

Risk of SSI in Different Types of Emergency Abdominal Operation and Types of Incision: A Comparative Study

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Abstract:-

Introduction-SSI is the second most common complication following surgical procedure due to virulent bacterial entry,altered wound micro environment and changed host defence. Despite every effort to maintain asepsis, most surgical wounds are contaminated to some extent.

Material and methods-This was a descriptive type of cross sectional study in which 100 patients were selected randomly from department of surgery, Jawaharlal Nehru medical College hospital ,Bhagalpur .SSI rates were concluded in different types of operations and using different types of incision.

Results-The highest rate of SSI was seen in casesof volvulus and lowest rate of SSI was found in appendicectomy cases.Highest rate of SSI were seen in operation done through lower midline incision.

Conclusion- It was revealed that, overall surgical site infection rate was 21 %. It can be concluded from the findings of the study that and factors associated with surgery like type of incision, type of operation greatly contribute to occurrences of SSI

Keywords- SSI, Type of incision, Type of operation, emergency surgery

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I. Introduction

Surgical site infections are the third most common hospital associated infection, accounting for about 15 percent of all infections in hospitalized patients. Among surgical patients, surgical site infections are the most frequent cause of such infections, accounting for about 40 percent of the total. Despite every effort to maintain asepsis, most surgical wounds are contaminated to some extent. However infection rarely develops if contamination is minimal, if the wound has been made without undue injury, if the subcutaneous tissue is well perfused and well oxygenated and if there is no dead space.

Surgical site infection is the second most common complication following surgical procedure (first being post operative pneumonia)due to virulent bacterial entry ,altered wound micro environment and changed host defence . The incidence of infection, morbidity and mortality increases from clean to dirty. The risk of infection is greater in all categories if surgery is performed as an emergency (Kirk and Ribbens 2004). The risk of wound infection is influenced but not entirely determined by the degree of contamination. Multiple risk factors and perioperative characteristics can increase the likelihood of superficial surgical site infections. Important host factors include diabetes mellitus, hypoxemia, hypothermia, leucopenia, nicotine, long term use of steroids.

II. Materials And Methods

This was a descriptive type of cross sectional study,done at department of surgery,JLNMCH Bhagalpur for a duration of one year and 4 month starting from13 feb 2019 to 12 june 2020.Total 100 cases were included in this study.The method of selection was purposive non-random.The patients having emergency abdominal operations were only included in this study.No elective surgical patients were included.Patients with other comorbidities like COPD,diabetes etc. were excluded from the study. After admission short history was taken and physical examination was conducted on each patient admitted in surgery with acute abdomen. Only very essential investigations were done urgently for taking correct decision about the management. Patients requiring emergency abdominal surgery and fulfilling the inclusion criteria were offered to participate in the study. All the traumatic cases were excluded from the study.Thorough physical examination was done in each case. Only essential investigations were done for proper diagnosis and reduction of risk. All of the preoperative factors related to SSI present in the patient were noted down in the data sheet. After proper resuscitation (where applicable) and preparation, patients were sent to operation theatre for operation. Strict aseptic precautions were followed during the operation. Meticulous techniques were practiced as far as possible. The operation procedure

and related peroperative factors were observed directly and recorded in the data collection sheet instantly. During the postoperative period all the patients were closely monitored everyday up to the discharge of the patient from the hospital. If any symptom or sign of infection appear during this period then proper investigation was instituted for the diagnosis of infection and to assess the type and severity of the infection. If any collection of pus identified it was drained out and sent for culture and sensitivity test. Proper antibiotic was given to every patient both preoperative and post-operative periods. Appropriate management was given to each of the patients of surgical site infection. After completing the collection of data it was compiled in a systematic way.

Surgical site infection (SSI) was defined as Infections in the area of operational wound within 30 days.

Variables studied:

Dependent variable: Abdominal surgical site infection (SSI).

Independent variables:- Types of operations & Types of incisions.

III. Results

SSI distribution based on different types of incision

TYPE OF INCISION	SSI PRESENT	SSI ABSENT	TOTAL
Extended lower midline	1(50.00%)	1(50.00%)	2
Midline	8(33.33%)	16(66.66%)	24
Lower right paramedian	4(33.33%)	8(66.66%)	12
Rutherford morrison	2(25.00%)	6(75.00%)	8
Upper midline	2(13.33%)	13(86.66%)	15
Extended upper midline	2(10.00%)	18(90.00%)	20
Grid iron	0(0.00%)	6(100.00%)	6
Lanz	0(0.00%)	5(100.00%)	5
inguinal	1(12.50%)	7(87.50%)	8
Total	20(20.00%)	80(80.00%)	100

Rate of SSI was highest in operations done through lower right para median incision (1 in 2,50.00 %), whereas rate of SSI was 8 in 24(33.33%) in midline, 4 in 12 (33.33 %) in lower right para-median, 2 in 8 (25.00 %) in Rutherford Morison, 2 in 15 (13.33 %) in upper midline, 2 in 20 (10.00 %) in extended upper midline and 1 in 8(12.50%) in inguinal incisions. No infection occurred in 5 operations done through Lanz incision and 6 operations done through grid iron incision.

Table: Number of operations, SSIs and SSI rate (%) by category

Type of operation	SSI present	SSI absent	Total
Appendectomy	2(9.52)	19(90.48)	21
Adhesiolysis or resection and anastomosis	3(10.00)	27(90.00)	30
Repair of ileal perforation/ileostomy and thorough peritoneal toileting	5(42.00)	7(58.00)	12
Repair of duodenal ulcer perforation and thorough peritoneal toileting	3(20.00)	12(80.00)	15
Appendectomy with thorough peritoneal toileting	1(25.00)	3(75.00)	4
Resection of volvulus of sigmoid colon and primary anastomosis	5(50.00)	5(50.00)	10
Herniotomy and herniorrhaphy	2(25.00)	6(75.00)	8
Total	21(21.00)	79(79.00)	100

Out of 100 patients with emergency abdominal operations, rate of SSI in different operations were observed. It was found that in out of 21 acute appendicitis cases 2(9.52 %) developed SSI, out of 30 small intestinal obstruction cases due to band adhesions 3 (10.00%) developed SSI, out of 12 ileal perforation cases 5 (42.00 %) developed SSI, out of 15 duodenal ulcer perforation 3(20.00 %) developed SSI, out of 4 burst appendix cases 1 (25.00 %) developed SSI, out of 10 sigmoid volvulus cases 5 (50.00 %) developed SSI and it was 2(25.0%) among 8 obstructed inguinal hernia cases. The rate of SSI (50.00 %) was highest in volvulus cases and lowest in appendectomy operations.

IV. Discussion

The study was carried out with a view to determine the effect of different types of incision & different types of operations on the distribution of SSI. Out of 100 patients with emergency abdominal operations, rate of SSI in different operations were as follows: 2 in 20 (9.52%) acute appendicitis cases, 3 in 30 (10.00%) small intestinal obstruction, 5 in 12 (42.00%) ileal perforation, 3 in 15 (20.00%) duodenal ulcer perforation, 1 in 4 (25.00%) burst appendix, 5 in 10 (50.00%) sigmoid volvulus and 2 in 8(25.00%) in obstructed hernia cases. The highest rate of infection (50.00%) was in volvulus cases and lowest in appendectomy operations (Table 1). These findings were consistent with the result of Surgical Site Infection Surveillance (SSIS) for general surgery

which was published as Wexford General Hospital Surgical Site Infection (SSI) data report in 2009 showing number of SSI and rate of SSI (%) by category of operations.

Regarding incision wise infection rate, rate of SSI was highest in operations done via extended lower midline incision (1 in 2, 50.00%), whereas rate of SSI was 2 in 8 (25.00%) in Rutherford Morison, 2 in 15 (13.33%) in upper midline, 2 in 20 (10.00%) in extended upper midline and 1 in 8 (12.50%) in herniotomy incisions. No infection occurred in 5 operations done through Lanz incision and 6 operations through grid iron incisions (Table 2). In present study infection rate was higher in midline incisions that may be attributed to less vascularity of the linea alba and most contaminated and dirty cases were operated through these incisions.

V. Conclusion

Surgical Site Infections (SSIs), result from bacterial contamination during or after a surgical procedure. The risk of infection is greater in all categories if surgery is performed as an emergency. General objective of the study was to determine the distribution of SSI on the basis of perioperative/environmental factors like category of operations, types of incision, which will be helpful in reducing the rate of surgical site infection. It was revealed that, overall surgical site infection rate was 21 %.

It can be concluded from the findings of the study that and factors associated with surgery like type of incision, type of operation greatly contribute to occurrences of SSI. So, quality of surgical care including immediate assessment of patients, resuscitative measures, adequate preparation of patients and aseptic environment are important for control of SSI. This study has been carried out over a limited period of time with a limited number of patients and there was lack of financial and infrastructural support, it could not have been large enough to be of reasonable precision. All the facts and figures mentioned here may considerably vary from those of large series covering wide range of time, but still then, as the cases of this study were collected from a tertiary level hospital in our country, this study has some credentials in reflecting the facts regarding factors responsible for surgical site infection following emergency abdominal operations.

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