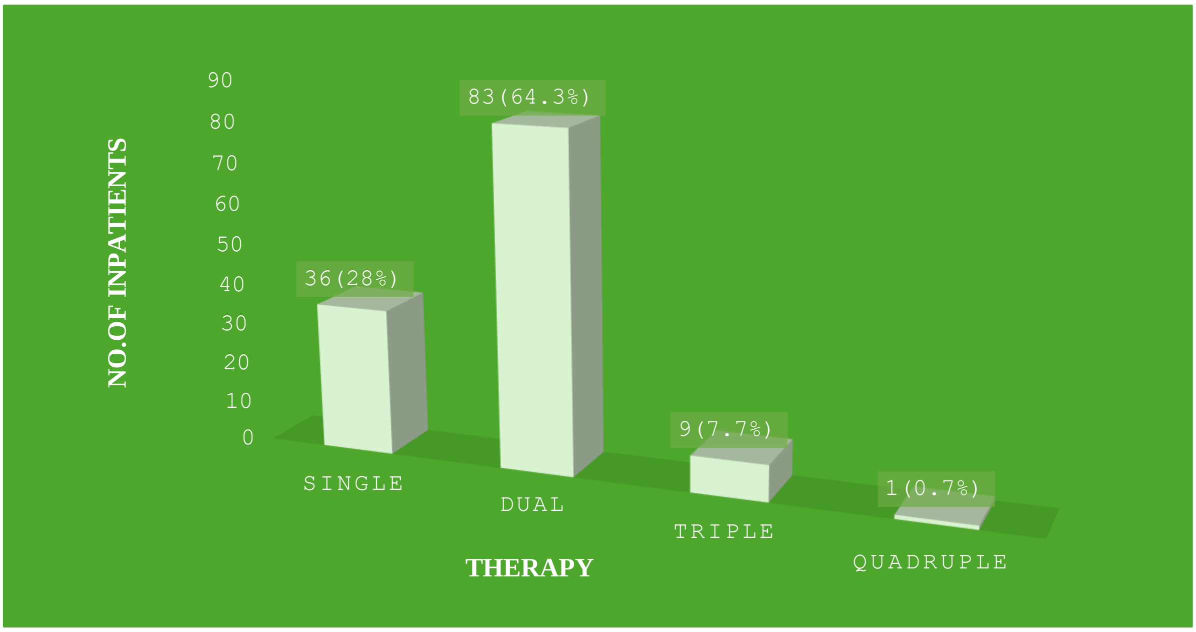
"Figure 6: Distribution of Antibiotic Administration Routes"

According to the findings of our study, out of 341 prescribed antibiotics, 264 (77.4%) were administered intravenously, while the remaining 77 (22.5%) were administered orally.

7. Prescribed single/multiple therapy of antibiotics in the sample population:

Table 13: Analysis of single/multiple therapy approaches in total inpatient antibiotic prescriptions.

Antibiotic therapy	Number of inpatients (n=151)	Percentage
Single	36	28%
Dual	83	64.3%
Triple	9	7%
Quadruple	1	0.7%



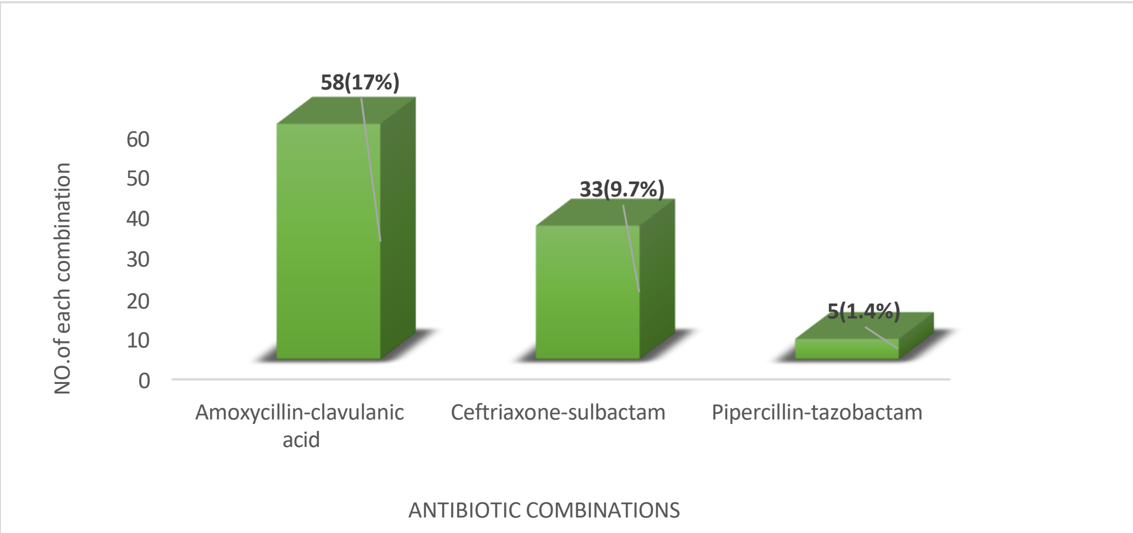
"Figure 7: Prescription Patterns; Single versus Multiple Antibiotic Therapies for Inpatients"

The prescription patterns revealed that 36 (28%) patients received single antibiotic therapy, 83 (64.3%) patients received dual therapy, 9 (7%) patients received triple therapy, and 1 (0.7%) patient received quadruple therapy.

8. Prescribed Antibiotic Combinations Among the Study Population:

Table 14: An investigative analysis into antibiotic combinations

Antibiotic combinations	No. of each Antibiotic Combination prescribed (n=341)	Percentage
Amoxycillin-clavulanic acid	58	17%
Ceftriaxone-sulbactam	33	9.7%
Pipercillin-tazobactam	5	1.4%



"Figure 8: A comprehensive analysis of antibiotic combinations"

Four distinct antimicrobial combinations were employed in the study. The predominant fixed dose combination consisted of Amoxicillin paired with clavulanic acid 58 (17%), with the second most frequent combination being Cefoperazone and sulbactam 33 (9.7%). Additionally, 5 (1.4%) patients received an antipseudomonal antibiotic combination, specifically piperacillin and tazobactam.

9. Adverse drug reactions observed in the inpatients:

9.1 paired t-test statistics

Table 15: Adverse Drug Reaction paired sample statistics.

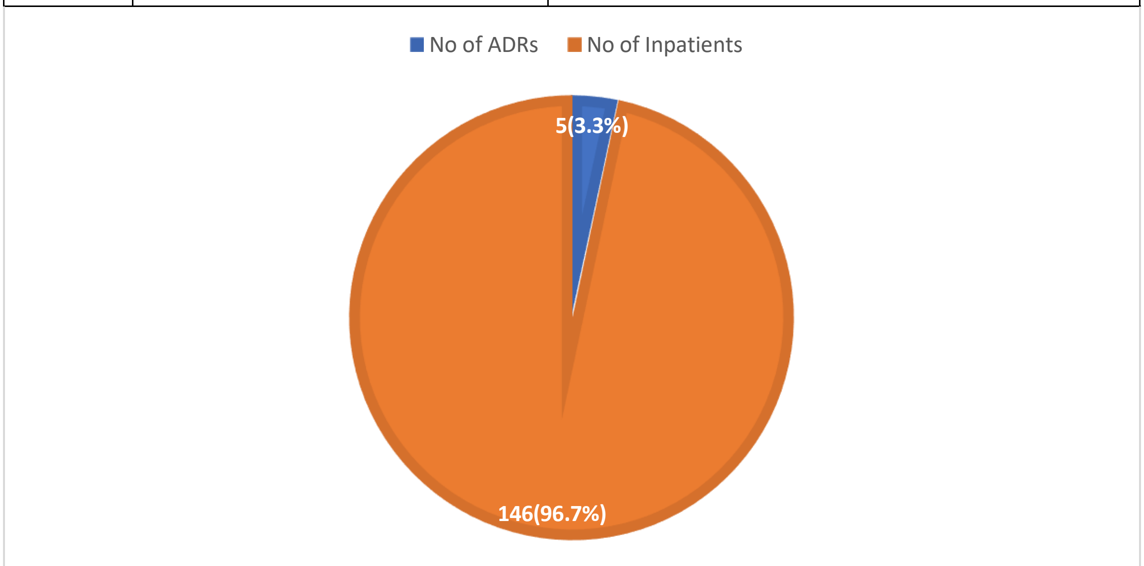
No. of Inpatients (n=151)	No. of ADRs	Mean±S.D	COR	Significance
151	5	0.97±0.180	0.310	<0.001*

*=Significant; *COR*Corelation.

9.2. Identification of adverse drug reactions

Table 16: Detection and documentation of adverse drug reaction during the study

S. No	Drugs	Adverse Drug Reaction
1	Tramadol	Stools not passed
2	Augmentin	Burning sensation, Rash.
3	Amikacin	Swelling of lower limbs
4	Ceftriaxone	Loose stools
5	Metronidazole	Lichenified rashes on both fore arms



"Figure 9: Quantifying Adverse Drug Reactions (ADRs) in the Study"

In the study comprising 151 cases, adverse drug reactions (ADRs) were observed in 5 patients. Notably, 4 of these cases were attributed to antibiotic usage, while the remaining ADR was associated with the use of Tramadol. The research study revealed a positive correlation between variables, with a mean value of 0.87 and a standard deviation of 0.18. This correlation was found to be statistically significant, with a p-value below 0.001.

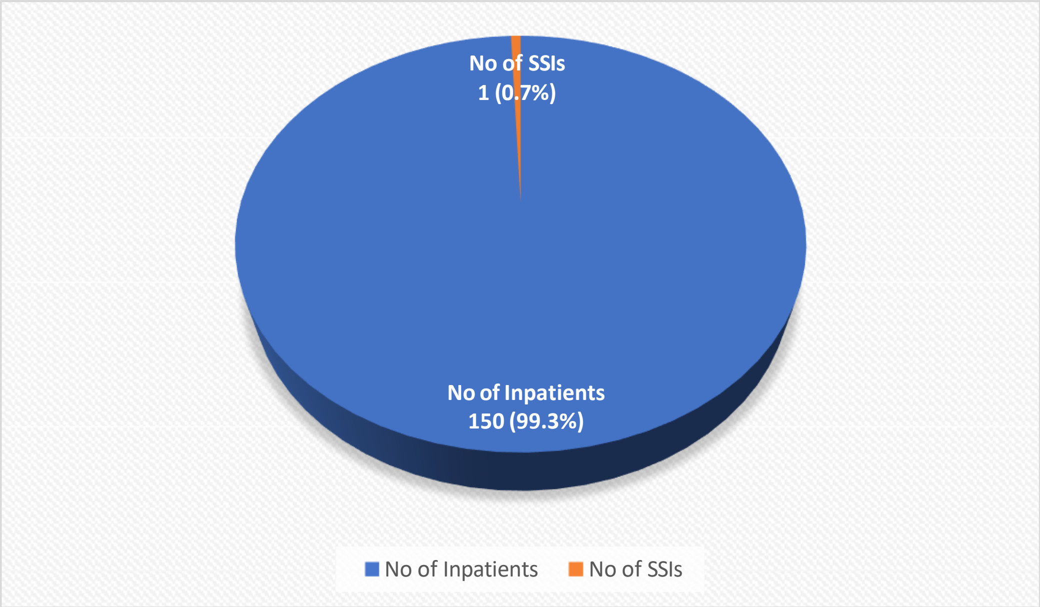
10. One sample t-test statistics:

Table 17: Outcomes of the study

Variables		**Number of Inpatients (n=151)**	**Percentage**	**p- Value**
Outcome 1 (Administration of Narrow spectrum Antibiotics)	Yes No	96 55	63.5% 36.5%	<0.001
Outcome 2 (Discontinuation of Antibiotics within 24 H)	Yes No	30 121	19.9% 80.1%	<0.001
Outcome 3 (Number of Inpatients developed with SSIs)	Yes No	150 1	0.7% 99.3%	<0.001

Outcome 4 (Development of ADRs)	Yes No	5 146	3.3% 96.7%	<0.001*

SSIs Surgical Site Infections; *H* Hours; *ADRs* Adverse Drug Reactions; *=Significant.



"Figure 10: Distribution of Surgical Site Infections (SSIs) among patients"

This data simply resembles the prophylactic use of antibiotics as per ASHP guidelines. Outcome 1 indicates that 96 (63.5%) among 151 patients received narrow spectrum antibiotics according to the guidelines.

Outcome 2 shows that only in 30 among 151 patients discontinued with post operative prophylaxis with in 24h with percentage of 19.9.

Outcome 3 indicates that one patient was developed with SSIs out of 151 inpatients with a percentage of 0.7, this low incidence of SSIs might reason for inappropriate use of prophylactic antibiotics. All the outcomes were statistically significant (p=<0.001).

Discussion

This study affirms to evaluate the utilization of antibiotics in surgical antibiotic prophylaxis. The findings contribute to the ongoing discourse on the positive impact of this preventive measure in postoperative setting. In our study encompassing 151 participants, males were predominant, the ratio diverged from findings by Bhagyashree et,al.,[1] which indicated an equal male to female ratio and found similar by the findings of Kudchadkar et,al.,[8] where male preponderance. Surgical procedures were notably frequent among individuals aged 30–39 with a bracket of 38 (25.8%) followed by age group of 20-29 years with a bracket of 28 (18.5%).

Of the procedures, 24 (15.8%) underwent open appendectomy, 19 (12.5%) hernioplasty, and 16 (10.5%) SSG. This contrasts with Sarvanan et al.,[9] study, where hernia surgeries were most common (20%), followed by cholecystectomy (18.3%) which aligns with a study conducted by Zaheeruddin et al.,[10] shows similar findings of hernia repair (23.8%).

In our study, we observed a notable deviation from the recommended guidelines outlined by the Scottish Intercollegiate Guidelines Network (SIGN) regarding the timing of antibiotic administration in relation to surgical incision. Specifically, we found that antibiotics were administered at least 1 ½ hours prior to surgery, which surpasses the recommended window of no more than 30 minutes before incision. But in our investigation preoperative dosing time was not mentioned properly. This is probably due to high workload at the department.

In our study, the predominant antibiotic prescribed was Metronidazole accounting for 102 (29.9%), diverging from Kudchadkar et al.,[8] findings where third generation cephalosporins, held the highest prevalence at 29%, Rehan et al.,[11].

In the prescription practices observed, 51.6% of cases utilized generic names for antibiotic prescriptions, despite recent guidelines from the Medical Council of India (MCI) advocating exclusive use of generic names, which was in contrast with a study conducted by Kudchadkar et al.,[8] in which 69% drugs were prescribed with generic names.

The average antibiotic prescription per patient stood at 2.2, with approximately 7.7% of patients receiving three or more antibiotics, raising concerns about potential negative consequences, in like Rehan et al.,[11].

While the rationale for using two or more antimicrobials in combination exists, our findings underscore the risks associated with indiscriminate use. Such practices may lead to the emergence of resistant bacteria, super-infections, toxic and allergic reactions, and an increased financial burden on therapy. Notably, antibiotic selection was inappropriate for patients. Surprisingly, none of the patients received Cefazolin, as recommended by American Society of Health-System Pharmacist (ASHP) guidelines[5]. Furthermore, deviations from guidelines were observed, with all hernia repair patients receiving preoperative antibiotics, contrary to recommendations by the Scottish Intercollegiate Guidelines Network (SIGN)[7] and like the study of Rehan et al.,[11]. In addition, our investigation was carried out within a government hospital setting, where most patients underwent empirical therapy rather than receiving treatment based on specific indications.

Optimal surgical prophylaxis necessitates the strategic choice of antibiotics with a narrow antibacterial spectrum. According to the study's findings, Metronidazole, recognized as a narrow-spectrum antibiotic, is extensively employed in 96 (63.5%) among 151 inpatients in adherence to established guidelines as it is a narrow spectrum antibiotic. This approach aims to mitigate the risk of resistance emergence and preserves the efficacy of broad-spectrum antibiotics, which might be essential in the event of the patient developing severe sepsis later. Consequently, it is strongly advised to refrain from utilizing third generation Cephalosporins like Ceftriaxone and Cefpodoxime in surgical prophylaxis protocols. This recommendation aligns with the overarching goal of promoting judicious antibiotic use in surgical settings. These variations highlight the need for increased awareness and adherence to established guidelines to optimize the effectiveness and safety of surgical antibiotic prophylaxis.

Discussing the duration of antimicrobial prophylaxis, our results echo established guidelines, suggesting a single antibiotic dose suffices for operations lasting 4 hours or less. However, extended surgeries may necessitate additional doses, aligning with existing recommendations. Contrary to concerns, our study aligns with larger investigations, emphasizing that a single-dose antibiotic prophylaxis does not exhibit an elevated SSI risk when compared to multi-dose regimens. This underscores the efficacy and feasibility of streamlined prophylactic approaches in certain surgical scenarios.

In our investigation, antibiotics were discontinued within the initial 24 hours only for a subset of patients (30), signalling a departure from the standard practice of prolonged antibiotic courses post-surgery. Notably, the incidence of Surgical Site Infections (SSI) remained remarkably low at 0.7% with statistical significance of $p<0.001$, aligning with Parulekar et al.,

[12] observations. This low SSI rate could be attributed to the universal administration of prophylactic antibiotics to all 151 patients, regardless of appropriateness.

In majority of patients post-operative antibiotics were administered for an average duration of 5.1 days within the hospital setting, for surpassing recommended timelines. This extended regimen mirrors findings in a Taiwanese[13] study and a study by Kudchadkar et al.,[8] and Rehan et al. in India, where a similar duration of 6 and 6.2 days was reported respectively. Notably, prolonged antibiotic use beyond the recommended period can elevate toxicity and escalate treatment costs without yielding additional benefits. This underscores the importance of aligning antibiotic duration with established guidelines to optimize patient outcomes and resource utilization.

In our investigation, we identified and documented five adverse drug reactions (ADRs). Among these, four were attributed to antibiotic usage. Notably, hypersensitivity induced by Amoxicillin-Clavulanic acid, lower limb swelling caused by Amikacin, Lichenified rashes (hypersensitivity) caused by Metronidazole and loose stools induced by ceftriaxone were observed. The possible effects may be due to physiology of inpatients. According to a study Geer et al.,[14] the prevalence of reported antibiotic associated ADRs were 40.9%.

Additionally, Tramadol was associated with constipation with a significance of $p<0.001$, COR-0.310, diverging from the findings of Ducrotte et al.,[15] in which the overall prevalence of constipation among opioid users was 441 (8.7%) out of 4753 opioid users.

Limitations of our study

The limitations of the present study include a relatively small sample size of 151 participants and a duration of only 6 months, potentially limiting the generalizability of findings to the broader population. Additionally, the scarcity of studies on this subject in this geographical area restricts the scope for comprehensive result comparisons, underscoring the need for further research to validate and extend these findings.

Conclusion

This study highlighted the overuse of antibiotics in surgical antimicrobial prophylaxis, revealing discrepancies with the recommendations outlined by the American Society of Health-System Pharmacists (ASHP) and the Scottish Intercollegiate Guidelines Network (SIGN). Inappropriate utilization of antibiotics was noted, particularly in terms of the selection, timing, and duration of antibiotic administration, which deviated from the guidelines provided by ASHP. These findings suggest a need for closer adherence to established guidelines to optimize patient outcomes and minimize the risks associated with antibiotic overuse. Due to the escalating global concern of antimicrobial resistance, there is an imperative need for auditing antimicrobial usage in surgical prophylaxis. The present study, despite antibiotic use, revealed one case of Surgical Site Infections (SSIs). The study also emphasizes the importance of locally developed guidelines, which are more likely to be embraced and adhered to compared to nationally formulated ones. The establishment of such guidelines is imperative to curb the emergence of resistant pathogens, promote cost-effective antibiotic use, and prevent hospital-acquired infections.

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