ANALYSIS OF SURGICAL SITE INFECTION IN CAESAREAN SECTION

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DOI: 10.47750/pnr.2022.13.S06.133

Abstract

Globally there is increase trend in caesarean section. Current rate of CS in India has increased from 8.5% in 2005-06 to 21.5% in 2019-20.[NFHS5]. WHO guidelines have recommended a CS rate of 15%. Caserean sections can lead to many significant complications; one of these critical complications is Surgical Site Infection (SSI) [who] according for 38% of hospital acquired infection

INTRODUCTION

Globally there is increase trend in caesarean section. Current rate of CS in India has increased from 8.5% in 2005-06 to 21.5% in 2019-20.[NFHS5]. WHO guidelines have recommended a CS rate of 15%. Caserean sections can lead to many significant complications; one of these critical complications is Surgical Site Infection (SSI) [who] according for 38% of hospital acquired infection

The occurrence of an SSI following LSCS in literature ranges from 6-15%.

The development of SSI in LSCS depends on a complex interplay of many factors including wound class, immune status, maternal age, ASA classification, Hypertension, Number of vaginal examinations, virulence of microorganism, Maternal weight, Surgical techniques, and Premature rupture of membrane.

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity, prolonged hospitalization, and death.

SSI is associated with a mortality rate 3% and 75% of SSI associated deaths are directly attributable to the SSI.

Given the importance of these infections, we designed a study to comprehensively assess the rate of surgical site infection during the initial inpatient study and study the microorganism related with it, to know the area where active intervention to be taken in order to decrease the overall burden of SSIs.

Aims and Objectives

Aim: Analysis of surgical site infection in caesarean section

Objectives:

Primary Objectives:

Determine the incidence of SSI in LSCS

Secondary Objectives:

1. To determine the factors associated with SSI during LSCS.

2. To identify common causative microbial agents responsible for SSI

Materials and Methods:

Study site: Department of Obstetrics & Gynaecology, GMERS Medical College & Hospital, Sola, Ahmedabad.

Study Population: All pregnant patients undergoing LSCS at GMERS Medical College & Hospital, Sola , Ahmedabad during study period.

Study design: A Prospective, observational, cohort study.

Sample size: 1167 patients of LSCS admitted in obstetrics and gynaecolgy department in Sola Civil Hospital, Ahmedabad over a study period of 1 year from April 2021 to April 2022.

Inclusion criteria: Pregnant patients undergoing LSCS and give consent to take part in study

Exclusion criteria: Immunocompromised patients.

Methodology:

Informed consent taken from every patient included in present study. Data was collected as Predesigned Proforma for all patients who undergo LSCS in OBGY department. Risk factors like patient's characteristics, (age, socioeconomic & demographic profile, menstrual history, obstetrical history, history of previous operation, medical illness, ASA score); information regarding preoperative investigations (Hemogram. Total leucocyte count, differential leucocyte count, liver function test, Renal function test, blood grouping), and procedure characteristics (preoperative stay, type of operation, type of anesthesia, type of wound, preparation and duration of surgery, drain used or not) was taken note of. All patients were received prophylactic antibiotics as per hospital protocol (cefotaxime, gentamycin, metronidazole). Detail General Examination, including BMI, systemic Examination was conducted and daily vitals (pulse, Blood Pressure, Temp. Respiratory rate) were taken.

Postoperatively women were monitored for signs of infection. Surgical wound was inspected at the time of first signof SSI and daily there after till the discharge of patient. All patients were follow up to 7th postoperative day. Those who do not develop SSI suture removal was done on 7th post-operative day. SSI was defined by CDC criteria. Information about the SSI would include the date of SSI, specific criteria met for identifying the SSI, when/how the SSI is detected, whether the patient develops a secondary bloodstream infection, and the organisms isolated from cultures and the organisms' antimicrobial susceptibilities.

Group A: SSI- 46 cases

Group B:NO SSI-1121 cases

Statistical methods:

Chi square test was applied for statistical analysis of qualitative data. In some tables, when cell value was < 5, YATES correction was applied.

$P<0.05$- Statistically significant.

Statistical analysis was performed by using Analytical tool pack of Microsoft excel-2010 and 2007 and online on www.quantpsy.com.

Results and Observation

Table 1. Association of SSI with type of surgery

Type of surgery	Group A (SSI Group)	Group B	Chi square	P value
Emergency	44 (95.65 %)	841 (75 %)	10.2621	0.001358
Elective	2 (4.3 %)	280 (24.98 %)		
Total	46 (100 %)	1121 (100%)		

Patients were divided in two groups. Group A indicates patients with SSI while Group B comprises of patient with no SSI. Above Table suggests Incidence of SSI was higher in patients who underwent Emergency LSCS. Association between type of surgery (Emergency/ Elective) and SSI was statistically significant.

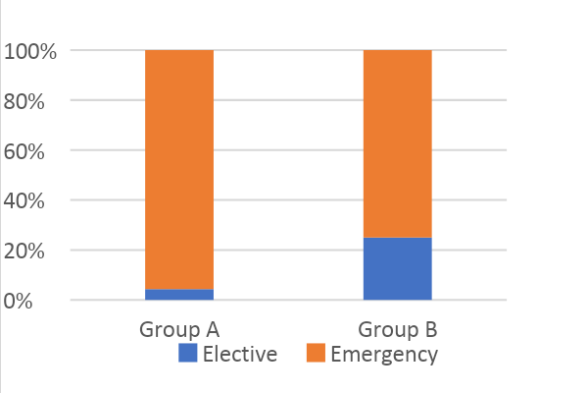


Table 2. Association of SSI with fat thickness

Fat thickness	Group A (SSI Group)	Group B	Chi square test	P value
< 2 cm	13 (28.3%)	212(23.32 %)	2.4817	0.1151
>2 cm	33 (71.73 %)	909 (81.08 %)		
Total	46 (100 %)	1121 (100%)		

Above data suggest that association between Fat thickness and SSI is not statistically significant.

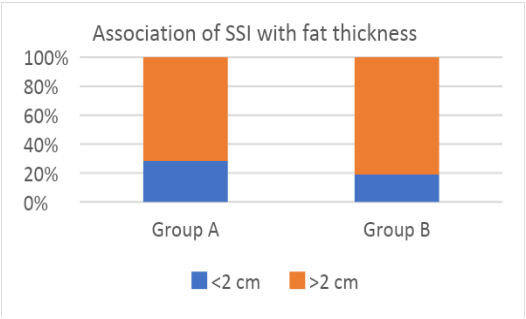
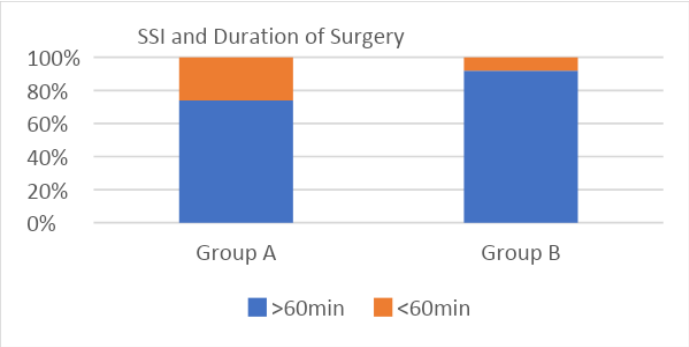


Table 3. SSI and duration of surgery

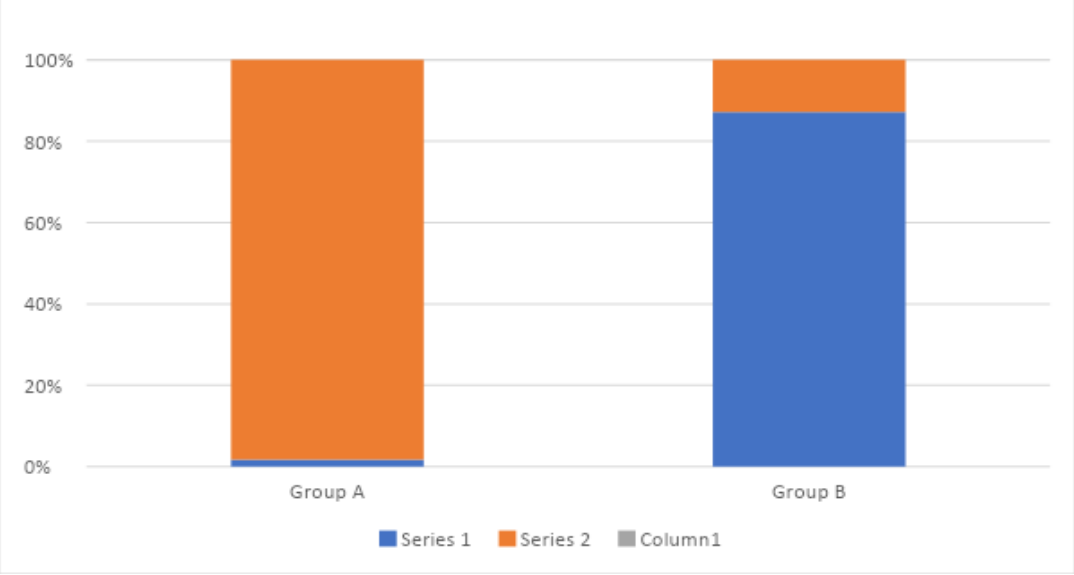
Type of surgery	Group A (SSI Group)	Group B	Chi Square	P value
>60 min	34 (73.91%)	1031 (91.97%)	18.0652	0.000021
<60 min	12 (26%)	90 (8.02%)		
Total	46 (100%)	1121 (100%)		



Above data suggests that incidence of SSI was higher when duration of surgery was more than 60 minutes. Association between SSI and duration of surgery was statistically significant.

Table 4. PROM and SSI

PROM	Group A (SSI Group)	Group B	Chi square	P value
Absent	16 (34.78%)	896 (79.92%)	52.7398	0.00001
Present	30(65.21%)	225 (20.07%)		
Total	46 (100%)	1121 (100%)		



Above data suggests that incidence of SSI was higher when patient had Premature Rupture of Membrane (PROM). Association between PROM and SSI is statistically significant.

Table 5. Organisms Isolated

Name of organism	Number of cases	Percentages
MRSA	18	39.13%
E.Coli	04	8.70%
Pseudomonas	01	2.17%
Sterile	08	17.39%
Other Organism	15	32.61%

Above table suggests that most common organism isolated was MRSA, while 17.39% samples found to be sterile

Discussion

The number of caesarean sections performed has recently doubled. Surgical site infection following CS is one of the most common obstetric complications, it causes massive burdens on both the mother and the health care system and it is associated with high morbidity and mortality. It has been reported that the incidence of SSI after CS varied between 3 and 15%

The rate of SSI after caesarean section in our study was 4.94 % which is comparable to 4.4% detected by Ganesh et al & 4.2% as detected by Al Jama FE. A study of SSI following CS in Nigeria reported overall wound problem of 13.5% and SSI of 8.9%. K. Bhavani et al .found, in there study of 1000 cases incidence of SSI after LSCS was 13.5%. Emergency CSs rate was significantly higher in SSI group (95.65 % vs 4.3 %; p 0.001358) which is similar to study of Khaled et al (81.2% vs. 64.3%; $p < 0.001$, COR = 2.40).

Premature Rupture of Membranes was the risk factors detected in study by K. Bhavani et al4 which also seen in our study (65.21% , p value 0.00001). Our study found that incidence of SSI was higher when duration of surgery was more than 1 hour (Incidence73.91%, p value 0.000021) same result was found in study of Khaled et al5 and Killian CA et al . similar result was noted in our study 10 SSI after cesarean delivery has a distinctive microbial source of pathogens composed of both skin and vaginal origin 11.MRSA (39.13%) was the commonest pathogen to produce SSI in our series, followed by sterile culture in 32.61 % cases. The increase in the presence of MRSA in study group is a serious concern. The other organisms found to be growing together were E. coli, MRCONS and pseudomonas. K. Bhavani et al4. and Ganesh et al3 also found that most common pathogens were S. aureus. Most of the women developing wound infections had no complaint but was discovered on day of suture removal by clinician. only 5 % patients had complaints of fever pain, and wound discharge and redness. In our study, SSI was detected on 6±2 days which is similar to study of Ganesh et al3 (5±2).

Conclusion

The present study highlights on the incidence of wound infection, possible risk factors for SSI and etiology of wound infection. Incidence of SSI in present is 3.94%. It was evident from present study that patients having emergency LSCS and duration of surgery ≥ 60 minutes and history of PROM have more chance of SSI. We isolated staphylococcus aureus as a most common (39.13 %) microorganism causing wound infection.

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