

**ORIGINAL RESEARCH**

# Assessment of single-dose antibiotic versus conventional 5 days antibiotic in clean surgery

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Received: 27 November, 2023

Accepted: 25 December, 2023

**ABSTRACT**

**Background:** A surgical site infection (SSI) is an infection that appears at or near the site of the surgical incision. The present study was conducted to compare single-dose antibiotic versus conventional 5 days antibiotic in clean surgery. **Materials & Methods:** The study was conducted in department of general surgery at ANNMCH, Gaya, Bihar during November 2021 to May 2022. 60 cases of both genders were divided into 2 groups. Group I, the antibiotic dose was given an hour prior to the surgery intravenously. In Group II, the first dose was given after the surgery for five days, wherein two days it was given intravenously and for the next three days oral tablets were given (Cefixime 200 mg bd). Incidence of SSI was recorded. **Results:** Group I had 14 males and 16 females and group II had 13 males and 17 females. Types of surgery was lap appendectomy in 15 and 13, lap cholecystectomy in 10 and 8, hernioplasty in 4 and 6 and breast lump (benign) in 1 and 3 in group I and II respectively. Fever was present in 6 and 8, redness was present in 7 and 9, swelling was present in 5 and 8, wound discharge was present in 5 and 6 and surgical site infection was present in 4 and 5 patients in group I and II respectively. The difference was non-significant ( $P > 0.05$ ). **Conclusion:** Single-dose antibiotic prophylaxis is a sufficient procedure for clean-contaminated surgeries.

**Keywords:** appendectomy, surgical site infection, Swelling

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**INTRODUCTION**

A surgical site infection (SSI) is an infection that appears at or near the site of the surgical incision. It typically occurs within a month of the procedure, or a year if an implant has been left in the site.<sup>1</sup> SSI is a major complication of surgical technique and is a commonly occurring nosocomial infection. The main components of antimicrobial prophylaxis include the selection of patients and medications, timings, costs, and duration. Failure to comply with these accepted preventive standards may result in a decrease in the incidence of these infections.<sup>2</sup> Ideally, a preventive agent should be administered within 30 minutes of the surgical incision. The main goal is to increase the concentration of antibiotics in body tissues as a preventive precaution, even though there is no set time for administering antibiotics to the patient. This allows for correct incision care to be conducted during the surgery or its initiation.<sup>3</sup>

Surgical Antibiotic Prophylaxis (SAP) is a brief course of antibiotics administered carefully prior to the initiation of surgical procedures in order to reduce the incidence of surgical site infections (SSIs). The

general recommendation is to administer an antibiotic that covers all major body parts and concurrently address all potential infections.<sup>4</sup> Additionally, various variables related to antibiotics, such as side effects during administration, adverse effects on the patient, antibiotic profile, activities against bacteria, resistance patterns, costs, etc., should also be considered. By using these variables in the process of selecting antibiotics, SSIs can be prevented.<sup>5</sup> The present study was conducted to compare single-dose antibiotic versus conventional 5 days antibiotic in clean surgery.

**MATERIALS & METHODS**

The study was conducted in department of general surgery at ANNMCH, Gaya, Bihar during November 2021 to May 2022. The present study was conducted on 60 cases of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I, the antibiotic dose was given an hour prior to the surgery intravenously. In Group II, the first dose was given

after the surgery for five days, wherein two days it was given intravenously and for the next three days oral tablets were given (Cefixime 200 mg bd).

Incidence of SSI was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I	Group II
M:F	14:16	13:17

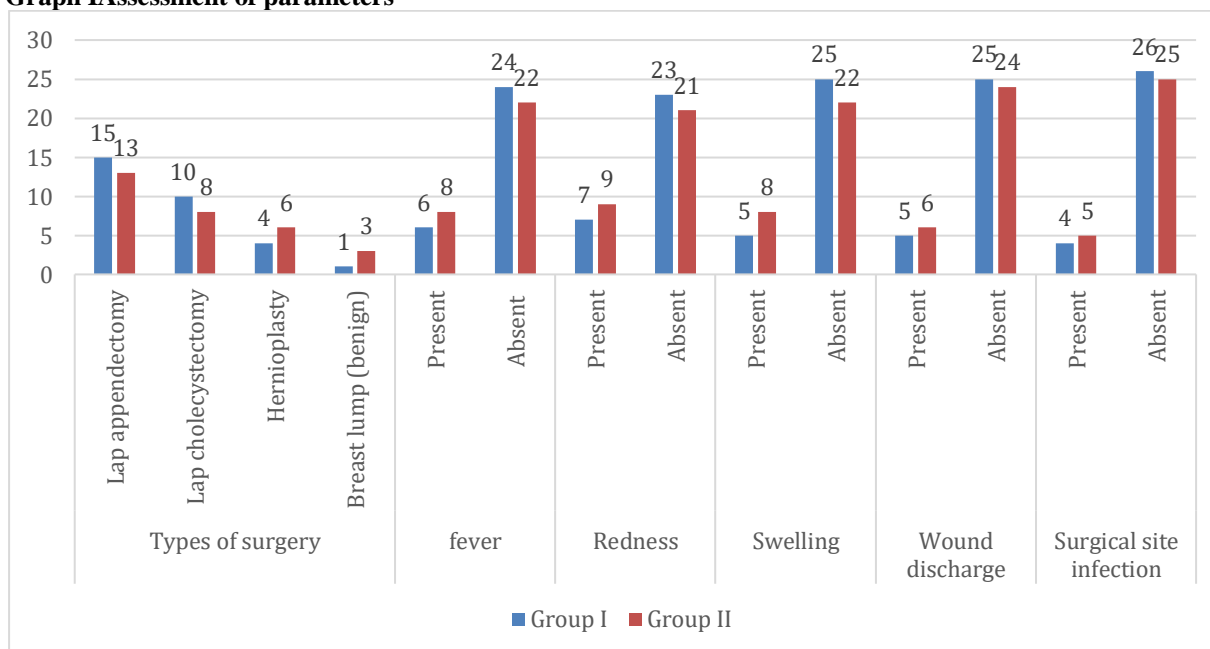
Table I shows that group I had 14 males and 16 females and group II had 13 males and 17 females.

**Table II Assessment of parameters**

Parameters	Variables	Group I	Group II	P value
Types of surgery	Lap appendectomy	15	13	0.25
	Lap cholecystectomy	10	8	
	Hernioplasty	4	6	
	Breast lump (benign)	1	3	
Fever	Present	6	8	0.64
	Absent	24	22	
Redness	Present	7	9	0.86
	Absent	23	21	
Swelling	Present	5	8	0.91
	Absent	25	22	
Wound discharge	Present	5	6	0.88
	Absent	25	24	
Surgical site infection	Present	4	5	0.72
	Absent	26	25	

Table II shows that types of surgery was lap appendectomy in 15 and 13, lap cholecystectomy in 10 and 8, hernioplasty in 4 and 6 and breast lump (benign) in 1 and 3 in group I and II respectively. Fever was present in 6 and 8, redness was present in 7 and 9, swelling was present in 5 and 8, wound discharge was present in 5 and 6 and surgical site infection was present in 4 and 5 patients in group I and II respectively. The difference was non-significant (P>0.05).

**Graph I Assessment of parameters**



**DISCUSSION**

When it comes to healthcare expenses, mortality, and morbidity, SSI assigns a significant weight. In addition to these, further complications include

increased pain and the need to treat a cut to prevent sepsis or even death.<sup>6</sup> When patients lose their source of income while in the hospital, the negative impacts of severe sepsis are exacerbated. Even in clean cases,

antibiotics are given for a period of 7–10 days to prevent wound infections.<sup>7,8</sup> Not only is this expensive, but it also encourages resistance to both that particular antibiotic and others. Systemic antibiotics have been shown in numerous clinical preliminary studies to be effective when used during, prior to, or following surgery.<sup>9,10</sup> The present study was conducted to compare single-dose antibiotic versus conventional 5 days antibiotic in clean surgery. We found that group I had 14 males and 16 females and group II had 13 males and 17 females. Faiz Alam et al<sup>11</sup> in their study two groups were created. Patients with even numbers (Group-A) were taken for three dose preliminaries, and those with odd numbers (Group B) were taken for five days course of antibiotic treatment. Clean procedures were incorporated. The postoperative assessment was a finished improvement of fever or wound infection. The mean age was 35.51+/- 20.79 years in group A and 26.17+/- 19.79 years in group B. In any case, there was a fundamentally higher extent of male patients in group B than in group A (p=0.006). Measurable examination showed no critical distinction in the extent of early postoperative infection cases between the two groups (p=0.270). Staphylococcus aureus was the commonest life form refined from the injury release in our review followed by E. coli. Five of our cases having postoperative injury infection showed development in three cases, out of which 3 were shallow and 2 were profound. There was no huge contrast between the two groups in regards to terms of stay in the clinic.

We found that types of surgery was lap appendectomy in 15 and 13, lap cholecystectomy in 10 and 8, hernioplasty in 4 and 6 and breast lump (benign) in 1 and 3 in group I and II respectively. Fever was present in 6 and 8, redness was present in 7 and 9, swelling was present in 5 and 8, wound discharge was present in 5 and 6 and surgical site infection was present in 4 and 5 patients in group I and II respectively. Ali et al<sup>12</sup> compared the proportion of early postoperative infection in clean orthopedic surgery after single dose of prophylactic antibiotic and multiple doses of prophylactic antibiotic. Two hundred patients of either age and gender, undergoing clean orthopedic surgery were equally divided into two groups A and B. Group A was given single dose of prophylactic antibiotic, while group B was given multiple doses of prophylactic antibiotic. Mean age was 35.51+/-20.79 years in group A and 26.17+/-19.79 years in group B. However, there was a significantly higher proportion of male patients in group B than in group A (p=0.006). Statistical analysis showed no significant difference in the proportion of early postoperative infection cases between the two groups(p=0.270). Staphylococcus aureus was the commonest organism cultured from the wound discharge in our study followed by E. coli. Eight of our cases having postoperative wound infection showed no growth, out

of which 7 were superficial and 1 was deep. There was no significant difference between the two groups regarding mean operating time and duration of stay in hospital.

The shortcoming of the study is small sample size.

## CONCLUSION

Authors found that single-dose antibiotic prophylaxis is a sufficient procedure for clean-contaminated surgeries.

## REFERENCES

1. Subramaniyan S G et al, A prospective study of single dose preoperative antibiotic cover in clean elective surgical cases- a single center study. *Int Surg J.* 2021 Jan;8(1):165- 169.
2. Mathur P, Trikha V, Farooque K, Sharma V, Jain N, Bhardwaj N, et al. Implementation of a short course of prophylactic antibiotic treatment for prevention of postoperative infections in clean orthopaedic surgeries. *Indian J Med Res.* 2013;137(1):111-6.
3. Madhu BS, Kumar SHB, Reddy NKM, Reddy AV, Kalabhairav S. Effect of single dose pre-operative antibiotic prophylaxis versus conventional antibiotic therapy in patients undergoing lichtenstein tension free mesh repair. *Int Surg J.* 2017;4:738-42.
4. Rayamajhi B, Basukala S. A comparative study following single-dose versus three-dose perioperative antimicrobial prophylaxis in clean elective surgical cases. *Innov J Med Health Sci.* 2015;5(2):42-5.
5. Aufenacker TJ, Van Geldere D, Van Mesdag T, Bossers AN, Dekker B, Scheijde E, et al. The role of antibiotic prophylaxis in prevention of wound infection after Lichtenstein open mesh repair of primary inguinal hernia: a multi-center double-blind randomized controlled trial. *Ann Surg.* 2004;240(6):955.
6. Ahn BK, Lee KH. Single-dose antibiotic prophylaxis is effective enough in colorectal surgery, *ANZ J Surg.* 2013 Sep;83(9):641- 5.
7. Mehrabi Bahar M, Jabbari Nooghabi M, Jangjoo A, The role of prophylactic cefazolin in the prevention of infection after various types of abdominal wall hernia repair with mesh, *Asian J Surg.* 2015 Jul;38(3):139-44.
8. Thejeswi PC, Shenoy D, Tauro LF, Ram SH. Comparative study of one-day perioperative antibiotic prophylaxis versus seven-day postoperative antibiotic coverage in elective surgical cases. *Internet J Surg.* 2012;28(2).
9. Mangram AJ, Horan TC, Pearson ML, et al. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol.* 1999;20(4):250-278.
10. Weber WP, Marti WR, Zwahlen M, Misteli H, Rosenthal R, Reck S et al. The timing of surgical antimicrobial prophylaxis. *Ann Surg*2008;247:918-26.
11. Faaiz Alam, Kanchan Sonelal Baitha, Prem Prakash, Nadeem Ahmad. Comparative study of the role of single-dose Antibiotic versus conventional 5 Days Antibiotic in clean surgery. *International Journal of Health and Clinical Research.* 2022;5(1):360-364.
12. Ali M, Raza A. Role of single dose antibiotic prophylaxis in clean orthopedic surgery, *JCPSP.* Feb2006, 16 (1):45-8.