



A PROSPECTIVE OBSERVATIONAL STUDY OF POST OPERATIVE SURGICAL SITE INFECTIONS IN EMERGENCY ABDOMINAL SURGERIES IN A TERTIARY CARE HOSPITAL

General Surgery

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ABSTRACT

Introduction : Surgical Site Infection (SSI) continues to be a major problem associated with any operative procedure. The problem gets more complicated in case of emergency surgeries, where the surgeon has the least scope to prevent Surgical Site Infection pre-operatively due to urgency of surgical intervention. **Aims & Objectives:** To study the incidence, associated factors and micro organisms causing post-operative surgical site infection. **Material And Methods :** A prospective observational study included 100 patients undergoing emergency abdominal surgeries and of >12 year of the age in the Department of General Surgery, JLN Medical College & Associated Group of Hospitals, Ajmer (Rajasthan) between January 2023 to December 2023. **Results :** Overall incidence of SSI was 18%. SSI rates ranged from Acute appendicitis (5.56%) to ileal perforation (28.57%) across different emergency abdominal operations. It was highest on POD 5 (33.33%). The most common causative organism was E. coli in 50% cases. **Conclusion :** Multiple host, environmental and infective organism related factors determine the outcome of surgery.

KEYWORDS

Surgical Site Infection, emergency abdominal surgery, post operative day

INTRODUCTION

Surgery has made great advances in the last few decades and post operative wound infection is the commonest complication faced by surgeons since the advent of surgery. Surgical Site Infection (SSI) continues to be a major problem associated with any operative procedure. The problem gets more complicated in case of emergency surgeries, where the surgeon has the least scope to prevent Surgical Site Infection pre-operatively due to urgency of surgical intervention.

SSI is defined as serous or purulent discharge from wound within 30 days post-operatively and one year if prosthetic material is used like mesh repair in hernia surgery or prosthetic valve in cardiac surgery etc.¹ Despite improvements in surgical techniques, sterilization of instruments, operation theatre practices and the best efforts of infection prevention strategies, SSIs remain a major cause of hospital-acquired infections². Surgical site infection is the most important cause of morbidity and mortality in the post operative patients, but it is preventable in most of the cases if proper assessment and appropriate measures are taken by the surgeons, nursing staffs, patients and others in the perioperative period³.

Aims And Objectives : To study the incidence, associated factors and micro organisms causing post-operative surgical site infection.

MATERIAL AND METHODS

A prospective observational study included 100 patients undergoing emergency abdominal surgeries and of >12 year of the age in the Department of General Surgery, JLN Medical College & Associated Group of Hospitals, Ajmer (Rajasthan) between January 2023 to December 2023.

All the selected patient's histories, clinical presentations and physical findings were recorded according to the Proforma. Thorough physical examination was done in each case. Only essential investigations were done for proper diagnosis and reduction of risk. All patients were evaluated by clinical features suggestive of post-operative wound infections. Appropriate antibiotic was given to every patient during both pre-operative and post-operative periods. Antibiotic was changed where necessary after getting the report of culture and sensitivity test. Post-operative events were recorded during every day follow-up. Patients undergoing surgery were followed up on outpatient/ inpatient basis till 30 post-operative days and each patient was assessed for wound pain, fever, wound discharge, wound healing and wound

dehiscence.

Data Analysis

Data analysis was done both manually and by using computer. Calculated data were arranged in systemic manner, presented in various table and figures and statistical analysis was made to evaluate the objectives of this study.

RESULTS :

Table 1 : Number Of Operations, Ssi And Ssi Rate (%)

Diagnosis	SSI Yes		SSI No		Total	
	No.	%	No.	%	No.	%
Acute Appendicitis	1	5.56	17	94.44	18	100
Perforated Appendicitis / Appendicular abscess	1	12.50	7	87.50	8	100
Peptic Perforation	4	26.67	11	73.33	15	100
Obstructed Hernia	1	8.33	11	91.67	12	100
Intestinal Obstruction	5	26.32	14	73.68	19	100
Ileal perforation	2	28.57	5	71.43	7	100
Jejunal perforation	1	25.00	3	75.00	4	100
Ruptured Liver Abscess	2	22.22	7	77.78	9	100
Sigmoid Perforation	0	0.00	3	100.00	3	100
Caecal perforation	1	20.00	4	80.00	5	100
Total	18	100	82	100	100	100

Table 2 : Incidence Of Ssi In Different Post Operative Days

S. No.	Post Operative Days	No. of Infected Patients	Percentage of Infected Cases
1	POD 1	0	0.00
2	POD 2	0	0.00
3	POD 3	1	5.56
4	POD 4	2	11.11
5	POD 5	6	33.33
6	POD 6	5	27.78
7	POD 7	2	11.11
8	POD 8	1	5.56
9	POD 9	1	5.56
10	POD 10	0	0.00
Total		18	100.00

Table 3 : Distribution Of Micro-organisms Isolated From Ssi

S.No.	Micro-Organisms	No. of Isolated	Percentage
1	E. coli	9	50.00
2	Coagulase + Staph. aureus	5	27.78
3	Klebsiella sp.	2	11.11
4	Pseudomonas sp.	1	5.56
5	No growth	1	5.56

DISCUSSION :

It was revealed that among 100 patients, 18 developed surgical site infection. Overall rate of SSI was 18%. This finding is consistent with the finding of Razavi et al. (2005)⁴, where they found 139 (17.40%) patients among 802 suffered from SSI.

Rate of SSI in male was 18.8%, whereas among females it was 16.7%. Rate of SSI was slightly higher in males which was not statistically significant. Findings are consistent with Shah JV et al. (2018)⁵ where incidence of SSI in male was 17.64% and in female 16.23%. And in the study Panwar OP et al (2020)⁶ rate of SSI in male was 17.98% and in female 15.69%, which was not statistically significant.

In our study out of 100 patients with emergency abdominal operations, rate of SSI in different operations were observed. It was found that out of 18 acute appendicitis cases 1 (5.56%) developed SSI, out of 8 perforated appendicitis cases 1 (12.50%) developed SSI, out of 15 peptic perforation cases 4 (26.67%) developed SSI, out of 12 obstructed hernia 1 (8.33%) developed SSI, out of 19 intestinal obstruction cases 5 (26.32 %) developed SSI, out of 7 ileal perforation cases 2 (28.57%) developed SSI, Out of 4 jejunal perforation cases 1 (25%) developed SSI, out of 9 ruptured liver abscess cases 2 (22.22%) developed SSI, out of 5 caecal perforation cases 1(20%) developed SSI. These findings were consistent with the result of surgical site infection surveillance (SSIS) for general surgery, which was published as Wexford General Hospital SSI data report in 2009 showing number of SSI, rate of SSI (%) by category of operation. They done 132 appendectomy among them SSI occurred in 7 (5.3%). SSI occurred in 10 (19.2%) cases among 52 colonic surgeries, 4 (23.5%) cases among 17 small bowel surgeries, 5 (26.3%) among 19 laprotomies. No SSI was reported in 82 herniorrhaphy cases. (Surgical Site Infection Surveillance for general surgery, 2009)⁷.

In the present study it was observed that most of the infections (88.89 %) were started between 4th and 8th post operative days (POD) and it was highest 6 (33.33%) on 5th POD. Among a total of 18 patients with surgical site infections, in only one patient (5.56%) features of infection first appeared on 3rd POD and it was 2 (11.11 %) on 4th, 6 (33.33%) on 5th, 5 (27.78 %) on 6th, 2 (11.11 %) on 7th, 1 (5.56 %) on 8th and 1 (5.56 %) on 9th POD. These findings are consistent with Panwar OP et al. (2020)⁶ where rate of SSI was highest (33.33%) on 5th POD. Rate of SSI was 4.17%, 12.50%, 33.33%, 25%, 12.50%, 8.33% and 4.17% on 3rd to 9th POD respectively.

In the present study E. coli were found as the commonest organism (9 among 18 cases) causing 50 % of the surgical site infections. Staph. aureus were the second most common organism (5 among 18 cases) causing 27.78 % of the infections. Each of klebsiella (2 among 18 cases) causing 11.11 % of the infections and pseudomonas (1 among 18 cases) causing 5.56 % of the infections. And no growth was detected in one case with sero-sanguinous discharge. These findings are consistence with Ramadoss P et al. (2018)⁸ in which most common isolated organism was E. coli (45.83%), Staph. aureus was found in 37.50% cases and Klebsiella and pseudomonas was found in 8.33% cases each. These findings are also consistent with Jain S et al (2021)⁹ in which E. coli was most common (33.33% cases) isolated organism following emergency surgeries.

CONCLUSION

SSI continues to be a major problem associated with any operative procedure. The problem gets more complicated in case of emergency surgeries, where the surgeon has least scope to prevent SSI pre-operatively due to urgency of surgical intervention. Hence most of preventive strategies must be adopted to minimize contamination of wound during intra-operative and post operative periods.

Various host factors like malnutrition, obesity, patients knowledge about hygiene, presence of co-morbidity etc. coupled with environmental factors such as condition of the wounds, delay to initiate operation, duration of operation, prolonged exposure of peritoneal cavity to environment, prophylactic use of antibiotics and

factors associated with surgery like type of incision, type of operation and experience of operating surgeon 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.

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