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Study of Wound Infection: Major Morbidity After Caesarean Section

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ABSTRACT

This is a retrospective analytical study conducted of patients undergoing caesarean section at tertiary centre in Ahmedabad,India, between JUNE 2012 to JULY 2013 with the aim to assess incidence of caesarean wound infections, its severity and associated risk factors. The study shows that 30.36% are c-section among total deliveries conducted at the institute. Post-operative complications were 2% UTI, 10% unexplained fever, 1.2% puerperal sepsis, 6.51% wound infection, 3% paralytic ileus.Most common complication is post-operative unexplained fever; complication which increases morbidity is wound infection. It increases hospital stay, hospital expenditures and interferes with mother-infant interaction. Major factors related to wound infection are poor nutrition (iron deficiency anaemia and protein calorie malnutrition), poor hygiene, pregnancy induced hypertension, indication of surgery and labor duration. No significant difference is found in emergency and elective surgeries. Wound infection was higher in unregistered patients. Most common isolate from the wound infections was staphylococcus aureus.

KEYWORDS : Wound Gaping, Cesarean Section, Post operative

INTRODUCTION

The incidence of c- section has increased word wide (about 27-30%),in india it is about 32-60% .Increase c-section rate has contributed to increase incidence of wound morbidity. Wound infection from ceaserian delivary are associated with significant emotional and economical burdern.Post partum period is a challenging time for women,as a result of stressors such as fluctuation in hormone levels,caring for a new born baby and recovering from the actual process of delivery process.A postoperative wound complication further intensifies an already difficult period of adjustment. Approximately 15% of women undergoing caesarean delivery develop wound infections[1]. Wound infections delay the recovery, prolong the hospitalization, necessitate readmission or prolong outpatient treatment. Total costs including indirect expenses related to this morbidity increases the burden on the hospital economics and also increases the family burden.It is therefore important to identify and treat the risk factors / predisposing factors / comorbid factors which contribute to wound infections and bringing back women to optimal condition and hence decreasing the incidence of wound complications.

Objectives of the Study:

- To assess the incidence of caesarean wound infections and its severity.
- To study the risk factors / comorbid factors.
- To find out preventive methods to decrease morbidity after ceaserean delivary.

MATERIALS AND METHODS

Source of Data :

Study involves all patients who undergo caeserean delivariy at tertiary care centre, Ahemadabad, Gujarat, India between JUNE 2012 to JULY 2013.

Method of Collection of Data :

- Combined retrospective and prospective study.
- Retrospective study of patient readmitted for wound infection.
- Prospective study of that patient for further outcome.

Inclusion Criteria :

All women who undergo caesarean delivery.

Exclusion Criteria :Other systemic complications of respiratory system, cardiovascular system, gastrointestinal tract and central nervous system.

RESULTS

From June 2012 to July 2013 the total number of deliveries was 5,055. There were 1,535 cases of caesarean delivery. The incidence of caesarean delivery was 30.36% of all deliveries during thestudy period. Among the 1,535 studied patients, the mean maternal age was 28 . 1158 (almost 80.69%)of the babies were born at more than 37 weeks of gestational age.There were 1,163 (81% of all cases) emergency operations for indications occurringduring delivery and / or planned caesarean delivery performed before the scheduledtime because of the onset of labour. 372 (19% of all cases) elective caesareansections were performed, i.e., the operation had been planned by an obstetrician at theantenatal clinic and was performed at the scheduled time.

Table No:1

Indications	Percentage
Previous caesarean delivery	17.25
Failed induction of labour	11.83
Breech presentation	9.9
Feotal distress	5.73
Twin pregnancy	4.97
No progress in labour	3.79

Table No:2

Variable	Patients with wound Infection (100)	Patients without Wound infection (1435)	P value <0.05 signif-icant
Total patients undergone c-section(1535)	100	1435	-
Age<20year	1	243	>0.05
20-30year	82	606	
>30year	17	586	
Gestation <37wk	5	277	>0.05
>37wk	95	1158	
Operative time <40min	12	865	>0.05
>40min	82	570	

Variable	Patients with wound Infection (100)	Patients without Wound infection (1435)	P value <0.05 signif-icant
Admission >5days	55	543	>0.05
<5days	45	892	
ANC yes	77	1093	>0.05
No	23	342	
Membrane ruptured	65	502	<0.05
Not ruptured	35	933	
Socio economic status middle	4	54	>0.05
Lower	96	1381	
Type of sugery elective	16	356	>0.05
Emergency	84	1079	

Above table shows that main factors related to wound infection are rupture of membrane,long operation duration,long stay in hospital. Among this rupture of membrane significantly related to wound infection.($p<0.05$)

Table No: 3

Total patient with wound infection	100
Treated conservatively	70
Wound gapping up to sheath	26
Wound gapping up to rectus muscles	3
Brust abdoman	1

Overall the incidence of abdominal wound infection after caesarean delivery was 6.51%, compared with an overall rate ofless than 5% in 2004 from 130 hospitals in the United States that report to the National Nosocomial Infections Surveillance (NNIS) System (NNIS, 2004). All abdominal wound infections occurred between 3 to 25 days postoperatively (mean 9.64 days). Of the 100 infected cases, 26 with wound gapping up to sheath,3 with wound gapping up to muscles,1 with brust abdoman with pelvic abcess.

Table No 4

Organism	No of patients
Staphylococcus aureus	12
E coli	5
Pseudomonas aeruginosa	2
Klebsiella pneumoniae	1
Coagulase-negative Staphylococci	1
Others	79

Table No 5

variable	wound gapping(30)	wound infection without wound gapping(70)	p
HB<7 >7	21 9	20 50	<0.05
PIH with without	19 11	27 53	>0.05
Diabetes yes no	5 25	1 69	>0.05

Above table shows 30% of wound infection are related with wound gapping. Anemia is significantly associated with wound gapping(<0.05%). This reflects poor nutrition is major preventable factor which can increase post partum morbidity. Pragnancy induced hypertention and diabetes also related to wound infection and wound gapping.

Discussion

The main goals of the surveillance were to determine theincidence of abdominal infection rate and to examine the risk factors associated withabdominal wound infection after caesarean delivery.Multiple risk factors contribute to surgical site infection following caesarean delivery.In this study, the one risk factor identified that possibly could be changed in an effortto prevent abdominal wound infection is the use of antibiotic prophylaxis in patientswith ruptured membranes. Our study demonstrated that patients with ruptured membranes did have asignificantly higher rate of infection compared to patients without rupturedmembranes ($p<0.01$).Our findings concur with the recommendation of the American College ofObstetricians and Gynecologists (1997, 2004) and the Medical Letter (Abramowicz,1999) antibiotic prophylaxis only for caesarean patients with active labour or rupturedmembranes.Numerous studies have recommended that antibiotic prophylaxis be given to allcaesarean delivery cases for prevention of serious infections (Ehrenkranz et al, 1990;Hopkins & Smaill, 2006)[2].

In our current set up all patients undergoing caesarean section should be given prophylactic injectable antibiotics. But after this study result current policy should be changed to higher antibiotics should be given to the patients having prolong rupture of membrane.The second most common and preventable factor is anemia. Which can be prevented by improving antenatal care, incresing awareness regarding taking hematinics and diet.In our institute about 99% patients with wound infection detected when patients coming for stich removal on 8th to 10th day of surgery. These patients readmitted for further management.For this reason, information on wound care should be given to patients beforedischarge home. General caesarean delivery wound care advice for women includesencouraging women to take prescribed analgesia, to complete antibiotic courses ifprescribed, to wear loose comfortable clothes and cotton underwear, to bath orshower daily, to gently clean and dry the wound well (flannels or washcloths shouldbe washed and freshly laundered) and only apply dressings if advised by the doctor ormidwife (Bick et al, 2002).Patients should also be instructed on recognizing the warning signs for woundinfections and be encouraged to report any fever immediately (Owen & Andrews,1994)[5]. In addition, follow-up contact within 1 week should be considered in womenwho are discharged before the fourth postoperative day.Earlier studies have demonstrated that the antecedent of previous caesarean deliveryis an important risk factor for subsequent or repeated caesarean delivery, givingrelevance, even today in many other countries, one caesarean delivery will always befollowed by another (Trujillo et al, 2002).We found a similar result in the current study that previous caesarean delivery (17.25)was the most common indication of caesarean delivery followed by failed inductionof labour (11.83%) and breech presentation (9.90%). Since previous caesareandelivery is such an important indication for repeated caesarean delivery, effectsshould be made to avoid first caesarean delivery. The root cause solution to reducethe surgical wound infection post caesarean delivery is to reduce the caesareandelivery rate by increasing the rate of vaginal birth whenever possible (Dodd &Crowther, 2004) if caesarean is not necessary[3].

Further studies should provide more information to help or develop strategies toreduce the rates of abdominal wound infection and improve our standard of obstetricservices by understanding all these risk factors in local women. The results may alsohave an impact on future delivery and further fertility of women with caesareandelivery.

Some variables that had been predictors of post-caesarean wound infection could notbe confirmed in this study, shown by others to be gravity, parity, antenatal care(Pothinam et al, 1992)[4], type of operation (elective / emergency), duration of ruptureof membranes (Martens et al, 1995), ASA score, experience of the surgeon and bloodloss (Tran et al, 2000)[1]. A larger sample may be needed to confirm their independent predictiverole.

Strengths and limitations

In compliance with the CDC recommendations for an appropriate infection controlpresence (Haley et al, 1985), we allocated a full-time infection control nurse to beavailable for continuous monitoring of infection control practices on the obstetricwards. Our hospital is approved for residency training, and a regular number oftrainees spend time in the obstetrical department. Within the one-year study period,from the data collection to the analysis of the results by a trained investigator, thatmay maximize the reliability and minimize observer bias (Peat et al, 2002).One of our limitations was all our patients were recruited from a single publichospital with a small number of infected cases in current surveillance. Results maydiffer in other health care settings such as private hospitals. This difference maycause a selective bias and may reduce the external validity of the study that isgeneralizablility of the results to the community. It is suggested that further study indifferent locations or hospitals, and to obtain co-operation between different healthcare settings for further improvement to prevent selection bias (Peat et al, 2002) interms of prognosis or responsiveness to treatment.

Conclusion

The caesarean delivery rate has been steadily increasing over the last 30 years and itis common for major centers to have a rate in double figures. The development of awound infection after caesarean delivery is a morbid event and may result insignificant patient discomfort, inconvenience and embarrassment, prolonged hospitalstay, additional surgery and increased cost of community care following discharge.

Surgical wound infections are common and they consume a considerable pattern of the health care finances. Although the infection rate can be reduced by the judicious use ofantibiotic prophylaxis, the use of organized systems of wound surveillance and reporting is an effective means to reduce the wound infections.

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