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Research Article

Postoperative Vaginal Cleaning with Povidone Solution and Reduction in the Rate of Endometritis and Wound Infection

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Abstract

Background: Caesarean Section is an operation performed worldwide at increasing rates. Postoperative complications, including endometritis and wound infections, contribute to increased maternal mortality. Antibiotic prophylaxis is used to lower the risk of infection, but with rising bacterial resistance, it is not enough. Several other strategies have been proposed; this study aims to see whether postoperative vaginal cleaning with povidone solution reduces complications.

Methodology: This was a comparative study with two groups, Group 1, where vaginal cleaning was done after caesarean section and Group 2, where no vaginal cleaning was done. Rates of endometritis, wound infection, fever, and duration of hospital stay were compared. Chi-Square Test and descriptive statistics were used to compare the results.

Results: There were 100 women, with both groups having 50 patients. Group 2 had a statistically higher risk of complications ($p < 0$), with wound infection being the highest in 34% of the patients. Endometritis was found to be 12% in Group 2, and patients also had a longer ward stay ($p < 0$). 80% of Group 1 had no complications, and rates of wound infection and endometritis were equal (6%). In both groups, the proportion of women who experienced postoperative fever remained the same.

Conclusion: Postoperative vaginal cleaning with povidone can be used effectively to reduce the rates of endometritis and wound infection. It should be considered in combination with other approaches to enhance outcomes, particularly in patients with risk factors.

Keywords: Caesarean Section (CS); Wound Infection

Introduction

Caesarean Section (CS) is an important part of obstetric practice that can improve outcomes for the mother and the baby. However, it is a major surgery associated with more risk than vaginal delivery, wound complications, infections, and longer hospital stay [1]. Severe maternal morbidity increases with repeated Caesarean sections [2], with surgical complications [3], and a higher rate of adverse events, including excessive blood loss, difficult delivery, and dense adhesions [4]. Emergency CS especially has a higher rate of postoperative complications than planned CS [5]. After a caesarean, the risk of infection is known to increase by nearly five-fold [6].

Postpartum endometritis is common after a CS, being reported in around 50% of the patients [7]. Wound infection, which involves both surgical site and suture infection, has a incidence of 9.6% [8].

It is known that the rate of infection is higher in women who are young, with poor prenatal care, poor nutrition, who are underweight or overweight, women who experienced ruptured membranes or prolonged labour, and had a long duration of operation [9]. A lot of these factors cannot be controlled after the onset of labour, but steps can be taken to reduce the risk of infection.

Vaginal cleaning is known to be an inexpensive way to reduce the rates of postoperative complications after CS. It has been found that preoperative vaginal cleaning significantly decreases the risk of endometritis and wound infection [10-12]. Cleaning can be performed using antiseptics, povidone or chlorhexidine, reducing the endometritis rate from 8.7% to 3.8% [13].

Preoperative cleaning is difficult to plan in emergency cases, and most previous studies have excluded emergency cases [11,14]. We performed postoperative vaginal cleaning since we included emergency CS in our study. In developing countries with high emergency CS rates, it is essential to consider resources and time when deciding on risk-reducing interventions.

This study aimed to assess whether postoperative vaginal cleaning with povidone solution reduces the risk of complications after caesarean section.

Methods

This was a comparative study conducted at Hamdard University Hospital. Study participants were divided into two groups, Group 1 included patients who underwent vaginal cleaning with povidone, and Group 2 included patients who did not undergo vaginal cleaning. The inclusion criteria were women who underwent a caesarean section at the hospital and consented to participate in the study. The exclusion criteria were women who did not consent, those who were allergic to povidone, or those with genital herpes.

Cleaning was performed using 10% povidone solution postoperatively. The control group did not undergo vaginal cleaning. Comparative analysis was conducted using the length of ward stay and postoperative complications, including fever, wound infection, and endometritis. All patients were followed up after two weeks and then six weeks. Other relevant obstetric data, such as parity, gestational age, the reason for admission, and CS indication, were also collected. Endometritis was defined as fever with uterine tenderness and foul-smelling vaginal discharge. Fever was defined as elevated temperature above 38 Celsius.

Results

A total of 100 women were recruited for this study. Both groups had 50 patients. Descriptive statistics and Chi-square test were used to analyze the data. The data was analyzed using the software IBM SPSS Statistics 26.

Characteristics of the patients are given in Table 1. There are no statistically significant differences between the two groups for age, gestational age, and parity. Group 1 had reduced rates of complications ($p < 0.00$) and shorter postoperative ward stay than Group 2 ($p < 0.00$). The most common complication was fever in Group 1(8%) and wound infection in Group 2 (34%) (Table 2). The number of patients who developed fever was the same in both groups. The rate of endometritis was 6% in Group 1 and twice that (12%) in Group 2. The most common indication for CS among all participants was a previous caesarean section, and thirty-five women had emergency CS (Table 3).

Discussion

This study shows that postoperative vaginal cleaning effectively reduces endometritis, wound infections and length of hospital stay compared with no cleaning. The results are in accordance with other studies, which state that vaginal washing reduces the risk of endometritis and wound infections and shortens hospital stay, with povidone-iodine showing the most significant reductions [12].

Antibiotic prophylaxis for CS reduces the number of infections by 60 to70% [15], but infectious morbidity remains a concern. The flora from the vagina or cervix moves up the genital tract to the uterus during delivery, which can lead to complications. Group B streptococcus or Enterococcus faecalis from the upper genital tract is associated with endometritis after CS [16]. Antibiotic resistant strains, specifically, Methicillin-resistant S aureus (MRSA), are becoming common in skin and soft-tissue infections. A study found that 3.5% of pregnant women were positive for MRSA [17]. Further, MRSA is the most common organism in post-caesarean wound infections [18]. In another study, most women who underwent CS were affected by gram-negative bacteria resistant to medication [19]. The number of patients with fever was the same in both groups. This finding is similar to other studies, which showed no significant differences in the rate of fever despite vaginal cleaning [13,20,21]. Fever is common for one or two days after most surgeries [22], but persisting fever is usually the sign of infection or sepsis and should be further evaluated.

		Group 1 (N = 50)		Group 2 (N = 50)		
Characteristics		**Frequency**	**Percentage**	**Frequency**	**Percentage**	**p value**
Age	< 30 years	38	76.00%	36	72.00%	0.648
	> 30 years	12	24.00%	14	28.00%	
Gestational Age	< 37 weeks	27	54.00%	22	44.00%	0.317
	> 37 weeks	23	46.00%	28	56.00%	
Parity	Nulliparous	12	24.00%	18	36.00%	0.19
	Multiparous	38	76.00%	32	64.00%	
Were there any postoperative complications?	Yes	10	20.00%	27	54.00%	P < 0
	No	40	80.00%	23	46.00%	
Post-Op Ward Stay	< 2 days	45	90.00%	26	52.00%	P < 0
	> 2 days	5	10.00%	24	48.00%	

Table 1: Vaginal Cleaning with Povidone Solution After Caesarean Section.

Complications	**Group 1 (N=50)**		**Group 2 (N=50)**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
None	40	80.0%	23	46.0%
Fever	4	8.0%	4	8.0%
Wound Infection	3	6.0%	17	34.0%
Endometritis	3	6.0%	6	12.0%

Table 2: Outcome for the study groups.

		Frequency (N = 100)
Reason of Admission	Labour Pains	7
	Elective	58
	Emergency	35
Indication of Caesarean Section	Failed Induction	7
	Fetal Distress	8
	IUGR	7
	Other	5
	Previous CS	54
	Prolonged Labour	15
	Scar Tenderness	4

Table 3: Reason for Caesarean Section in all women.

The most common reason for a CS among our study participants was a previous caesarean, followed by prolonged labour. Other studies reported similar results; prolonged labour is the most common indication for urgent CS [23]. Multiple caesareans can increase the length of ward stay, need for intensive care unit admission, blood transfusion, and ventilation [2], and prolonged duration of labour can increase postpartum complications [24]. It is crucial to consider efforts for risk reduction in patients with factors predisposing them to poor outcomes.

Postoperative cleaning with povidone-iodine has been shown to reduce severe complications such as bacteremia and sepsis after

prostate biopsy [25]. Povidone has broad spectrum activity against gram-positive and gram-negative bacteria, including resistant strains, fungi, and protozoa [26]. For caesarean delivery, the protocol to reduce infections currently includes preoperative vaginal preparation with povidone, preparation of the surgical site, and antibiotic prophylaxis [27]. We recommend adding postoperative vaginal cleaning to decrease the risks further.

Conclusion

Postoperative vaginal cleaning can significantly decrease wound infection, endometritis and length of hospital stay and should be considered a cost-effective way to lessen postpartum complications.

Limitation

The limitation of this study was the small sample size. We did not include factors such as duration of surgery or body mass index, which can affect outcomes. A large-scale, multicenter study should be done to evaluate the effect of vaginal cleaning with povidone after a caesarean section.

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