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General Surgery

COMPARATIVE STUDY OF PERIOPERATIVE ANTIBIOTICS VERSUS 7-DAYS POST-OPERATIVE ANTIBIOTIC COVERAGE IN ELECTIVE SURGICAL CASES

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ABSTRACT Antibiotic prophylaxis in surgery is crucial to prevent surgical site infections (SSIs). However, the optimal duration of antibiotic therapy remains controversial. This study compares perioperative single-dose antibiotic prophylaxis with extended 7-day post-operative antibiotic coverage in elective surgical procedures.

KEYWORDS : Perioperative Antibiotics, Post Operative Antibiotics, Outcome

INTRODUCTION

Surgical site infections are among the most common complications following surgery, accounting for increased morbidity, hospital stay, and healthcare costs. Appropriate perioperative antibiotic prophylaxis has been shown to significantly reduce the incidence of SSIs. However, the practice of extending antibiotic coverage post-operatively for several days persists in some settings, despite limited evidence supporting its efficacy.

The aim a) To assess the efficacy and advantages of perioperative antibiotics vs post operative antibiotics
b) To study cost efficacy of both regimens

METHODOLOGY

Patients And Methods:

Patient admitted in Asram medical college,eluru,Andhra Pradesh from 2024- 2025

Calculated Sample Size: 100 (all are Clean elective surgeries)

Study Group:

All the clean class I cases in the study group were given a single dose of 1gm of inj. Ceftriaxone given 1hour before surgery and the second dose was given within 12 hours after surgery if surgery was prolonged for more than 2hours. They received no further antibiotics i.v or oral.

Control Group:

All the cases in the control group received inj. Ceftriaxone 1gm iv BD for 3 days followed by oral cefixime 200mg BD for 4 days. The incidence of SSI was noted and analysed.

Inclusion Criteria:

- All elective clean cases posted for surgery
- Both genders of age 18-60
- Surgeries requiring a short hospital stay

Exclusion Criteria :

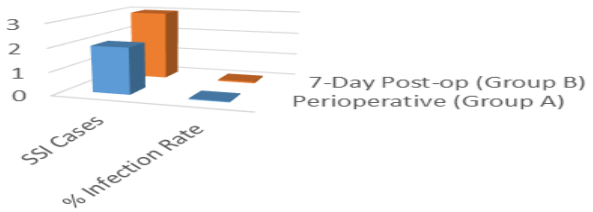
- Emergency surgeries
- Prolonged hospital stay
- <18 yrs & >60yrs
- Pregnant / Lactating women
- Hepatic, renal, cardiovascular diseases, immuno-suppression

OBSERVATIONS AND RESULTS

1. Incidence of Surgical Site Infection (SSI)

Group	SSI Cases	% Infection Rate
Perioperative (Group A)	2	4%
7-Day Post-op (Group B)	3	6%

Observation: Slightly higher SSI in perioperative-only group, but not statistically significant.



2. Duration of Hospital Stay (Mean ± SD)GroupHospital Stay (days)

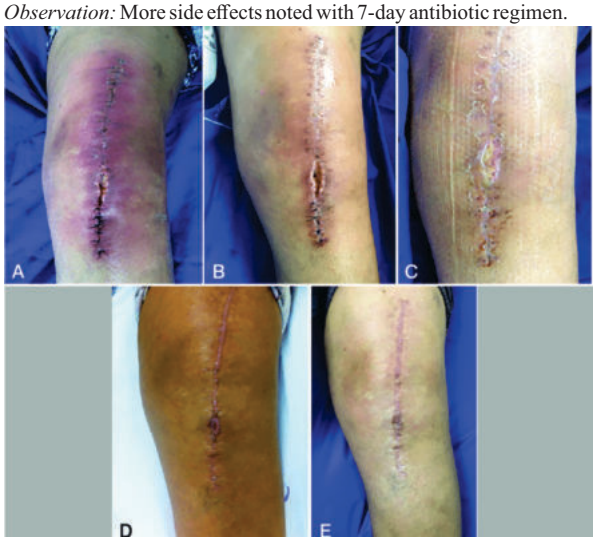
Group	Hospital Stay (days)
Group A	4.2 ± 1.1
Group B	5.6 ± 1.5

Observation: Longer hospital stay in patients receiving prolonged antibiotics.

3. Antibiotic-Related Side Effects

Group	Nausea	Diarrhea	Allergic Reaction
Group A	1	0	0
Group B	4	3	2

Observation: More side effects noted with 7-day antibiotic regimen.



PERIOPERATIVE SURGICAL WOUND

POST OPERATIVE ANTIBIOTICS WOUND

DISCUSSION

Nosocomial infections continue to be a major source of morbidity and mortality throughout the world.

The use of prophylactic antibiotic in all surgical cases are advocated ever since, the concept of the use of antibiotic preoperatively to curtain

and prevent wound infection was postulated by Bernard and Cole in 1964 [24]

In 2001, Chambers et al[26] in their study recommended that first-generation cephalosporin antibiotic the cefazolin are drugs of choice for the use of prophylactic antibiotics for the general surgical prophylaxis than the second or third-generation cephalosporin.

Older patients, as well as those with underlying conditions like diabetes or anemia, are more prone to SSIs. Proper preoperative evaluation and correction of these conditions are crucial to minimizing infection risk.

The use of a single-dose perioperative antibiotic has several advantages over prolonged postoperative coverage. It reduces the cost burden on the patient, decreases the risk of side effects, and limits the emergence of resistant organisms. Prolonged antibiotic use, on the other hand, contributes to unnecessary drug exposure and antimicrobial resistance without offering significant additional protection in clean surgical cases.

Antibiotic and Timing of Antibiotic Prophylaxis

In the present study the use of third generation cephalosporin, single dose of IV ceftriaxone 1 gm is justified and having a prolonged half-life up to 8 to12 hours which will take care of the wound in its initial crucial phase. It was administered half an hour to 1hour before the incision under aseptic precaution to all the patients in study group and 4 patients (8%) in this group got infected when compared to the control group where no such antibiotic was given and there was an incidence of infection in 4 patients (8%).

Cost Of The Antibiotic

Antimicrobials were overprescribed in developing countries (in our country) with respect to the developed countries where approximately 1/3rd of health budget is wasted on antibiotics. Postoperative prophylaxis poses extensive burden on hospital expenses in these countries. lesser courses of perioperative antimicrobials minimize cost, drug toxicity and inception of drug tolerance in the long run

In our study,. Average cost of antibiotics was increasing as doses of antibiotics increases from single to multiple. It was highest among patients on multiple doses antibiotics & lowest among single dose antibiotic. It was about Rs.700 per patient without SSI to 1100 per patient with SSI among multiple dose patients. Among single dose patients the average cost ranges from Rs.100 per patient without SSI to Rs.500 per patient with SSI. There was statistically significant difference in cost of antibiotics in both groups. (P value=0.0001).

This study demonstrates that a single-dose perioperative antibiotic strategy is as effective as a 7-day post-operative antibiotic regimen in preventing SSIs for elective surgeries. Extended antibiotic use did not reduce infection rates but significantly increased adverse events and treatment costs.

Prolonged antibiotic use promotes antimicrobial resistance and exposes patients to unnecessary risks, including gastrointestinal disturbances and antibiotic-associated colitis.

Our findings align with current CDC and WHO recommendations advocating minimal antibiotic exposure without compromising surgical outcomes.

CDC classification

SURGICAL WOUND CLASSIFICATION

Class I/Clean: A non infected surgical wound in which no inflammation is identified without involving the respiratory, gastrointestinal or genito urinary tract . In addition, clean wounds are closed primarily. Operative incisional wounds that follow non-penetrating trauma (blunt) should be placed in this category if the criteria is met**.**

Class II/Clean-Contaminated: An operative wound in which the respiratory, alimentary, genital or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

Class III/Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, non-purulent inflammation is encountered are included in this category.

Class IV/Dirty-Infected: Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation

CONCLUSION

This study highlights a crucial aspect of general surgery—the use of perioperative antibiotics in clean elective procedures and 7 days use of antibiotics postoperatively. The findings lead to several important conclusions:

- Surgical site infections (SSIs) are significant complications that can result in increased patient morbidity and extended hospital stays. Such prolonged cases may strain hospital resources, contribute to the development of antibiotic-resistant bacteria, and, in severe instances, lead to sepsis and patient death. SSI rates tend to rise with advancing age, with elderly patients being particularly vulnerable. Recognizing and addressing risk factors—such as anemia and diabetes—prior to surgery is essential. Surgeons should also consider local and microbial factors to minimize infection risk.

- Upon diagnosing an SSI, wound or pus samples should be collected for culture and sensitivity testing. Antibiotic therapy should then be guided by the identified organism's sensitivity. In more severe infections, adequate drainage should be ensured, potentially by releasing one or more sutures, followed by secondary closure once the infection is under control. The incidence of SSIs linked to hospital-acquired infections can be minimized through proper nursing care and well-maintained surgical wards.

- Prophylactic administration of third-generation cephalosporins is recommended for patients with multiple unavoidable risk factors. When feasible, closed suction drains should be preferred over open drains. Additionally, the duration of surgery should not exceed the 70th percentile of standard time for the specific procedure to reduce SSI risk.

- Overuse and misuse of antibiotics should be avoided, as they increase treatment costs, promote antibiotic resistance, and raise the likelihood of adverse effects.

- The study concludes that a single perioperative dose of antibiotics is as effective as extended postoperative antibiotic use in clean elective surgeries, assuming all risk factors are addressed.

- Furthermore, reducing antibiotic doses can lower patient costs and help prevent the emergence of resistant strains.

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