



SOCIODEMOGRAPHIC PROFILE OF WOMEN WITH SURGICAL SITE INFECTION AFTER CAESAREAN SECTION

Community Medicine

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ABSTRACT

Surgical site infection (SSI) following caesarean section can adversely influence the postpartum period for the women. The objective was to study the Sociodemographic Profile Of Women With Surgical Site Infection After Caesarean Section. 450 women undergoing caesarean section were followed for any SSI. The sociodemographic profile of women with SSI were compared with those who did not develop SSI. 11.11% had SSI. Women in age group 26-30 years, those from rural background, lower socio-economic status, obese women, tobacco users had higher odds ratio and hence were at higher risk of developing SSI. Modifications done in these may help reduce SSI.

KEYWORDS

Body mass index, literacy, residence, surgical site infection

INTRODUCTION

Caesarean sections (CS) are performed on women of varied clinical profile, of different backgrounds, varying habits and in different setup: from low cost, low resource setting to expensive setups with ideal infrastructure. Caesarean section carries risk of short-term postoperative complications such as pain, haemorrhage and wound infection. Caesarean delivery is the single most important risk factor for postpartum infection. Compared to women delivered vaginally, those delivered by caesarean classically face a 5 to 20-fold increase in risk.¹ The most common post-caesarean infection is SSI (wound infection) and infection of the urinary tract. The objective of the study was to study the sociodemographic profile of women with SSI after caesarean section.

METHOD

The study was conducted on 450 women undergoing caesarean section, selected amongst women admitted in labour ward, after applying the inclusion and exclusion criteria. After a detailed history, caesarean section was performed of all selected women. Based on the presence or absence of postoperative SSI, they were categorised in two groups. The socio-demographic profile of women with SSI were compared with those who did not develop SSI.

RESULTS

Fifty women out of 450 had SSI (11.11%). Various socio-demographic factors for SSI were analysed and conclusions drawn.

The overall mean age was 25.29 years with range of 18-30 years. The mean age of women with SSI was 26 years and mean age of women with no SSI was 24.59 years. 76.66% women were >22 years. Women in age group 26-30 years were at higher risk of developing SSI (odds ratio=5.00) as compared with women in 22-26 years age group (odds ratio=2.27). Higher maternal age was a statistically significant risk factor for developing SSI (p=0.001). 47.55% women in both groups were educated higher than secondary level. Women who were educated upto secondary level had the highest odds ratio for SSI (1.12). Table 1.

Table 1. Maternal Age and Education Status Of Women With SSI

RISK FACTOR		Women with SSI (n=50)	Women with No SSI (n=400)	Adjusted odds ratio (AOR)	
Age (year)	18-22	5(4.8%)	100(95.2%)	1	Chi-square = 12.49 with degree of freedom = 2, p = 0.001 (S)
	22-26	25(10.2%)	220(89.8%)	2.27 (0.84-6.11)	
	26-30	20(20%)	80(80%)	5.00 (1.79-13.91)	
Literacy status	Upto Pr.	8(8.8%)	83(91.2%)	0.7631 (0.32-1.76)	Chi-square = 0.747 with degree of freedom = 2 p = 0.688 (NS)
	Upto Sec.	18(12.4%)	127(87.6%)	1.122 (0.58-2.15)	
	>Sec.	24(11.2%)	190(89.8%)	1	

All women belonged to lower and middle socioeconomic class. There were very few women were from the higher socioeconomic class. Women from lower socioeconomic status showed higher odds ratio (1.20) for SSI. Table 2.

Most women were from the urban area (59.55%) since the hospital is situated in the centre of the city and is easily approachable for the population. As compared to women from semiurban area, women from rural areas were at higher risk of SSI (odds ratio=1.40). These women did not obtain adequate antenatal care and this could have led to higher risk to SSI in them. Though in our study, no significant association found between maternal residence and SSI (p=0.528). Table 2.

Table 2. Socioeconomic and Residential Status Of Women With SSI

RISK FACTOR		Women with SSI (n=50)	Women with no SSI (n=400)	Odds ratio (OR)	
Socioeconomic status	Lower	17 (12.4%)	120 (87.6%)	1.20 (0.64-2.24)	Chi-square = 0.336 with degree of freedom = 1, p = 0.562 (NS)
	Middle	33 (10.5%)	280 (89.5%)	1	
Residence	Rural	15 (14.0%)	92 (86.0%)	1.40 (0.71-2.74)	Chi-square = 1.275 with degree of freedom = 2 p = 0.528 (NS)
	Semi urban	7 (9.3%)	68 (90.7%)	0.88 (0.37-2.11)	
	Urban	28 (10.5%)	240 (89.5%)	1	

In our study, most women (61.11%) had BMI in range of 18.5-24.9 kg/m². 66% of women with SSI had BMI > 25 whereas, only 35.5% women with no SSI had BMI > 25. As the BMI increased, the risk of SSI in terms of odds ratio increased, from 3.06 in those with BMI 25-29.9 to 25.29 in those with BMI ≥ 30. BMI was a statistically highly significant associated risk factor for SSI Table 3.

Table 3. Association of Surgical Site Infection with Body Mass Index

BMI (kg/m ²)	Women with SSI (n=50)	Women with no SSI (n=400)	Adjusted odds ratio (AOR)	
18.5-24.9	17(6.2%)	258(93.8%)	1	Chi-square = 33.56 with degree of freedom = 2 p = 0.0001 (S)
25-29.9	28(16.8%)	139(83.2%)	3.06 (1.62-5.78)	
>30	5(62.5%)	3(37.5%)	25.29 (5.57-114.87)	

In our study most of the women (93.11%) had no history of smoking, tobacco chewing or alcohol intake. Among women with SSI, 16% had habit of tobacco chewing or smoking as compared to ~6% in women with no SSI. Women with history of tobacco chewing had lower odds ratio (1.22) compared with women having history of smoking (44.88). So in this study, smoking was found a statistically highly significant associated risk factor for SSI (p=0.0001).

DISCUSSION

Majority of the women (more than 80%) in both groups belonged to 20-30 years age. The average age of marriage in India is 21.2 years, hence most women were of 20-29 years age. (Census 2011).²

Wloch C et al (2012)³ found higher rate of SSI in women < 20 years and women over 45 years compared with the 25–30 year age group. Chhetry M et al (2017)⁴ also found younger age as one of the factors for SSI whereas Zejnnullahu et al (2019)⁵ observed that age less than 35 years reduced the chance for SSI as compared to the older women. Repeated pregnancies and small inter-pregnancy interval leading to anaemia may be cofactors in older women.

Vallejo MC et al (2018)⁶ found greater SSI in women with lower education level. The reason for greater SSI may be due to early brisk ambulation and due to stressful conditions in working women.

Gedefaw G et al (2019)⁷ also found that poor socioeconomic status was a major risk factor for postoperative infections, as it is often associated with lower education level, poor hygienic conditions, non availability of proper nutrition, non use of clean sanitary napkins, hence, there is higher infection rate in their environment. These women often do not attend medical facilities because of loss of wages etc. Where Janani Shishu Suraksha Karyakram⁸ is not available, there may be more chances of SSI.

Though according to Census 2011 in Rajasthan 75.18% population live in rural area.² Our study population reflects the urban women of the area the hospital caters to. The rural ladies generally go to the primary health center of their area for routine antenatal check-ups. Vallejo MC et al (2018)⁶, Demisew A et al (2011)⁹ found that there was greater risk of SSI in rural populations.

Women belonging to rural area may experience significant health disparities when compared to the general population. Rural women may be from a lower socioeconomic status or lower education level, with poor health status, may have limitations in physical activity, a higher incidence of disability, may have higher rates of chronic illness or have higher rates of health risk behaviours, have poor overall health and increased mortality rates, lower life expectancies than urban residents, and have marked disparities in availing health care.⁶

Women from rural areas developed more severe type of infections (deep or organ/space) than those from urban areas, as most of them presented late with prolonged labour and associated chorioamnionitis.⁹ Meenu Beniwal et al (2020)¹⁰ observed that body mass index (BMI) >27kg/m² was a risk factor for SSI. Obesity was also a surrogate for other known risk factors for SSI, namely diabetes mellitus.

Novelia S et al (2017)¹¹ in their study found that poor nutrition and limited mobility were the co-factors found in obese women undergoing caesarean section. Obese patients have tissue hypoperfusion which predispose to greater risk of ischaemia, necrosis, and suboptimal neutrophil oxidative killing, leading to the risk of SSI. In addition, operations on patients who were obese could be more complex and prolonged and prolonged procedure itself was an independent risk factor for SSI.⁶ Women with obesity have limited mobility, which might disturb blood circulation and thus influence the wound healing process.

Meenu Beniwal et al (2020)¹⁰ found the incidence of SSI in chronic smokers (16.67%) to be 2.5 times higher than in non-smokers (7.31%). Raj Shree et al (2016)¹² also analysed that tobacco use during pregnancy was a modifiable risk factor and that it could be addressed with prenatal counseling and intervention.

The proposed aetiology is related to vasoconstriction of vessels in the surgical bed that leads to tissue hypovolemia and hypoxia. Poor tissue perfusion impedes transport of nutrients and alters the immune response. Current smokers were at the highest risk for SSI and former smokers were at higher risk than an individual who had never smoked.¹⁰

CONCLUSION

The magnitude of surgical site infection following caesarean section was low compared to previous studies. The independent associated socio-demographic factors for SSI after caesarean section were young age, lower socio-economic status, women from rural area, obesity and smoking. In addition to ensuring sterile environment, decreasing weight and stopping smoking would appear to be very important interventions to reduce it.

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