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INCIDENCE AND RISK FACTORS OF SURGICAL SITE INFECTION FOLLOWING CAESAREAN SECTION IN A PROVINCIAL HOSPITAL

Gynecology

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ABSTRACT

Introduction: Over the last 20 years, the increase in caesarean section(CS) delivery has been substantial in many states in the country. Morbidity after a CS is increased considerably once there is surgical site infection (SSI) and it may lead on to mortality. Medical science is able to reduce this problem of SSI by adherence to strict aseptic measures. How much we could achieve %? What is the correct burden of the problem and how can we further reduce it?

Objective: To identify the incidence of SSI after CS and to identify the risk factors of SSI after CS.

Material And Methods: it was a descriptive study conducted in the department of obstetrics and gynaecology, Government hospital, Gandhi Nagar, Jammu. It is a provincial hospital. Study was done on women who had undergone caesarean section.

Result: 4.88% of subjects had SSI, the significant factors in the final model included were emergency CS, interrupted skin suturing and rupture of membrane before CS.

Conclusion: Rate and several risk factors of post CS SSI were studied to increase the public alertness, and to take full steps to decrease it prophylactically.

KEYWORDS

Caesarean Section, Surgical Site Infection, Incidence, Risk Factors.

INTRODUCTION

Caesarean section (CS) is among the most frequent surgical interventions in women all over the world (1, 2).

Caesarean section rates have been on the rise in recent years, with the suggested increase in C- section rates, there is also increased incidence of surgical site infection in LSCS (3).

Surgical site infection (SSI) is considered as one of the most common health care associated infections especially in low and middle-income countries (4, 5).

Despite recent surgical parameters and antibiotic prophylaxis SSI is still standing significantly behind morbidity, mortality and healthcare-associated costs, especially if we know that CS increases the risk of postpartum infections by five to even twenty-fold compared to usual or vaginal delivery (6, 7).

The SSI following CS causes physical, psychological and financial burden to the lady, her family and community.

Obstetrical surgery involves some degree of contamination, and is classified as "clean- contaminated" cases, even when the patient has no preoperative signs and symptoms of active infection. So, pregnant women are at risk of infection during delivery, which may be enhanced by the relative immunocompromised state of pregnancy (8).

AIMS & OBJECTIVES

To find out the incidence and associated risk factor of SSI after CS at Govt. hospital, Gandhi Nagar Jammu, which may have an impact on increasing alertness among obstetricians aiming to prevent such a problem.

METHODS

This study was conducted in the department of Obstetrics and Gynaecology, Government hospital, Gandhi Nagar Jammu, from the July 2017 to December 2017.

A total number of 614 women who had undergone CS as a mode of delivery were enrolled, with patients who had exploratory laparotomy after lower segment CS were excluded. All the patients were given hospital supplied injectable antibiotics for 3days which are injection ceftriaxone 1gm twice a day, injection tinidazole and injection gentamycin thrice a day. Afterwards they were given oral antibiotics that is tablet cefixime 200mg twice a day for 5 days.

Medical history and examination were done for all patients by the attending obstetrician, with wound examination for the development of SSI when women got back for stitch removal around eight days post- operatively.

For each confirmed case of SSI, two randomly selected cases with no SSI (from the same total sample of patients within study period) were considered as a control to compare and identify any associated risk factor with SSI. Also for each patient either in diseased or control group; there had been some specific information collected such as age, parity, CS type (emergency or elective), academic level (according to literacy), history of smoking, occupation, and level of haematocrit (as anaemic was considered when haematocrit (PCV) was less than 30% immediately before surgery (9).

Fasting blood sugar measurement were documented at time of CS and diabetes mellitus was diagnosed when it exceeded 105mg/dl (10).

Regarding (SSI), all types were involved in the study which include (12):

Superficial SSI: infection involves just skin or underlying subcutaneous tissue that was managed in a conservative way by daily dressing and appropriate antibiotics.

Deep incisional SSI: infection involves deep tissue (like fascial and muscle layer) or presence of wound dehiscence which needed secondary suturing.

Organ/space SSI: infection involves any part of anatomy (e.g. organs or spaces) apart from the incision, which was manipulated during an operation that required exploration and suturing. Statistical analysis was accomplished using independent t- test and chi- square test, with P value of <0.05 was considered as statistical significant.

RESULT

Out of 614 women involved, 30(4.88%) of them had SSI, which represents the incidence rate of SSI post CS in our setting.

Table 1 shows general characteristics of case-group (patient with SSI) and control group (with no SSI), where we had no statistically significant difference for all variables. These risk factors (variables) included age of pregnant mother, parity, smoking behaviour, education status (literates or non-literates) and main work or duty that these ladies whom entered into this study had for living or daily practices.

Emergency CS, members rupture before delivery, and type of skin suturing, played an important statistically significant role being risk factors to develop SSI as detailed in table 2.

There was no statistically significant difference in two groups with regard to anaemia and diabetes as mentioned in table 3.

Table 1: General clinical, social, and demographic features for cases and controls.

Variable	Case (n=30)	Control (n=60)	P value
Age, mean SD	26.53±4.13	26.55±3.29	0.4917
Parity, means SD	1.63±0.76	1.73±0.66	0.2612
Smoking status, n (%) Smoker Non-smoker	 2(6.6%) 28(93.33%)	 10(16.66%) 50(83.33%)	0.1883
Academic level, n (%) Literate Illiterate	 28(93.33%) 2(6.66%)	 55(91.66%) 5(8.33%)	0.7807
Occupation: Housewife Employed	20(66.66%) 10(33.33%)	35(58.33%) 25(41.66%)	0.4445

Table 2: Operation-related risk factors for cases and controls

Risk factor	Case (n=30)	Control (n=60)	P value
Types of CS, n (%) Emergency Elective	 25(83.33%) 5(16.66%)	 28(46.66%) 32(53.33%)	0.0008
Types of incision, (n%) Vertical Horizontal	 4(13.33%) 26(86.66%)	 10(16.66%) 50(83.33%)	0.6808
Types of skin suturing: Interrupted Subcuticular	 26(86.66%) 4(13.33%)	 22(36.66%) 38(63.33%)	0.00001
Rupture of membranes before CS: Yes No	 23(76.66%) 7(23.33%)	 13(21.68%) 47(78.33%)	0.00001

Table 3: Laboratory parameters for cases and control

Parameter (disease)	Case (n=30)	Control (n=60)	P value
Diabetes mellitus	5(16.66%)	3(5%)	0.06674
Anaemia	10(33.33%)	20(33.33%)	1

4. DISCUSSION

Caesarean section (CS) is one of the commonest and most famous surgeries in obstetrics. Surgical site infections (SSI) rises maternal morbidity, elongate hospital admission, and have a direct effect on healthcare cost [3].

The rate of SSI related to CS in our data was 4.88%, which is considered low in comparison to other parts of the globe, like in Norway (8.3%) [12], UK (9.6%) [13], and (17%) in Australia [14]. While in India; it was 7.4% which was slightly higher than this study. [15] Incidence of SSI in our study is comparable to Vijayan et al which also reported incidence of SSI post CS to be 4.1% [16]. Post discharge surveillance was not done and it may have contributed to the low rate of SSI in the present study.

Variable risk factors of post caesarean section surgical site infection were investigated within this study, revealing the following significant risk factors: emergency CS, interrupted sutures, rupture of membranes before CS and diabetes mellitus.

Emergency CS has been linked to SSI through more frequent vaginal examinations with greater opportunity for membranes to rupture before delivery, highly urgent operation, less concerns about sterility, and absence of prophylactic antibiotics on time [17, 18].

Some authors found type of CS (either emergency or elective) was not a significant risk factor of SSI [9].

In our study, we did not find significant difference in incidence of SSI in 2 groups of incision of CS i.e. vertical and horizontal. But some studies found that vertical incision of CS increase the risk of SSI [19].

In our study, we found that interrupted suturing was a good predictor of SSI, when compared to a subcuticular technique which had lower infection rates. The difference in incidence of SSI in 2 groups was found to be significant with a P value of 0.00001.

The rupture of membranes before CS was attributed to SSI risk factors. An infected amniotic fluid may transfer pathogens into CS incisions with chorioamnionitis could be a final result. [20]

In this study, we did not find any significant association between post CS SSI and diabetic mothers. Some reporters also showed no real relation with diabetes in spite of some increase in incidence of SSI after CS. [21]

Anaemia at time of CS in these series did not significantly affect SSI rates, in favour of other publishes. [14]

Some studies found a trend of Post CS SSI towards following risk factors: younger age group, and less parity or even nulliparity but in our study, we did not found any significant association of these factors with SSI [22]. In our study, we could not follow up all patients completely due to lack of an effective follow up screening method for SSI after CS. Other potential risk factors such as amount of blood loss, number of vaginal examinations before CS, duration of caesarean operation, and an elapsed time before surgery since rupture of membranes, were not measured during this study because of unavailability of sufficient resources within a medical facility. All these could be considered as weak aspects of this study.

5. CONCLUSION

Standing on the most important points to identify risk factors of SSI after CS, with its incidence rate, would lead obstetricians to pay more attention during daily practice, and paving a roadmap to prevent or decrease the rate of these infections, especially in low socioeconomic societies where it is hard to identify post CS SSI and even to treat it.

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