

Original Article

SURGICAL SITE INFECTION FOLLOWING CAESAREAN SECTION: FREQUENCY, ETIOLOGICAL FACTORS AND MANAGEMENT

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ABSTRACT

Objectives: The aim of the study was to determine the frequency of surgical site infection (SSI), the etiological factors and its management in elective and emergency cesarean sections.

Methods: This prospective study was conducted on women who underwent caesarean section at GMC, Haldwani from 1 st August 2012 to 31st July 2013. Two groups were made. Group -I comprised of 128(15.50%) cases that underwent elective caesarean sections while group - II comprised of 698(84.50%) cases that were unbooked and presented in emergency. The surgical aseptic technique was same in both the groups including antibiotic prophylaxis. All the patients were admitted for at least 5 days postoperatively and abdominal dressings changed on 3rd postoperative day and on 5th day before being discharged, follow-up was done on 8-10th day including assessment for surgical site infections. Infections that met standard case definitions were identified during hospital stay and follow up within 30 days of operation.

Results: A total 826 patients underwent elective/emergency caesarean section for various indications, out of which, 74 patients had surgical site infections. The frequency of surgical site infection in group - I was 2.34% (n=3) and in group - II 10.17% (n=71). Of the total 74 cases of SSI in both the groups, 61 (82.43%) were superficial in nature, 13(17.57%) deep. 86% of the infections occurred after hospital discharge. 20 of these women were rehospitalised and 11 were reoperated. The commonest isolate was E. coli (28%) followed by Staphylococcus aureus (20%) and coagulase negative Staphylococcus (17%). 23.8% of Staphylococcus aureus strains were MRSA.

Conclusion: A proper assessment of risk factors that predispose to SSI and their modification may help in reduction of SSI rates. Frequent antimicrobial audit and qualitative research could give an insight into the current antibiotic prescription practices and the factors affecting these practices.

Key Words – Surgical site infection, Caesarean section, Wound infection

INTRODUCTION:

Surgical site infection causes more than 20% of all healthcare-associated infections. Cesarean section is

one of the most common surgical procedures performed worldwide.¹ Postoperative SSI delays recovery and leads to increase morbidity. Some of these infections can lead to severe health problems or even death.² Measures should be taken that can help to prevent this type of infection.³ Cesarean sections are performed either as emergency or elective procedures depending upon the indications. Elective operation is defined as a cesarean section that was planned at least 24 hours before the intervention.⁴ SSI is defined as infection occurring in surgical wound within 30 days of operation. It can be superficial, deep or organ/ space related. Host susceptibility, degree of microbial contamination of a surgical site, pre-existing risk factor and duration of operation are predictors of surgical site infection risk.⁵⁻⁷

Approximately 5% of patients undergoing surgery develop SSI.⁸ SSI results in delays in wound healing with subsequent increased treatment costs, prolonged hospital stays, a greater likelihood of admission to the intensive care unit and higher postoperative mortality.⁹ The goal of this study was to find out the frequency of surgical site infection in elective and emergency cesarean sections, etiological factors and its management.

MATERIALS AND METHODS

After approval of hospital ethics committee, this observational study was carried out on women who underwent caesarean section at Government medical college and associated Susheela Tiwari Government hospital, Halwani, Nainital from 1st August 2012 to 31st July 2013. In the study, eight hundred twenty-six patients undergoing elective/emergency caesarean section were included.

The patients' age group was between 18-41 year and belonged to American Society of Anesthesiologists (ASA) physical status class 1-3

as well as medically optimized ASA-class 4 patients. Two groups were made. Group - I comprised of 128(15.50%) cases who underwent elective caesarean sections while group - II comprised of 698(84.50%) cases who were unbooked and presented in emergency with or without having the antenatal clinic visits. The standard preoperative assessment was done in both the groups including blood complete examination, urine analysis, blood sugar and obstetric ultrasound. The regional and general anesthesia was given under standard protocols. The surgical aseptic technique was same in both the groups including antibiotic prophylaxis. All the patients were admitted for at least 5 days postoperatively and abdominal dressings changed on 3rd postoperative day and on 5th day before being discharged. The follow-up was done on 8-10th day including assessment for surgical site infections. Infections that met standard case definitions were identified during hospital stay and follow up within 30 days of operation.

Patients who presented with signs and symptoms of SSI were managed according to the severity and samples of pus were sent for culture and sensitivity. In superficial incisional SSI, only skin or subcutaneous tissues were involved. In deep incisional SSI, there was purulent discharge from the deep incision, but not from organ or space compartment.¹⁰

Data was compared and analyzed by SPSS version 17. Chi-square test was used to check interdependence between the two groups elective/emergency variables.

RESULTS

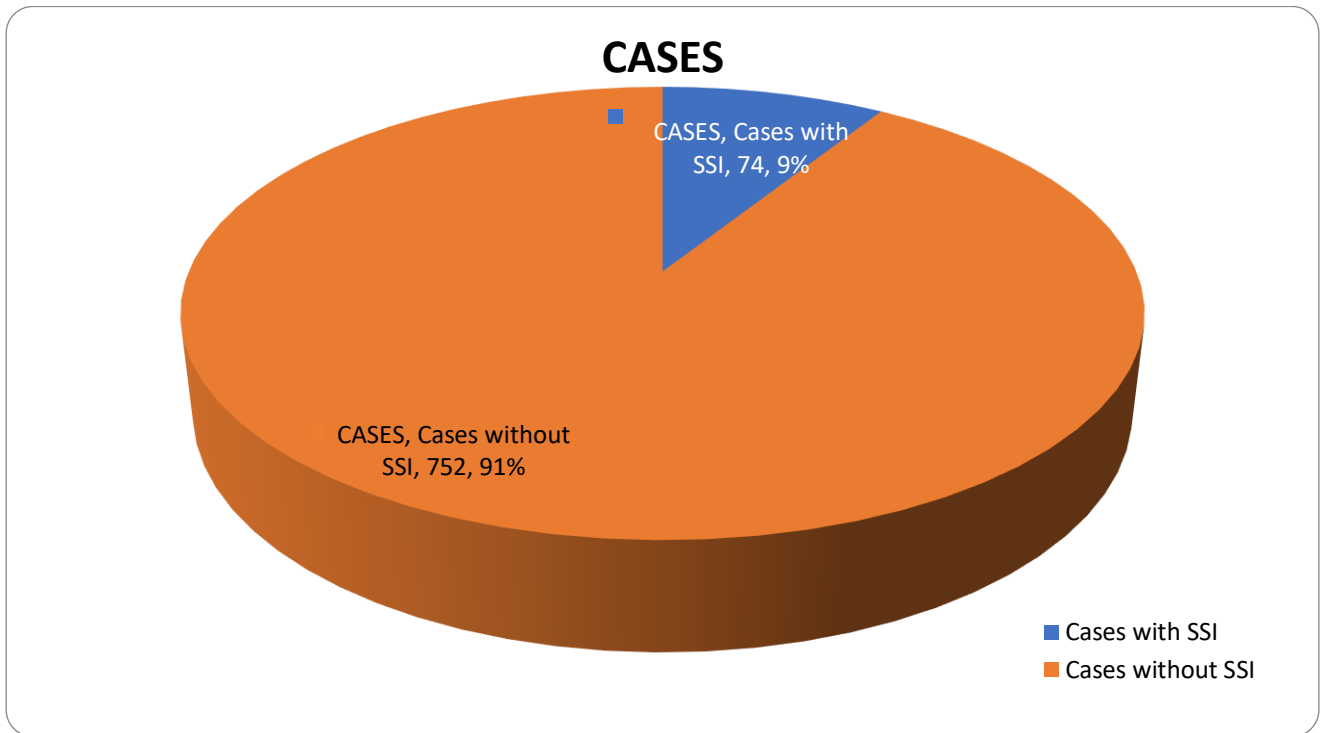
A total 826 patients underwent elective/emergency caesarean section for various indications, out of which, 74 patients had surgical site infections. The frequency of surgical site infection in group - I was 2.34% (n=3) and in group - II 10.17% (n=71). The general demographic data of both the groups are shown in table-I. Of the total 74 cases of SSI in both the groups, 61 (82.43 %) were superficial in nature, 13(17.57 %) deep. 86% of the infections occurred after hospital discharge.

Risk factors like personal hygiene and nutritional status, anemia and handling by Dai/ local health worker and duration of surgery played a significant role in causing surgical site infection. Our study revealed a surgical site infection rate of 2.34% in cases of elective caesarean section while it was 10.17% in emergency cases.

In all the cases of superficial and some of deep SSIs, patients were managed by repeated dressings and broad-spectrum oral antibiotics on outpatient basis. 20 of these women were re-hospitalised and 11 were reoperated. There was no peritonitis or mortality.

Single microbial infection was noted in 48 (64.86%) cases and polymicrobial infection in 26 (35.14%). The commonest isolate was E. coli (28%) followed by Staphylococcus aureus (20%) and coagulase negative Staphylococcus (17%) .23.8% of Staphylococcus aureus strains were MRSA.

FIGURE No.1. TOTAL NUMBER OF CASES



		SSI	No SSI
ELECTIVE SECTION	CESARIAN	3	125

EMERGENCY SECTION	CESARIAN	71	627
P value = 0.003			

FIGURE No. 2. TOTAL NUMBER OF SUPERFICIAL AND DEEP WOUND

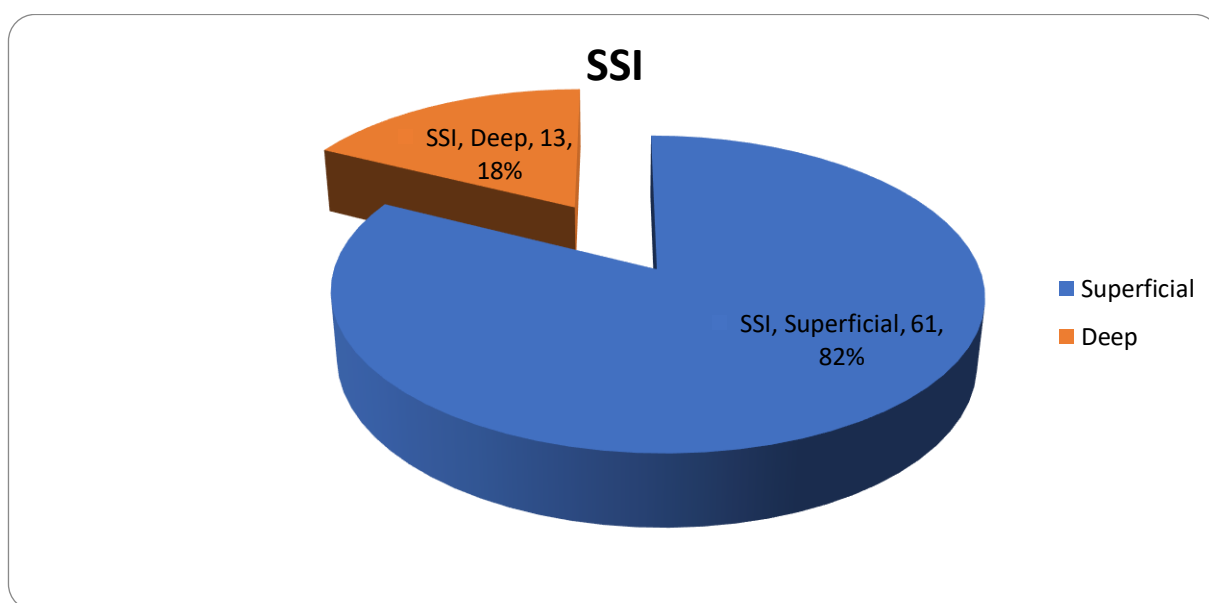


TABLE No.2. CORRELATION WITH ANEMIA		
	SSI	No SSI
MILD (Hb = 9-10 gm%) n= 183	22	161
MODERATE (Hb = 7-9gm%)n=27	7	20
SEVER (Hb <7 gm%) n=17	16	01
P value= 0.001		

TABLE No. 3 CORRELATION WITH DAI HANDLING		
DAI HANDLING	SSI	No SSI
PRESENT(n=163)	61	102

ABSENT (n =663)	13	650
P value = 0.003		
TABLE No. 4. CORRELATION WITH OBESITY		
OBESITY(BMI)	SSI	NO SSI
25-29.99(n =70)	12	58
30-34.99(n=63)	14	49
35-39.99(12)	5	7
>40(4)	2	2
P value= 0.001		

TABLE No. 4. CORRELATION WITH DURATION OF SURGERY		
DURATION	SSI	NO SSI
<60 MIN(n=710)	52	658
60-90MIN(n=107)	19	88
>90 MIN(n=9)	3	6
P value = 0.004		

TABLE No.5 CORRELATION WITH NUMBER OF PREVIOUS SECTION		
	SSI	NO SSI
PRIMIGRAVIDA	24	252
PREV- 1- LSCS	21	309
> PREV- 1- LSCS	29	191

P value =0.002		
TABLE No.6.CORRELATION WITH DIABETIS		
DIABETIS	SSI	NO SSI
CONTROLLED	4	20
UNCONTROLLED	6	2
P value = 0.001		

DISCUSSION

Hospital infection control programs are important component to improve quality of healthcare services, duration of hospital stay, decrease morbidity and mortality. Surgical site infections are one of the most common types of nosocomial infections.¹¹In this study cesarean section procedure was addressed as it is the most commonly performed surgery.

In the present study the frequency of surgical site infection was affected by duration of surgery.¹²The frequency was higher with duration of cesarean sections lasting for more than 90 minutes. Similar results were found in a study by Anvikar et al which reported 2.6% SSI in surgeries of duration less than 1 hour, 4.8% SSI in surgeries lasting between 1-2 hours and 5.4% SSI in surgeries of more than 2 hours duration.¹³

Poor nutritional status, personal hygiene, anemia and handling of cases by the untrained health workers/Dai were important factors for SSI. These factors were present mainly in patients of group II. Frequency of SSI in repeated surgeries i.e., cesarean in patients with previous scar is more in present study. SSI leads to longer postoperative hospital stay which results in prolonged exposure to the potentially infective hospital environment.¹⁴ Length of hospitalization and duration of stay was not significant in our study. Jido TA et al reported 9.1% SSI from Nigeria¹⁵ while Wanger MB et al reported 8.7%¹⁶ SSI in Brazil. The importance of the study lies in the fact that it is from a developing country in a rural set up, where maternal morbidity and mortality is high.

CONCLUSIONS

The frequency of surgical site infection was 2.34% in elective cesarean section while it is 10.17% in emergency cesarean section. Poor nutritional status, personal hygiene, anemia, previous scar and handling by the untrained health workers/Dai were important factor leads to SSI. Length of hospital stay and duration of surgery were found to be minor risk factors responsible for causing surgical site infection. E. coli was the most common organism isolated followed by Staphylococcus aureus.

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