

Study Of Incidence And Risk Factors In Surgical Site Infections Post LSCS At Tertiary Care Centre In Western Rajasthan

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Abstract

Background: Surgical site infection post LSCS leads to increasing patient morbidity and increase the duration of patient hospitalization, hospital costs and raise the burden on our healthcare system. The incidence of SSI after caesarean section ranges from 3% to 5%. Objective of current investigation was to study the incidence & risk factors responsible for SSI in LSCS. Methods: This prospective study was done among pregnant women undergoing LSCS who developed SSI at department of Obstetrics and Gynaecology in Umaid Hospital, Jodhpur during June 2023 to August 2023. All patients were following up to 7th postoperative day. SSI was defined by CDC criteria. Results: The incidence of SSI noted in present study was 2.5%. Almost 30.8% cases had BMI ≥ 25 kg/m², 55% multipara, 67.3% resided in rural area. Anemia, PROM, LSCS in emergency, multiple vaginal examination (>5), prolonged labor noted in participants of SSI was 51.9%, 26.9%, 75, 34.6%, 38.4% respectively. Silk suture material was used in 71% of cases who developed SSI. Conclusions: Incidence of SSI in present is 2.5%. BMI, Anemia, PROM, LSCS in emergency, multiple vaginal examination (>5), prolonged labor, silk suture material were noted higher among the participants who developed SSI. Keywords: Cesarean delivery, Incidence of SSI, Risk factor, Surgical site infection

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I. Introduction

A caesarean section (CS) is an operation in which incision was made through a mother's abdominal wall and underlying tissues to dislodge the baby[1]. Out of all major abdominal operation, CS is the most common procedure done among women in both developed and developing nations[2]. Multiple adverse events like infection, postpartum haemorrhage, bladder injury and increased risks of scar dehiscence during future pregnancies also noted after CS[3]. Surgical site infection (SSI) following caesarean delivery leads to increasing the duration of patient hospitalization, hospital costs and raise the burden on our healthcare system[4]. Number of caesarean sections have increased over the years and has reached to an approximate of 15% internationally. Incidence of SSI after C section is 3-5% [5]. As per National Family Health Survey reports the trends of C-Section deliveries in India has been on the rise, reaching to 21.5% in 2019-21.

The incidence rate of SSI following CS is associated with many factors like maternal age, hypertensive disorders, types of CS procedures, number of vaginal examinations, high volume of blood loss during surgery, diabetes, maternal weight, surgical techniques and premature rupture of membrane[6-12]. So the present study was conducted to study the incidence and risk factors in SSI post LSCS at a tertiary care centre.

II. Method

This prospective study was done among pregnant women undergoing LSCS who developed surgical site infection at department of Obstetrics & Gynaecology in Umaid Hospital at Dr SNMC Jodhpur during June 2023 to August 2023. Data collection was done after ethical permission from institutional ethical committee and informed consent of clients. Pre-tested questionnaire was administered and details like socio-demographic information, past history of medical illness, menstrual history, obstetrical history, history of previous operation, medical illness was collected. Postoperatively women were monitored for signs of infection. Surgical wound was inspected at the time of first sign of SSI and daily thereafter, till the discharge of patient. All patients were following 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 organism isolated from culture. During the period of study, 2061 C

Sections were done in the hospital out of which 52 cases had developed SSI which amounts for 2.5% of total C-Sections. The data were recorded in an Excel sheet and descriptive analysis was performed, of which data are presented in the tables.

III. Results

During the period of study, 2061 C Sections were done in the hospital out of which 52 cases had developed SSI which amounts for 2.5% of total C-Sections. Out of total 52 cases of SSI 13 cases were operated electively while 39 cases were taken in OT as emergency C-Sections. Number of SSI cases is higher in emergency C-Sections. Out of total 52 cases 18 women had history of C-Section(s) previously also but 34 women never had C-Section before.

The patients who developed SSI, 94.2% of them were of age group <35 years and 67.3% of them were from rural area. Educational status was comparable as 53.8% who developed SSI had completed secondary level education. BMI is also an important factor where almost 30% of patients who developed SSI had a BMI of >25 and 69.2% patients had BMI <25. The patients who developed SSI 44% were primipara and 55% were multipara.

Table No. 1

Distribution Of Sociodemographic Characteristics

Indicators	Number	Percentage	
Age	<35	49	94.2
	>35	3	5.7
Residence	Rural	35	67.3
	Urban	17	32.7
Education	<10th Class	28	53.8
	>10th Class	24	46.2
Bmi	<25	36	69.2
	>25	16	30.8
Parity	Primipara	23	44.3
	Multipara	29	55.7

Risk factors like Anemia(Hb<11), Associated conditions (like GDM, Hypertension,hypothyroidism), PROM, Prolonged labor, Multiple PV exams are common in patients developing post C-Section wound gap. Out of intrinsic risk factors anemia is the most commonly seen in around 51% patients of SSI.

Out of obstetrical risk factors prolonged labor and multiple PV exmas form important risk factors for SSI forming 38.4% and 34.6% cases respectively followed by PROM forming 26.9% cases

Table No.2: Risk Factors In Surgical Site Infections

Factor	Number	Percentage
Intrinsic Factor		
Anemia	27	51.9%
Associated medical condition	13	25%
None	12	23.1%
Extrinsic Factor		
PROM	14	26.9
Prolonged labor	20	38.4
Multiple pv exam	18	34.6

In our study Silk suture was used in 71% cases of SSI and Vicryl suture was used in 29% cases only which clearly shows that silk suture material is more commonly associated with cases of wound infection.

Table No. 3

Suture Material Associated With SSI

Suture Material	Number	Percentage
Silk	37	71.1
Vicryl	15	28.9

IV. Discussion

This study was conducted to analyse the incidence and risk factors in SSI post C-Section of 2061 patients, so incidence of SSI noted in present study is 2.5% which is comparable to 2.66% in a study done on 7923 patients at Nizwa Hospital, Oman[13].Farrat, Dalle and Montario conducted a study in 2015 at Porto Alegre, Brazil in which incidence of SSI post CS was 1.44% [14].In a study done at Bengaluru incidence of SSI was 7.3%.

Mothers who develop SSI, among them majority of women (94%) belonged to age <35 years which is not the usual finding in other studies as in the study population early marriage and early conception is the common trend. In our study 35(67%) of women were residing in rural areas, 21(51.9%) of women had anemia preoperatively. In our study out of total SSI cases 29(55.7%) were multipara which is similar to results found in Bhadauria et al and Rehman et al in their studies, they observed that SSI was more in case of multiparous women. Malnutrition and anemia due to repeated child birth could be the predisposing factors for SSI occurrence in multiparous women. In our study 31% of women had BMI >25 which is comparable with the study done by De D et al[15].

In our study Anemia, Prolonged labor and multiple PV examinations were the most common risk factors. Results were comparable to study conducted by Talukdar et al. and K. Bhavani et al[16]. Preoperative Anemia affects the immune status of female thereby increases the risk of SSI. These findings correlate with the study done by Dessu et al, Amenu et al, Bizimana et al, Chu et al, Karl et al, Callaghan et al[17,18]. Emergency CS is an important risk factor for SSI as it is associated with 75% cases of LSCS in our study.

In present study Silk interrupted sutures were used in skin closure in 37 (71%) of total cases who developed SSI as compared to 28% of cases of SSI who used vicryl. Johnson et al. reported a higher rate of infection when skin closed with interrupted sutures or staples when compared with subcuticular sutures. A study conducted by Henry –Stanley et al provided some established results that black silk has preferential bacterial adherence as compared to monofilament/absorbable sutures. Our study seconds this finding. Thus this is visible from the various other studies that silk is more associated with SSI post CS.

V. Conclusion

The present study highlights on the incidence of wound infection, possible risk factors for SSI and etiology of wound infection. This study was done to analyse incidence and risk factors in SSI post LSCS at tertiary care centre. Surgical Site Infections (SSI) following C-Section are noted in 2.5% of cases. It was concluded from this study that patients from rural area, anemia, presence of PROM, multiple vaginal examination, silk suture material is associated with development of SSI. It was evident from present study that patients having emergency LSCS have had more chance of SSI. Patients having emergency LSCS and having any risk factor mention above have had increased chances of SSI. Women having Anemia and associated conditions like GDM or Hypertension are more likely to develop SSI. SSI is a major cause of burden on healthcare system in terms of the morbidity and economic costs. Reduction in incidence of SSI can be achieved by improving the nutrition of pregnant women, correction of anemia, proper preoperative care specially before emergency CS, and proper perioperative antibiotic usage. It was concluded from this study that skin closure with braided suture like silk is noted in majority of SSI cases. Thus a check is needed on skin closure suture material.

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