

Incidence of Surgical Site Infections in Elective Abdominal Surgery

Dibin Mohammed B¹, Abhijith Shetty², M S Moosabba³

Abstract: **Aim:** To evaluate the incidence of Surgical Site Infection (SSI) and to study the different causative factors for SSI in elective abdominal surgery. **Materials and methods:** This is a prospective study conducted in Department of General Surgery in Yenepoya Medical College Hospital Mangalore. All patients above 14 yrs admitted for elective abdominal surgery for various causes were included and patients with pre-existing infection were excluded. Injection Ceftriaxone 1 gram and Metronidazole 500milligram were given intravenous to all patients one hour before surgery and continued in post operative period. The surgical site was inspected daily for erythema, swelling, induration, local rise of temperature, pain and septic discharge and increase in body temperature from 48 hrs after surgery to eight post operative day. **Results:** Incidence of surgical site infection in elective abdominal surgery was found to be 16% in our study which compares favourably with studies of Raka L et al and Razavi SM et al. The most common organism causing wound infection was *Escherichia coli*. **Conclusion:** The study shows that the incidence of SSI is similar to other studies; but there is a scope for improvement by paying more attention on to a few of the predisposing factors.

Keywords: SSI, elective surgery

1. Introduction

- 1) Infections in the post operative wounds continues to be one of the serious complications from olden times.
- 2) In the pre Lister era, most operative wounds became infected, leading to a feeling of helplessness among surgeons in dealing with wound infection.
- 3) The application of the principles of antisepsis as developed by Lister and Pasteur, lead to the prevention of post operative infections in clean surgical wounds.
- 4) Advancement in the field of asepsis and antiseptic techniques, surgical technique, newer antibiotics and modern suture materials, surgical site infection is still a threat to the surgical world. Another dilemma faced by the surgeons is the proper choice of antibiotics.
- 5) The indiscriminate use of antibiotics has led to the development of antimicrobial resistance.
- 6) Clear understanding of the pathogens and their pathogenicity with judicious selection of antibiotics will help the surgeon in not only tackling this problem, but will also turn out to be cost effective in long run.
- 7) Despite all the advancements, surgical site infection continues to be a serious problem.
- 8) The higher rates of surgical site infection are associated not only with a higher morbidity and mortality but also with increased costs of medicare.
- 9) Hence a constant awareness of the ever present threat of infection must be a way of life for the entire surgical fraternity.

2. Aims

- To evaluate the incidence of surgical site infection in elective abdominal surgery (HERNIOPLASTY).
- To enumerate the different causal factors for SSI in elective abdominal surgery in our hospital set up.

3. Materials and Methods

- This is a prospective study which was conducted in the Department of Surgery,

- YENEPOYA MEDICAL COLLEGE Mangalore from JUNE 2014 to June 2016.
- A total of 100 patients who underwent elective abdominal surgeries were included in the study.
- The aim of the study is to evaluate the incidence of Surgical Site Infection in elective abdominal surgery and to enumerate the different causal factors for SSI in elective abdominal surgery in our hospital set up.

Inclusion criteria

All the patients above 14 years admitted for elective abdominal surgery(HERNIOPLASTY) for were included.

Exclusion criteria

Patients presenting with preexisting infections were excluded

Patient Selection

All the patients above 14 years admitted for elective abdominal surgery for hernia, with no pre-existing infection. Patients were informed about the study in their vernacular language and an informed consent was obtained.

Antibiotic selection

Third generation Cephalosporin – Ceftriaxone was used for all the patients.

Pre operative preparation

Shaving of the operative area was done the night before surgery. All patients were adviced to take shower on the day of surgery with soap. All patients received Injection Ceftriaxone 1 gram intravenous one hour before the incision.

Aseptic precautions in the operation theatre

All routine aseptic precautions were taken like using autoclaved gowns, drapes, sterile gloves and instruments. Standard surgical scrub was done for 6 minutes before performing the operation

Operative

The operation area was painted with 5% povidine iodine. The principles of surgery were followed in all cases such as

minimum tissue handling and maintenance of adequate haemostasis. Skin closure done with skin staples. Neosporin ointment was used for local application and wound covered with adhesive dressing. All surgeries were done under spinal anaesthesia.

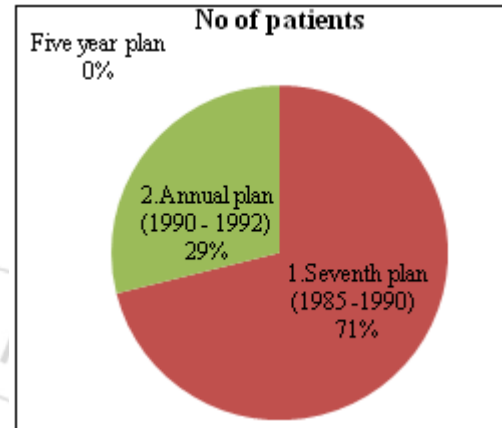
Post operative care

- Injection Ceftriaxone were given 1 dose in the post operative period.
- The wound was inspected for any evidence of infection starting from 48hrs post surgery day till 8th post operative day.
- Patients were followed up till discharge.
- The criteria for SSI was based on CDC's definition of SSI.
- For the patient who satisfied any of the criteria for SSI, wound swab was sent to the clinical microbiology laboratory for Gram stain and routine culture methods.
- No culture was obtained for anaerobes, viruses or fungi.
- The patients were studied only for superficial incisional SSI.
- The Chi square (X²) test and Mann Whitney 'U' test were used to analyse the data.
- Data was collected for patient demographics, clinical information, underlying disease, surgical procedures, antimicrobials used, infecting pathogens and their antimicrobial susceptibility patterns and evidence of SSI.
- The standardized set of criteria developed by CDC National Nosocomial Infection. Surveillance System for Superficial incisional SSI was used.

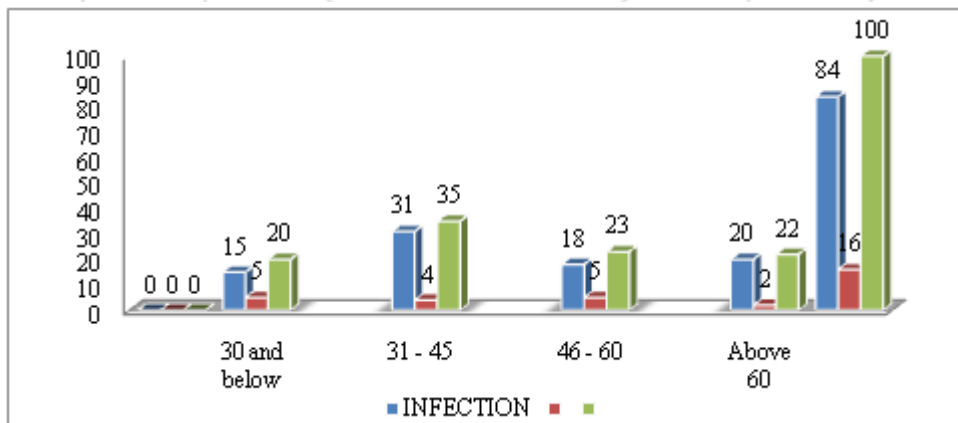
4. Results

Total of 100 patients were enrolled for this study, out of which 16 patients were found to have SSI. The overall incidence in our study was 8%.

	No of patients	Percentage
Present	16	16%
Absent	84	84%
Total	100	100%

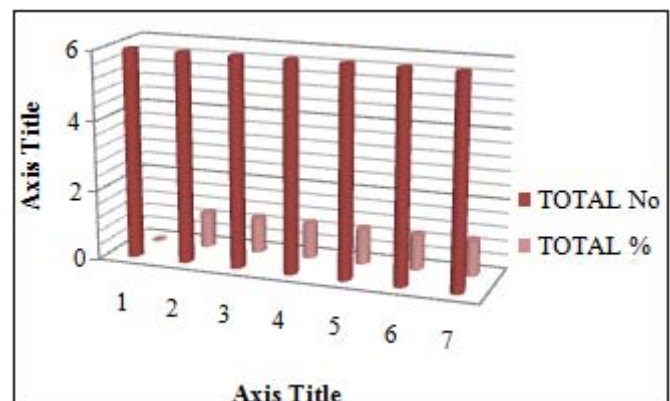


	Infection		Total
	Absent	Present	
30 and below	15	5	20
31 - 45	31	4	35
46 - 60	18	5	23
Above 60	20	2	22
	84	16	100



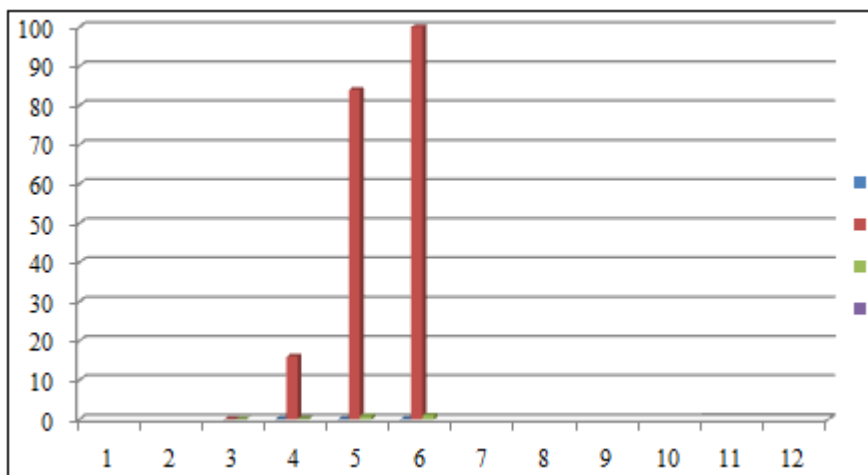
Incidence in relation to time of occurrence of infection

	Time of No	Occurrence %	Total No	%
After 48 Hrs	0	0.00	6	0%
3rd day	1	16.6	6	100%
4th day	3	50	6	100%
5th day	4	66.6	6	100%
6th day	3	50	6	100%
7th day	3	50	6	100%
8th day	1	16.6	6	100%



Incidence in relation to microorganisms isolated

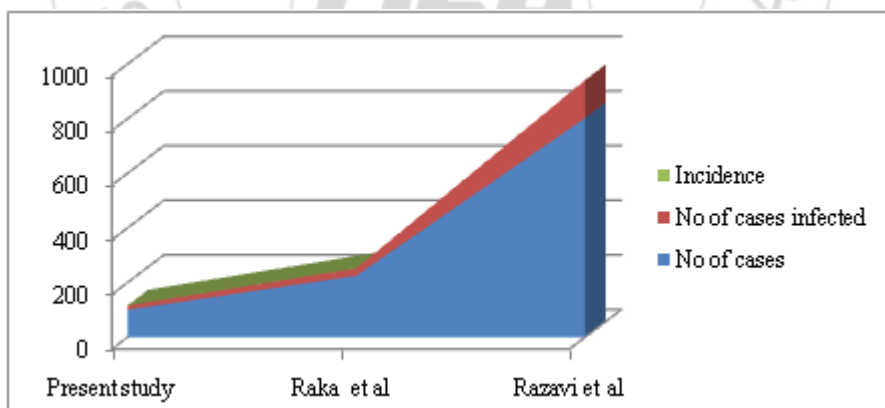
Infection		No of Patients	Percentage
Absent		6	
Present	β -haemolytic streptococcus	2	16.7
	Staphylococcus	2	16.7
	Coagulation –ve staphylococcus	1	
	Escherichia coli	2	8.3
	Enterococcus	1	16.7
	Klebsiella	1	8.3
	Pseudomonas	2	8.3
	TOTAL	11	



5. Discussion

The overall incidence of SSI in our study is 8% which compares favourably with studies of Raka et al (12%) and Razavi et al (17.4%).

	Present study	Raka et al	Razavi et al
No of cases	100	225	802
No of cases infected	16	27	139
Incidence	11.5%	12%	17.4%



Of the 100 patients in this study, SSI was noted in 16 patients (16%). This incidence is much higher than those reported in Western literature such as United Kingdom (3.1%), Holland (4.3%), etc.36,37,38

Staphylococcus, which is similar to organism profiles described in other studies.

Studying the age related incidence of SSI, we found the highest incidence of 34.6% in 30-45 years age group, the above 60 yrs age group being the next largest incidence group, but overall incidence in each age group did not significantly differ. Hence, age was not much of a influencing factor in our study. Study of the bacteriological profile, shows most of the cases had single organism infection, the commonest organism isolated being Escherichia coli followed by Pseudomonas and

6. Conclusion

- 1) This study shows that the incidence of SSI is high in our hospital, compared to European countries.
- 2) This study did not show any statistically significant correlation between age
- 3) The incidence of infection by Gram –ve bacteria was higher than that of Gram +ve bacteria
- 4) Antimicrobial use is widespread and inconsistent with published guidelines

- 5) The actual incidence of SSI could be significantly higher than that showed by the study as the patients were only followed up to the day of discharge.

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Authors Profile

Dr Dibin Mohammed B is Postgraduate, Department of General Surgery, Yenepoya Medical College

Dr Abhijith Shetty is Assistant Professor, Department Of General Surgery, Yenepoya Medical College

Dr M S Moosabba, Professor and HOD, Department Of General Surgery, Yenepoya Medical College

