

Original Articles

Surgical Site Infection in Caesarean Section – A Prospective Cohort

Dr. Hardi Shukla*, Dr. Samrudhi Jain**, Dr. Ajesh N. Desai***

*Resident in OBGY, **Resident in OBGY, ***Professor & Hod in OBGY

Department of Obstetrics and Gynecology, GMERS Medical College and Hospital, Sola, Ahmedabad.

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ABSTRACT

Background : Surgical site infection (SSI) is one of the most common complications following caesarean section, and has an incidence of 3%–15%. With the global increase in caesarean section rate, it is expected that the occurrence of SSI will increase in parallel, hence its clinical significance. Optimization of maternal comorbidities, appropriate antibiotic prophylaxis, and evidence-based surgical techniques are some of the practices proven to be effective in reducing the incidence of SSI.

Material & Method: Prospective, cohort, observational study conducted in tertiary care hospital. Women undergoing LSCS during study period were monitored for SIS and its associated risk factors.

Result : During the study period total 324 patients undergone LSCS, among them 26 patients had wound site infection. Increase incidence of SSI in the presence of PROM and BMI ≥ 25 , in emergency LSCS and also with increase duration of the surgery, which is statistically significant. ($p < 0.05$). 42.3% patients had no growth in their culture sensitivity report.

Conclusion: The present study highlights on the incidence of wound infection, possible risk factors and etiology of wound infection. Incidence of SSI in this study is 8.02%. In SSI Staphylococcus Aureus is most common organism.

INTRODUCTION

- Caesarean section is most commonly performed major abdominal surgery among women in both developed and developing countries.
- Globally the rate of C-Section is 15%.^[1] In India average rate of C-Section is 17.2 %, varying from 30-50% in different states. (WHO 2017)
- Surgical site infection are the most common nosocomial infection, accounting for 38% of hospital acquired infection.^[2]
- The development of an SSI after LSCS depends on many factors including: wound type, immune status, maternal age, PIH,^[9] chorioamnionitis,^[7,9] type of organism, virulence of microorganism, maternal weight, surgical techniques, PROM,^[8] gestational diabetes.^[10]
- Advances have been made in infection control practices, improved OT ventilation, sterilization methods, surgical techniques, antimicrobial prophylaxis, SSI remain a substantial cause of morbidity and prolonged hospital stay.^[3]

- Surveillance program of SSI includes the use of epidemiologically sound definitions and effective methods, stratification of SSI rates according to risk factors associated with SSI development.^[3-5]

AIMS AND OBJECTIVES

Aim : Analysis of surgical site infection in caesarean section.

Objectives:

Primary objective: to determine the incidence of SSI in LSCS.

Secondary objectives:

1. To identify the factors responsible for development of SSI.
2. To identify common microbial agents for SSI.
3. To establish the relation between BMI, PROM and SSI.
4. To assess the relation between Anemia and SSI.

MATERIALS AND METHODS

Study Site : Department of Obstetrics and Gynaecology, GMERS Medical college & Hospital, Sola, Ahmedabad.

Correspondence Address : Dr. Hardi Shukla
907, PG Hostel, GMERS Medical College and Hospital, Sola, Ahmedabad.
Email id : shukla.hardi93@gmail.com

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

Study design : A Prospective, Observational, cohort study.

Inclusion criteria: pregnant patients undergoing LSCS .

Total 324 patients of LSCS admitted in obstetrics and gynaecology department on Sola Civil hospital, Ahmedabad over a study period 1st august to 31st october, 2019.

Exclusion criteria: immuno compromised patients.

Methodology :

Risk factors like patient's characteristics (age, socioeconomic status, obs and menstrual history, medical and surgical history) information regarding routine preoperative investigations, procedure types (type of operation, type of anaesthesia, type of wound, duration of operation) was taken note of.

All patients were received prophylactic antibiotics(Cefotaxim, Gentamycin, Metronidazole) for 5 days.

Postoperatively women were monitored for signs of infection. All the patients were followed up to 7th

postoperative day.

During the study period total 324 patients undergone LSCS, among them 26 patients had wound site infection including wound discharge, inflammation, wound gapping as per CDC criteria.

GROUP A : SSI = 26 cases

GROUP B : NO SSI = 298 cases

OBSERVATION AND RESULT:

Table 1 shows relationship between age, parity and BMI of the patient and risk of SSI.

Incidence of SSI is higher in patients from rural area than in urban area which is statistically significant. Probable reason behind it is poor hygiene and less cleanliness will predispose to more chances of infection.

Table 2 shows increase incidence of SSI in the presence of PROM and BMI ≥ 25 which is statistically significant. ($p < 0.05$). Also presence of diabetes and post operative anemia is statistically significant risk factors for the development of SSI ($P < 0.05$).

Table 3 shows increase incidence of SSI in emergency LSCS and also increase risk with increase duration of the surgery, both statistically significant. ($p < 0.005$)

Table 1: Association of Age, parity and socio - economic status and residence with SSI

	GROUP A	GROUP B	
Age (years)			
<35	25 (96.15%)	288 (94.65%)	
>35	1 (100%)	10 (3.35)	
Mean age	27.3	25.6	
Parity			P value
Primipara	9 (34.6%)	110 (36.95%)	0.815
Multipara	17(65.4%)	188(63.1%)	
Residence			
Rural	9(34.4%)	21(7%)	<0.05
Urban	17(65.4%)	277(93%)	
Socio economic class			
Higher	0(0%)	3(1%)	
Middle	8(30.5%)	157(48.4%)	
Lower	18(69.5%)	164(50.6%)	

Table 2 : Association of PROM, BMI, Diabetes and anemia with SSI.

	GROUP A (N=26)	GROUP B (N=298)	Incidence	P value
PROM				
Present (32)	8(30.8%)	24(8%)	26%	0.0001
Absent (292)	18(69.2%)	274(92%)	6.16%	
BMI				
<25 (241)	14(53.8%)	227(76.17%)	5.8%	0.0123
>=25(83)	12(46.16%)	71(23.83%)	14.4%	
Diabetes				
Yes (10)	4(15%)	6(2.01%)	40%	<0.05
No (314)	22(85%)	292(97.9%)	7%	
Postop Hb (mg/dl)				
9-10.9(170)	13(50%)	157(52.68%)	7.64%	<0.05
7-8.9(129)	10(38.4%)	119(39.93%)	7.75%	
<7(25)	3(11.5%)	22(7.38%)	12%	

Table 3: Association of SSI with type of surgery and duration of surgery

	GROUP A (N=26)	GROUP B (N=298)	Incidence	P value
Type of surgery				
Elective (77)	1(3.9%)	76(25.5%)	1.2%	0.02
Emergency(247)	25(96.1%)	222(74.5%)	10.12%	
Duration of surgery				
<60 min(297)	20(76.9%)	277(92.9%)	6.7%	0.004
>60 min(27)	6(23.7%)	21(7.06%)	22.2%	

Table 4 : Distribution of microorganism in SSI

Micro organism	No. of Cases	%
Staphylococcus aureus	7	26.9
Klebsiella	4	15.3
Acinetobacter	2	7.6
E.coli	2	7.84
No growth	11	42.3
Total	26	100%

Table 4 shows total 4 types of bacteria were isolated from patients of SSI and among which staphylococcus aureus was the most common microorganism in this study. 42.3% patients had no growth in their culture sensitivity report.

DISCUSSION

Surgical site infections (SSIs) are an important global cause of morbidity and mortality in patients undergoing all

types of operations. These infections lead to increased duration of hospitalization, health care costs, morbidity, and risk of death.^[4]

Efforts to reduce maternal mortality and morbidity must focus not only on expanding the quantity and availability of care but also on improving the quality of existing health care.

The purpose of this review was to provide information on reported infection rates following CS. Incidence of SSI in this study is 8.02%. CS rates have been increasing globally, suggesting that the population at risk of SSI following CS in SSA will grow.

The rate of SSI ranges from 3% to 15% worldwide.^[5] The variation in incidence is because of differences in population and risk factors, operative practices, operative duration.^[5]

There is strong evidence of the protective role of antibiotic prophylaxis to reduce the SSI incidence rate.^[11]

Limitation:

1. Sample size and study duration is small. Large multicentric trials will require to validate the data of this study.
2. In this study the follow up of SSI was done up to 7th postoperative day, but patient should be followed up to 30 days of LSCS as per the CDC criteria.

CONCLUSION

- The present study highlights on the incidence of wound infection, possible risk factors and etiology of wound infection.
- Incidence of SSI in this study is 8.02%.
- It was concluded that BMI ≥ 25 kg/m² is associated with increase risk of SSI.
- Diabetes, severe anemia and PROM increases the incidence of SSI.
- Patient having emergency LSCS are having higher risk of SSI compared to elective.
- In SSI Staphylococcus Aureus is most common organism.

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