

ORIGINAL ARTICLE

Assessment of surgical site infection (SSI) in patients undergoing caesarean section

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ABSTRACT:

Background: In contemporary obstetrics, one of the most prevalent surgical procedures is the cesarean section (C-section). The present study was conducted to assess surgical site infection (SSI) in patients undergoing caesarean section. **Materials & Methods:** 86 patients who underwent caesarean section were recruited. The risk factors for SSI were recorded. **Results:** Out of 58 patients who underwent elective LSCS, 3 had SSI and out of 28 patients who underwent emergency LSCS, 2 had SSI. Risk factors were anaemia in 2, hematoma in 1, blood transfusion in 1 and obesity in 1 case. Duration of surgery was <1 hours in 2 and >1 hour in 3 patients. Clinical features were fever in 5, local pain and induration in 2 patients, wound deliberately opened in 1, purulent discharge wound in 3 patients. Pus culture and sensitivity showed E. coli in 2, MRSA in 1, MRCON in 1 and sterile in 1 case. Management included conservative in 4 and re-suturing in 1 case. The difference was significant (P<0.05). **Conclusion:** Risk factors were anaemia, hematoma, blood transfusion and obesity.

Keywords: cesarean section, Erythema, Surgical site infections

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INTRODUCTION

In contemporary obstetrics, one of the most prevalent surgical procedures is the cesarean section (C-section). The number of women with postpartum infections is predicted to climb as a result of the ongoing global increase in the incidence of cesarean sections.¹ Surgical site infections (SSIs) are infections that occur at or near the surgical incision within 30 days of an operation or within one year if an implant is placed. SSIs are among the most common complications following surgery and can significantly impact patient recovery, leading to increased morbidity, prolonged hospital stays, and higher healthcare costs.^{2,3}

Erythema and induration of the incision are signs of wound infection, which often appear four to seven days following the cesarean section. Usually, groups A or beta-hemolytic streptococcus are the culprits when the wound infection appears within 48 hours.⁴ Escherichia coli, Proteus mirabilis, Ureaplasma urealyticum, Staphylococcus epidermidis, Enterococcus faecalis, and Staphylococcus aureus are some prevalent organisms that interfere in wound infections.⁵ Prophylactic antibiotic use during cesarean section significantly decreased the risk of fever,

endometritis, wound infection, urinary tract infection, and major infection episodes following the procedure.⁶ The present study was conducted to assess surgical site infection (SSI) in patients undergoing caesarean section.

MATERIALS & METHODS

The present study was conducted on 86 patients with underwent caesarean section. All were informed regarding the study and their written consent was obtained.

Data such as name, age, etc. was recorded. All patients who underwent lower segment caesarean section received a single dose of prophylactic antibiotic in the form of Inj. Cefotaxime 1 gm half an hour prior to surgery. The wound infections, any organisms grown in the cultures, the drug sensitivity of those organisms as well as the risk factors contributing to infections, like obesity, premature rupture of the membranes (PROM), prolonged labour and comorbid medical conditions like diabetes, hypertension and anemia were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Assessment of SSI

Type of LSCS	Number	SSI
Elective	58	3
Emergency	28	2

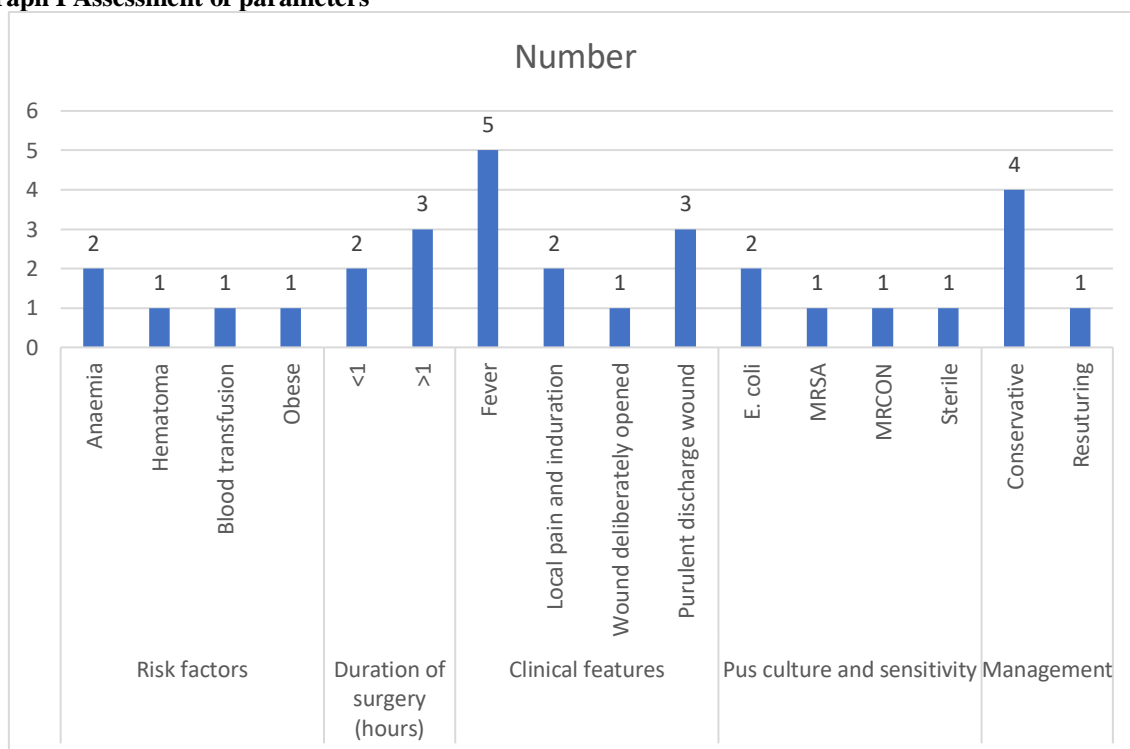
Table I shows that out of 58 patients who underwent elective LSCS, 3 had SSI and out of 28 patients who underwent emergency LSCS, 2 had SSI.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Risk factors	Anaemia	2	0.18
	Hematoma	1	
	Blood transfusion	1	
	Obese	1	
Duration of surgery (hours)	<1	2	0.95
	>1	3	
Clinical features	Fever	5	0.05
	Local pain and induration	2	
	Wound deliberately opened	1	
	Purulent discharge wound	3	
Pus culture and sensitivity	E. coli	2	0.14
	MRSA	1	
	MRCON	1	
	Sterile	1	
Management	Conservative	4	0.03
	Resuturing	1	

Table II shows that risk factors were anaemia in 2, hematoma in 1, blood transfusion in 1 and obesity in 1 case. Duration of surgery was <1hours in 2 and >1hour in 3 patients. Clinical features were fever in 5, local pain and induration in 2 patients, wound deliberately opened in 1, purulent discharge wound in 3 patients. Pus culture and sensitivity showed E. coli in 2, MRSA in 1, MRCON in 1 and sterile in 1 case. Management included conservative in 4 and re-suturing in 1 case. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

After a cesarean delivery, surgical site infections (SSIs) are a leading cause of morbidity and mortality. They also lengthen hospital stays for patients and raise hospital expenses, which puts more strain on our health care system.^{7,8} SSI rates following cesarean delivery vary from 3% to 5%, depending on the population under study, the techniques employed for case detection and monitoring, and the application of

suitable antibiotic prophylaxis.^{9,10} The present study was conducted to assess surgical site infection (SSI) in patients undergoing caesarean section. We found that out of 58 patients who underwent elective LSCS, 3 had SSI and out of 28 patients who underwent emergency LSCS, 2 had SSI. Killian et al¹¹ identified risk factors associated with surgical-site infections (SSIs) following cesarean sections. Prospective surgical-site surveillance was conducted

using methodology of the National Nosocomial Infections Surveillance System. Multiple logistic-regression analysis identified four factors independently associated with an increased risk of SSI following cesarean section: absence of antibiotic prophylaxis (odds ratio [OR], 2.63; 95% confidence interval [CI95], 1.50-4.6; $P=0.008$); surgery time (OR, 1.01; CI95, 1.00-1.02; $P=0.04$); <7 prenatal visits (OR, 3.99; CI95, 1.74-9.15; $P=0.001$); and hours of ruptured membranes (OR, 1.02; CI95, 1.01-1.03; $P=0.04$). Patients given antibiotic prophylaxis had significantly lower infection rates than patients who did not receive antibiotic prophylaxis ($P=0.02$), whether or not active labor or ruptured membranes were present.

We observed that risk factors were anaemia in 2, hematoma in 1, blood transfusion in 1 and obesity in 1 case. Duration of surgery was <1 hours in 2 and >1 hour in 3 patients. Clinical features were fever in 5, local pain and induration in 2 patients, wound deliberately opened in 1, purulent discharge wound in 3 patients. Pus culture and sensitivity showed *E. coli* in 2, MRSA in 1, MRCON in 1 and sterile in 1 case. Management included conservative in 4 and re-suturing in 1 case. Martens et al¹² in their study 2,431 patients were followed after cesarean delivery with prompt evaluation and culture of all suspicious wounds. Seventy subjects (2.8%) developed confirmed wound infection, and 42 (1.7%) developed noninfected open surgical wounds. Seven (0.3%) fascial dehiscences were diagnosed, requiring surgical repair. Forty of 63 (64%) infected wounds had positive bacterial cultures, with *Staphylococcus epidermidis* (29%), *Enterococcus faecalis* (17%), *Staphylococcus aureus* (17%), *Escherichia coli* (11%) and *Proteus mirabilis* (10%) the most frequent isolates. Only 7 of 42 (17%) noninfected wounds had positive cultures, with only *S aureus*, *S epidermidis* and *Corynebacterium* species isolated. Ninety-five percent of the noninfected wounds had blood or serous collections present. Rupture of membranes lasting longer than six hours, emergency cesarean delivery and morbid obesity were associated with a statistically increased likelihood of the development of infected wounds. Emergency cesarean delivery and morbid obesity, but not prolonged rupture of membranes, were associated with an increased likelihood of the development of noninfected wounds. The shortcoming of the study is small sample size.

CONCLUSION

Authors found that risk factors were anaemia, hematoma, blood transfusion and obesity.

REFERENCES

1. Santalla A, López-Criado MS, Ruiz MD, Fernández-Parra J, Galloa JL, Montoya F. Surgical site infection. Prevention and treatment. *Clin Invest GinecolObstet* 2007; 34:189-96.
2. ACOG Practice Bulletin No. 120: Use of prophylactic antibiotics in labor and delivery. *Obstetrics and gynecology*. 2011;117(6):1472- 83.

3. Gordillo GM, Sen CK. Revisiting the essential role of oxygen in wound healing. *Am J Surg*. 2003;186:259–26.
4. Olsen MA, Butler AM, Willers DM, Devkota P, Gross GA, Fraser VJ. Risk factors for surgical site infection after low transverse cesarean section. *Infect Control Hosp Epidemiol*. 2008; 29:477–84.
5. Mitt P, Lang K, Peri A et al. Surgical-site infections following cesarean section in an estonian university hospital: postdischarge surveillance and analysis of risk factors. *Infect Control Hosp Epidemiol*. 2002; 26(5):449-54.
6. Al Jama FE. Risk factors for wound infection after lower segment cesarean section. *Qatar Med J*. 2012; 2012(2):26- 31.
7. Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for cesarean section. *Cochrane Database Syst. Rev*, 2002, CD000933.
8. Jido T, Garba I. Surgical-site infection following cesarean section in Kano, Nigeria. *Ann Med Health Sci. Res* 2012; 2(1):33-6.
9. Magann EF, Chauhan SP, Rodts-Palenik S, Bufkin L, Martin Jr JN, Morrison JC. Subcutaneous stitch closure versus subcutaneous drain to prevent wound disruption after cesarean delivery: A randomized clinical trial. *American journal of obstetrics and gynecology*. 2002 Jun 1;186(6):1119-23.
10. Hellums EK, Lin MG, Ramsey PS. Prophylactic subcutaneous drainage for prevention of wound complications after cesarean delivery—A meta-analysis. *American journal of obstetrics and gynecology*. 2007 Sep 1;197(3):229-35.
11. Killian CA, Graffunder EM, Vinciguerra TJ, Venezia RA. Risk factors for surgical-site infections following cesarean section. *Infect Control Hosp Epidemiol*. 2001; 22(10):613- 617.
12. Martens MG, Kolrud BL, Faro S, Maccato M, Hammill H. Development of wound infection or separation after cesarean delivery. Prospective evaluation of 2,431 cases. *J Reprod Med*. 1995;40:171–175.