

Incidence of Surgical Site Infections Among Patients Admitted to a Tertiary Care Hospital

Surinder Kumar Garg

Assistant Professor, Department of General Surgery,
Pandit Jawaharlal Nehru Government Medical College, Chamba, HP, India.

ABSTRACT

Background: Surgical site infection (SSI) is a hospital acquired infection (HAI) that arises following surgery and occurs within 30 days of an operation, or within one year, if an implant is used. The present study was conducted for assessing the incidence of surgical site infection among patients admitted to a tertiary care hospital.

Materials & Methods: The study was carried out at General surgery wards, Obstetrics and Gynaecology wards, orthopaedics wards. All the cases that were identified with SSI were included in the study. SSI was classified as superficial, deep incisional or organ/space infection. Diagnosis of SSI was done by the surgeon. A total 300 patients were recruited in the study. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Incidence of SSI was 11.67 percent of the patients. Out of these patients, incidence of SSI among patients undergoing caesarean section, orthopaedic procedures, intestinal surgeries, amputation and hernia was 16.67 percent, 20 percent, 23.07 percent and 6.67 percent respectively.

Conclusion: From the above results, it can be concluded that SSI is a frequent finding with intestinal surgery more prone to it.


Key words: Surgical, Site, Hospital, Infection.

*Correspondence to:

Dr. Surinder Kumar Garg,
Assistant Professor,
Department of General Surgery,
Pandit Jawaharlal Nehru Government Medical College,
Chamba, HP, India.

Article History:

Received: 02-06-2019, Revised: 29-06-2019, Accepted: 26-07-2019

Access this article online	
Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2019.5.4.082	

INTRODUCTION

Surgical site infection (SSI) is a hospital acquired infection (HAI) that arises following surgery and occurs within 30 days of an operation, or within one year, if an implant is used.¹ It has been estimated that SSIs account for 10–30% of all HAI.² A study conducted in the US found 21.8% of all HAI are SSIs.³ It has been generally found that developed nations tend to have lower incidence of SSIs when compared with developing nations. According to a study in the UK, the cumulative incidence of SSI was highest for gastrointestinal procedures, with large bowel surgeries having an incidence of 10.2%, and lowest for hip and knee prosthesis surgeries, with rates of 0.7% and 0.6% respectively.⁴

Other developed nations have low rates of SSIs, such as Sweden where the rate is 6.4%.⁵ In developing countries rates tend to be higher. Studies in Nepal, Thailand and Pakistan found SSI rates of 7.3%, 14.5% and 9.3% respectively.⁶⁻⁸

In India, a study in a tertiary care hospital showed a SSI rate of 2.1% in minimally invasive surgeries in comparison with an SSI rate of 16.2% for open surgeries.⁹

Despite improved understanding of the pathophysiology and improved methods of prevention and prophylaxis, surgical site infection remains the common cause of postoperative morbidity and mortality. It is therefore imperative to implement adequate measures to reduce this incidence and to prevent them, it is necessary to identify the epidemiology of this infections.¹⁰ Hence; the present study was conducted for assessing the incidence of surgical site infection among patients admitted to a tertiary care hospital.

MATERIALS & METHODS

The present study was conducted for assessing the incidence of surgical site infection among patients admitted to Pandit Jawaharlal Nehru Government Medical College, Chamba, HP, India.

The study was carried out at General surgery wards, Obstetrics and Gynaecology wards, orthopaedics wards. All the cases that were identified with SSI were included in the study. SSI was classified as superficial, deep incisional or organ/space infection.

Diagnosis of SSI was done by the surgeon. A total 300 patients were recruited in the study. A structured questionnaire form consisting of demographic data, risk factors, past medical history,

antibiotic usage history, and particulars of surgery, antibiotic prophylaxis was noted. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Table 1: Incidence of SSI

SSI	Number	Percentage
Present	35	11.67
Absent	265	88.33
Total	300	100

Table 2: SSI according to type of surgery

Type of surgery	Total surgeries	SSI; n (%)
Caesarean	42	7 (16.67%)
Orthopaedic surgeries	40	8 (20%)
Intestinal surgeries	39	9 (23.07%)
Amputation	45	3 (6.67%)
Hernia	20	3 (15%)
Others	14	4 (28.57%)
Total	300	35 (11.67)

RESULTS

In the present study, a total of 300 subjects were analysed. Overall, incidence of SSI was 11.67 percent of the patients. Out of these patients, incidence of SSI among patients undergoing Caesarean section, Orthopaedic procedures, Intestinal surgeries, Amputation and Hernia was 16.67 percent, 20 percent, 23.07 percent and 6.67 percent respectively.

DISCUSSION

Infections that occur in the wound created by an invasive surgical procedure are generally referred to as surgical site infections (SSIs). SSIs are the third most important causes of Hospital acquired infections & they account for a quarter of all nosocomial infections. These infections are associated with considerable morbidity and has been reported that over one-third of postoperative deaths are related to it. SSIs can range from a relatively trivial wound discharge with no complications to a life-threatening condition. Frequency of these infections varies from patients to patients. There are numerous patient-related (endogenous) and process/procedural related (exogenous) risk factors that can affect a patient's risk of developing an SSI. Some of these risk factors such as age and gender cannot be changed. However, number of other factors, such as diabetes, smoking, proper use of antibiotics and intraoperative technique can be improved to reduce the chances of developing SSIs.⁶⁻⁹ Hence; the present study was conducted for assessing the incidence of surgical site infection among patients admitted to a tertiary care hospital.

In the present study, a total of 300 subjects were analysed. Overall, incidence of SSI was 11.67 percent of the patients. M Siddique J Akhter et al calculated the incidence of surgical site infections (SSI) along with the main risk factors and causative organisms in postoperative patients. A total number of 1196 patients admitted to the general surgical ward or surgical ICU of our hospital were included in the study. The study showed an SSI rate of 11%. Risk factors associated with a higher incidence of SSI

were found to be age (>55 years), diabetes mellitus (especially uncontrolled sugar in the perioperative period), immunocompromised patients (mainly HIV and immunosuppressive therapy patients), surgeon skill (higher in senior professors compared with junior residents), nature of the cases, (emergency surgeries), placement of drains, wound class (highest in dirty wounds), type of closure (multilayer closure), prolonged duration of hospital stay, longer duration of surgery (>2 hours), type of surgery (highest in cholecystectomy). The highest rates of causative organisms for SSIs found were *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella ssp*. Prevention of SSIs requires a multipronged approach with particular emphasis on optimising preoperative issues, adhering religiously to strict protocols during the intraoperative period and addressing and optimising metabolic and nutritional status in postoperative period.¹⁰

In the present study, out of these patients, incidence of SSI among patients undergoing Caesarean section, Orthopaedic procedures, Intestinal surgeries, Amputation and Hernia was 16.67 percent, 20 percent, 23.07 percent and 6.67 percent respectively. Chada CKR conducted a study to assess surgical site infections in a tertiary care hospital. Two hundred patients were recruited in the study and the prevalence of SSI in the study was 3.83%. Patients who underwent emergency operations and diabetics were at higher risk of acquiring SSI. The most commonly isolated pathogens in the study were *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa*. *Pseudomonas aeruginosa* was most common isolate from orthopaedic cases of SSI, *Escherichia coli* was most common isolate from intestinal surgeries and *Staphylococcus aureus* from LSCS. Increased rate of isolation of MRSA and ESBL strains were observed in the study. Study clearly explains the various causes and risk factors associated in development of SSI.¹¹

CONCLUSION

From the above results, it can be concluded that SSI is a frequent finding with intestinal surgery more prone to it.

REFERENCES

1. Mangram, A.J., Horan, T.C., Pearson, M.L. et al. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol* 1999; 20: 4, 250–78.
2. Leaper, D.J., van Goor, H., Reilly, J. et al. Surgical site infection – a European perspective of incidence and economic burden. *Int. Wound Journal* 2004; 1: 4, 247–73.
3. Latham, R., Lancaster, A.D., Covington, J.F. et al. The association of diabetes and glucose control with surgical site infections among cardiothoracic surgery patients. *Infect Control Hosp Epidemiol* 2001; 22: 10, 607–12.
4. Malone, D.L., Genuit, T., Tracy, J.K. et al. Surgical site infections: Reanalysis of risk factors. *J Surg Res* 2002;103: 89–95
5. Mawalla B, Mshana SE, Chalya PL, Imirzalioglu C, Mahalu W. Predictors of surgical site infections among patients undergoing major surgery at Bugando Medical Centre in Northwestern Tanzania. *BMC Surg*. Aug 2011; 31;11(1):21.
6. Pear SM. Patient Risk Factors and Best Practices for Surgical Site Infection Prevention. *Managing Infect Control. Education & Training*, Workhorse Publishing L.L.C. 2007:56-64.
7. Neumayer L, Hosokawa P, Itani K. Multivariable predictors of postoperative surgical site infection after general and vascular surgery: results from the patient safety in surgery study. *J of the American College of Surg*. 2007;204:1178–87.
8. Magill, S.S., Edwards, J.R., Bamberg, W. et al. Multistate point-prevalence survey of health care-associated infections. *N Engl J Med* 2014; 370: 13, 1198–208.
9. Public Health England. Surveillance of surgical site infections in NHS hospitals in England, 2013/14. London: Public Health England 2014. (accessed March 2016) Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/386927/SSI_report_2013_14_final_3_.pdf
10. M Siddique J Akhter et al. Incidence of surgical site infection in postoperative patients at a tertiary care centre in India. *J Wound Care*. 2016 Apr;25(4):210-2, 214-7.
11. Chada CKR, Kandati J, Ponugoti M. A prospective study of surgical site infections in a tertiary care hospital. *Int Surg J* 2017;4:1945-52.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Surinder Kumar Garg. Incidence of Surgical Site Infections Among Patients Admitted to a Tertiary Care Hospital. *Int J Med Res Prof*. 2019 July; 5(4): 325-27. DOI:10.21276/ijmrp.2019.5.4.082