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Antiseptic Vaginal Preparation before Cesarean Delivery to Reduce Post Operative Infection: A Randomised Controlled Trial

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ABSTRACT

Postoperative infection is one of the important complications of cesarean section. Post cesarean infection is usually polymicrobial and caused by ascending infection from vaginal flora. Vaginal antiseptic preparation with povidone iodine is likely to reduce the bacterial load which may reduce the incidence of post operative infection.

Aim of our study is to determine the role of preoperative vaginal preparation with povidone iodine to reduce post cesarean infectious morbidities.

This is a randomized case control study based on mothers undergoing cesarean delivery from January 2013 to July 2014. Women were categorized in to two groups – who received vaginal antiseptic preparation with povidone iodine before cesarean section and those who did not receive. Age, gestational age, BMI, Hb%, birth weight, cervical dilatation, membrane status was compared between the two groups. Outcome was measured in term of endometritis, abdominal wound infection and readmission for late infection.

In conclusion vaginal antiseptic preparation is not significantly effective in reducing post cesarean infectious morbidities in present day obstetrics.

Key words: *Antiseptic vaginal preparation; cesarean section; post operative infection.*

INTRODUCTION

Cesarean section is the most common operation in present day obstetrics. Post operative infection is one of the important complications of cesarean section. Women undergoing cesarean section have a 5-20 times more risk of infection comparing to vaginal delivery [1]. During cesarean section uterine cavity is opened and communicates with the vagina as well as the abdominal cavity. Presenting part of fetus and surgeons hand may come in direct contact with vaginal bacterial flora, especially when the operation is done in labour which may be inoculated in uterus and abdominal cavity resulting in endometritis, pelvic infection, peritonitis and sepsis. Post cesarean infection is usually polymicrobial. Vaginal flora include Doderlin's bacillus (60-70%) yeast like funguses, Staphylococcus albus or aureus , anaerobic Streptococcus, Streptococcus beta hemolyticus, E coli and Bacteroids. Source of post cesarean infection is either ascending infection from genital tract or may be hematogenus from any infected site (throat/ skin) or it may be contacted from outside the patient(from hospital or attendents). Organisms responsible are Streptococcus hemolyticus group –A, Streptococcus hemolyticus group –B,Staphylococcus aureus, E-coli, Klebsiela, Pseudomonas, Proteus, Chlamydia. Anaerobic organisms are Streptococcus, Pepto-coccus, Bacteroids (fragilis, bivius, fusobacteria, mobiluncus) and Clostridia[2,3,4].

Risk factors of post cesarean infection includes prolonged rupture of membrane, prolonged labor with multiple vaginal examinations, intrapartum fever low socioeconomic status, systemic illness, poor hygiene, obesity, anemia and the presence of co morbid immune compromised state such as diabetes mellitus or Human immunodeficiency virus infection[2,5]. Antiseptic vaginal preparation has been shown to decrease the quantitative load of vaginal microorganisms[6,7].

Other studies have shown varying results of post operative infection using pre operative vaginal antiseptic preparation with povidone iodine before cesarean section[7,8,9,10]. A study using chlorhexidine showed reduction of endometritis [11] whereas a study using vaginal metronidazole reported a reduction in endometritis but was limited by a small sample size[12]. Vaginal bacterial flora have been cultured from the delivering surgeon's glove in 70% cesareans that follow labor [13].

Objective of our study was to determine whether antiseptic vaginal scrub with povidone iodine reduces the risk of post cesarean infective complications.

MATERIALS AND METHODS

This study was conducted at North Bengal Medical College from January 2013 to July 2014. Ethical clearance was taken from institutional ethical committee. There are more than 11000 deliveries per year with a cesarean section rate of about 24% in this institution. Our study was a randomized case control study. The surgeon and patient were not blinded to the allocation. The study was open to all pregnant women undergoing cesarean section in our department and who are over 18 years of age and able to give informed consent . Exclusion criteria from enrollment were

cesarean section with deeply engaged head, bleeding placenta previa, active genital herpes and allergy to iodine. Randomization was done by computer generated random numbers.

After taking informed consent subjects were randomly assigned to any of the two groups – intervention group or control group. In intervention group vaginal scrub was given with 5% povidone iodine from apex of vagina to vulva including all fornices and all vaginal walls before abdominal scrubing for cesarean section. Control group did not receive vaginal scrubbing. All patients received abdominal scrubbing with povidone iodine and prophylactic antibiotic ceftriaxone 1 g iv after clamping of umbilical cord. Cesarean section technique and skin closure was left surgeons' preference and was not included in our study.

Complications which were analyzed in our study were endrometritis, abdominal wound infection and readmission due to late infection. Endometritis was defined as uterine tenderness plus postoperative fever with leucocytosis, wound infection was diagnosed as formation of stitch abscess with or without stitch separation.

We enrolled all cesarean sections in the time period who gave consent based on our inclusion and exclusion criteria. Total 294 mothers were enrolled in our study. 147 mothers were allocated to intervention group and 147 mothers were allocated to control group. Follow up and documentation of data was not possible in 9 mothers in intervention group and 11mothers in control group. So analysis was done for 138 mothers in control group and 136 mothers in intervention group. Statiscal analysis was done using statistical software MadCalc, version 11.6. and by StatPac software

RESULT AND ANALYSIS

A total of 274 mothers were included in our study. General health condition, demographic characteristics and management before cesarean section were analyzed between the two groups.

Table 1: Descriptive statistics for women in study population:

variable	Control group (n=138) ±SD	Intervention group(n=136) ±SD	P value
Age(y)	23.90±3.24	24.10±3.16	0.6055
Gestational age in days	278.79±6.32	27278.22±6.83	0.4739
BMI	24.18±1.59	23.96±1.47	0.2356
Cervical dilation during cesarean section	3.92±1.83	4.26±1.78	0.1202
No of vaginal exam. Before CS	2.81±1.12	2.67±1.23	0.3253
Preoperative hemoglobin	10.52±0.32	10.57±0.37	0.2324
Birth weight	2.87±0.43	2.81±0.37	0.2171

p-value was calculated by using independent groups t-test by StatPac software

Table shows that there was no significant difference between the two groups. Other characteristics of study population were analysed and we found no significant difference. In our study 63(43.4%) mothers were primigravida in control group and 69(51.11%) primigravida in intervention group. In control group 12(8.7%) mothers and in intervention group 11(8.0%) mothers were suffering from gestational diabetes mellitus . 94(68.1%) mothers in control group and 92(67.6%) mothers in intervention group were in labor during cesarean section. During admission 18(12.4%) in control group and 16(11.8%) in intervention group were with ruptured membrane.

Table 2: Post operative complications in both groups.

Complications	Control group(n=138)	Intervention group(n=136)	P value	RR(95% CI)
Endometritis	5(3.6%)	3(2.2%)	0.4908	0.6088(0.1484-2.4978)
Wound infection	7(5.0%)	4(2.9%)	0.3735	0.5798(0.1737-1.9356)
Readmission	4(2.8%)	2(1.4%)	0.4288	0.5074(0.0945-2.7244)

Infectious morbidity was compared in the table 2. There was a trend of lesser complication in the group who received vaginal scrub before cesarean section but the difference was not statistically significant.

DISCUSSION

In our study vaginal antiseptic preparation with povidone iodine before cesarean delivery was associated with a decreased incidence of postoperative infectious morbidities but the reduction was not statistically significant. The intervention of vaginal anteseptic preparation is a safe and quickly performed procedure. Use of prophylactic antibiotic has helped reduce postoperative infection. Preparation of vagina with povidone iodine has been shown to decrease the vaginal bacterial load. This effect is rapid, occurring within 5 minutes making it useful before cesarean section[14]. Findings of our study is similar to the study of Reid VC , Hartmann KE et al [15] who did not find statistically significant difference. Guzman MA; Prien SD et al [8] reported reduced rate of post cesarean related infections by vaginal preparation with povidone iodine before cesarean section. Another study of intravaginal metronidazole given just before cesarean section demonstrated significant reduction in incidence of post operative infection but rate of endometritis in placebo group was very high[15]. Outcome of our study is similar to the studies conducted by david et al and ried et al[9,14] who also showed no statistically significant difference of infectious morbidity between the two groups. The strength of our study was dropout rate was very small. Limitation of our

study was that all mothers received prophylactic antibiotic which tremendously reduced the rate of post operative infection in both the groups.

CONCLUSION

Vaginal antiseptic preparation with povidone iodine before cesarean section may decrease the post operative infectious morbidity but in our study the difference was not statistically significant.

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