

SURGICAL SITE INFECTIONS AMONG PATIENTS UNDERGOING ELECTIVE VERSUS EMERGENCY CAESAREAN SECTION

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ABSTRACT

Objective: To determine the risk factors for surgical site infection in women undergoing lower segment caesarean section and to compare the frequency of identified risk factors for surgical site infection among women undergoing elective and emergency caesarean section.

Methodology: It was a cross-sectional comparative study, conducted at Hayatabad Medical Complex Peshawar from August 2014 to August 2015. Consecutive 195 post operative cases of emergency and elective caesarean section with surgical site infection were enrolled into the study. The patients were followed on the 3rd to 5th post-operative day and on 28th day thereafter. Final outcome i.e. surgical site infections (SSI) was measured on 28th day by researcher and SSI were labeled as positive, as per operational definition.

Results: A total of 195 post-operative cases diagnosed with surgical site infection, were studied during the specified period. Of these 164(84.1%) were delivered with emergency caesarean section whereas 31(15.9%) by elective caesarean section. Average age of the patients was recorded 27.8 ± 7.7 (ranging from 21 to 40) years, average parity of the women was recorded 4.4 ± 1.6 (range 0-9), average gestational age of the women was recorded 38 ± 1.3 (ranging from 37 to 40) weeks. Average BMI of the patients was recorded 29.3 ± 4.6 (ranging from 20 to 45). In this study BMI of more than 35 kg/m^2 was associated with higher rate of SSI.

Conclusion: Obesity, gestational age, educational and economic status are risk factors for surgical site infections; more so following emergency vs elective caesarean sections.

Key Words: Surgical site infections, Lower segment Caesarean Section

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INTRODUCTION

Delivery of the baby by an abdominal and uterine incision is known as caesarean section. It is one of the most common obstetrical operations and incidence of maternal post operative complications varies in literature¹. Nowadays it accounts for 24% of all births in England². Women undergoing caesarean delivery have significant incidence of many infectious complications including fever, wound infection, endometritis, bacteraemia, urinary tract infection and pelvic abscess³.

Post operative infection at the surgical sites in the

obstetrics and gynaecological procedures are very common in third world countries as the state of health of many women is below the optimum level, i.e hemoglobin, nutritional status and multiparity⁴. Continuously evolving practice of modern surgery has changed the nature of post operative management⁷. Wound infection is the commonest and most troublesome disorder of wound healing and despite modern surgical techniques and the use of antibiotics prophylaxis, surgical site infections (SSI) remains a major contributory factor of maternal morbidity and mortality⁸.

The risk factors for surgical site infections (SSI) after

caesarean section are many; these include intrinsic and extrinsic risk factors that predispose patients to SSI. Intrinsic factors are patient related while extrinsic factors are related to patient care and management, although the intrinsic factors cannot be changed, the risk they present in terms of infection is identifiable and manageable⁶.

Immense body of literature might be existing about SSI but this study is conducted in a tertiary care hospital serving a large obstetric population. This center deals with complicated cases belonging to low socioeconomic class. So this study is aimed to be helpful in designing the achievable preventive measures to decrease the economic burden on patients, hospital and country.

The rationale of this study was to find out the magnitude of SSI following LSCS and associated risk factors. Obtained data can be utilized to design strategies helpful in minimizing the extrinsic risk factors observed in this health institute and hence decreasing the morbidity. Achievable preventive measures could be taken to save the economic burden on patient, hospital and community as a whole.

METHODOLOGY

It was a cross-sectional comparative study, conducted in the Department of Obstetrics and Gynaecology, Hayatabad Medical Complex Peshawar from August, 2014 to August 2015. Sample size was calculated by WHO sample size calculator with 95% confidence interval and 5% margin of error of estimation. Consecutive 195 post operative cases of caesarean delivery with surgical site infection were included.

The inclusion criteria of the study was: women between 20-40 years of age who underwent caesarean for singleton pregnancy at term gestation (37- 40weeks) and consented to participate in the study. Cases operated on elective and emergency list were included. Patients with diagnosed psychological illnesses, neurological deficits, caesarean done for multiple gestation, diabetic mothers, patients operated somewhere else and got admitted for post operative care were excluded from the study.

The study was conducted after the approval from ethical review committee of the institute. Only 4th year resident performed the surgery. The patients were followed on the 3rd to 5th post-operative day and then at the end of 4th week. Final outcome of SSI was measured at 28th day and SSI was labeled as positive, as per op-

erational definition. The data was entered and analyzed using statistical package for social sciences (SPSS) version 10 for analysis. Mean and standard deviation was calculated for quantitative variables like age of patient, gestational age. Frequency was calculated for the SSI.

Chi square test was applied to compare SSI in emergency and elective LSCS. Factors including gestational age, obesity, educational status, economical status, family monthly income were evaluated as risk factors and stratified to see the effect of these on outcome through chi-square and p-value of <0.05 was considered significant.

RESULTS

With a rate of 25% caesarian sections (C-section) in our unit, a total of 2127 women underwent the procedure. Of these, about 72.9%(n=1551) were performed in emergency and 27.1%(576) undertaken on elective list. A total of 195 post operative cases diagnosed with surgical site infection were studied during the specified period. Of these 164(84.1%) were delivered with emergency C-section and 31 (15.9%) by elective caesarean sections. In this study 78% emergency caesarian sections were done on patients who were unbooked and 22% were performed on booked patients. Average age of the patients was recorded as 27.8 ± 7.7 (ranging from 21 to 40) years, average parity of the women was recorded as 4.4 ± 1.6 (ranging from 0 to 09), average gestational age of the women was 38 ± 1.3 (ranging from 37 to 40) years. Average BMI of the patients was 29.3 ± 4.6 (ranging from 20 to 45).

Regarding age distribution, it was observed that the group having largest number of subjects was between 21-35 years (51.8%) and included 101 patients. When the gestational age was classified by four weeks interval from 37 weeks to 40 weeks, it was observed that the number of subjects were almost equal in all classes. The group having largest number of subjects was observed in <38 weeks of gestation. Out of 195 patients 55(28.2%) were illiterate, 79 (40.5%) were middle, 31 (15.9%) were matric, 20 (10.2%) were intermediate and 10 (5.2%) took graduate education.

The distribution of monthly income of women undergone C-section is shown in table 2. 96 (49.3%) belong to poor class, 78(40%) belong to middle class and only 21(10.7%) belong to upper middle class. Out of 195 patients, 94 (48%) patients was having body mass index of more than 25. Stratification of the variables like gestation age, obesity, education status & monthly income status was found statistically significant at 95% confidence interval with p-value found less than 0.05, as shown in table 2.

Table 1: Basic characteristics of patients (n=195)

Age	27.8±7.7
Parity	4.4±1.6
Gestational Age	38±1.3
BMI	29.3±4.6
Emergency Caesarian Sections	164(84.1%)
Elective Caesarian Sections	31(15.9%)
Poor Class	96(49.3%)
Middle Class	78(40%)
Upper Middle Class	21(10.7%)
Illiterate	55(28.2%)
Middle Pass	79(40.5%)
Matric	31(15.9%)
Intermediate	19(9.7%)
Graduate	11(5.6%)

Table 2: Comparison of different variables with SSI

Variables	Elective Caesarian Section	Emergency Caesarian Section	P value
Total No. of patients	31 (15.9%)	164(84.1%)	
BMI <20	4(2.1%)	32(16.4%)	0.043
BMI 20-25	7(3.6%)	87(44.6%)	
BMI >25	20(10.3%)	45(23.1%)	
Illiterate	10(5.1%)	45(23.1%)	0.00
Middle Pass	8(4.1%)	71(36.4%)	
Matric	3(1.5%)	28(14.4%)	
Intermediate	4(2.1%)	15(7.7%)	
Graduate	6(3.1%)	5(2.6%)	
Poor Class: Income <20,000 Rs.	16(8.2%)	80(41%)	0.003
Middle Class: 20-50,000 Rs.	8(4.1%)	70(35.9%)	
Upper Middle Class:>50,000 Rs.	7(3.6%)	14(7.2%)	
Gestation ≤38weeks	22(11.3%)	83(42.6%)	0.036
>38 weeks	9(4%)	81(41.5%)	
Total	31(15.9%)	164(84.1%)	

DISCUSSION

Caesarean section being performed with increased frequency, there's the perception to regard it as an uncomplicated and straight forward procedure but complications do occur causing significant morbidity and mortality.

SSI is the second most common infectious complication after UTI following caesarean delivery⁵. For the majority of obstetric patients, it rarely represents a threat to life. However, there are far reaching morbidity and socioeconomic consequences for the health care ser-

vices⁶.

Success of operation depends upon a proper preoperative care. Risk reduction is the goal of well designed plan for preoperative management and care of patient undergoing obstetric surgery. To be most effective, the planning begins with an appropriate preoperative evaluation and continues with optimal intra-operative decision making and technique and care during post operative periods. These care plans are particularly important for patients with repeat caesarean section.

This study shows that the maternal morbidity and

mortality increases with emergency caesarean section when compared with elective caesarean section which is also supported by different studies as quoted in literature^{9,10}.

In current study 78% emergency caesarean sections were done in patients who were unbooked and 22% of emergency caesarean sections were done in booked patients. The results of this study are comparable with the one carried out in Nishtar Hospital, showing 74% caesarean section rate in unbooked cases. This is of the fact that majority of pregnant women deliver vaginally at home by traditional birth attendants (TBAs), lady health visitors and general practitioners in private hospital. Referred patients in emergency to this hospital are those who have one or other risk factors and who are already had trial of labour¹¹. Obesity is known to be a well established risk factor for SSI. In this study BMI of more than 25kg/m² was associated with higher rate of SSI.

A study was done by Opoien et al¹ in Norway in 2007, to document incidence of post-caesarean surgical site infection according to the definition of US Centers for Disease Control and Prevention (CDC), the total rate of surgical site infection was 8.9%. There was no significant difference in SSI rate in elective and emergency caesarean sections.

The incidence of wound infection after caesarean section has been quoted 1-9%. In our study 9.2% of caesarean sections had wound infection. When we look for indication of caesarean section, 7.71% occurred in emergency as against 1.45% following elective caesarean sections. 18.5% patients were uncomplicated as they were timely referred from either other hospitals or clinics while 14% were mishandled by TBAs and in these circumstances there was chorioamnionitis and vaginal examinations without any septic technique.

In a study by Rehu and Nielsson¹⁶ they found higher risk of wound infection with prolong rupture of membrane and prolong labour and with an inexperienced surgeon. The risk is also directly proportional to the number of vaginal examinations performed (Hawrylyshyn et al-1981)¹⁶.

CONCLUSION

Educational and economic status, obesity and gestational age are risk factors for surgical site infections following caesarean sections. Maternal morbidity, however, following elective caesarean section is lesser than emergency caesarean section.

RECOMMENDATIONS

As emergency caesarean sections occurred mostly in unbooked patients, it is recommended that women

should be encouraged for preconceptional counselling and antenatal booking in order to control the modifiable risk factors like obesity and to decrease the incidence of emergency caesarean section.

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CONTRIBUTORS

NK conceived the idea, planned the study, and drafted the manuscript. SA and SA helped acquisition of data. NH searched the literature and did statistical analysis. All authors contributed significantly to the submitted manuscript.