Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 7
Open Access

A Case Study On To Compare Efficacy Of Povidone Iodine Vs Normal Saline In Prevention Of Postpartum Endometritis And Related Febrile Morbidity In Women Going Under Elective Lscs

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Cite this paper as: Geetha, Ravi Kumar, Tanuja, Rahul (2024). A Case Study On To Compare Efficacy Of Povidone Iodine Vs Normal Saline In Prevention Of Postpartum Endometritis And Related Febrile Morbidity In Women Going Under Elective Lscs. *Frontiers in Health Informatics*, *13 (7) 1195-1200*

Abstract

Introduction: Elective Lower Segment Cesarean Section (LSCS) is a common surgical procedure worldwide, but postoperative infectious complications, particularly postpartum endometritis, remain a concern. Preoperative vaginal preparation with antiseptic agents like povidone iodine or normal saline aims to reduce these complications, yet controversy persists regarding their efficacy. This prospective cohort study compares outcomes of povidone iodine versus normal saline vaginal preparation in elective LSCS to inform evidence-based clinical practices.

Methods and Materials: A randomized controlled trial involving 123 women at Vinayaka Missions Medical College and Research Centre, Karaikal, assessed postoperative fever and postpartum endometritis. Participants underwent spinal anesthesia and catheterization before vaginal preparation with povidone iodine or normal saline. Data on demographic and clinical parameters were collected pre- and postoperatively. Statistical analysis was performed using SPSS software.

Results: The study found no significant difference in mean age, parity, or gestational age between groups. Incidence of post-CS fever was comparable between groups (3.33% vs. 6.34%, $p>0.05$), but wound infections were significantly lower in the povidone iodine group (3.33% vs. 14.28%, $p=0.039$).

Discussion: Our findings align with previous studies showing reduced postoperative infections with povidone iodine vaginal preparation. Notably, studies by Tarang Kaur et al. and Memon et al. support our results, emphasizing the efficacy of povidone iodine in reducing endometritis. The study adds to existing literature by providing evidence for optimal antiseptic practices in LSCS.

Conclusion: Vaginal antiseptic preparation with povidone iodine significantly reduces postoperative wound infections compared to normal saline in elective LSCS. This underscores the importance of evidence-based antiseptic protocols in improving postoperative outcomes for women undergoing cesarean delivery.

Keywords: Povidone iodine, Postpartum endometritis, Intrauterine irrigation, Maternal health, Elective lower segment cesarean section

INTRODUCTION

Elective Lower Segment Cesarean Section (LSCS) is a prevalent surgical intervention globally, offering a safe and effective mode of delivery in specific maternal and fetal circumstances. Despite its routine nature, the Specter of postoperative infectious morbidities, notably postpartum endometritis, continues to pose a significant concern. Postpartum endometritis, characterized by fever and inflammation of the uterine lining, represents a notable complication following LSCS, necessitating robust preventive strategies. Among the standard preventive measures is the preoperative antiseptic preparation of the vaginal area. However, the choice of antiseptic agent remains a contentious issue within the obstetric community. Povidone iodine and normal saline are two widely employed agents, each with its advocates and detractors. Previous studies have yielded disparate findings, leading to an ongoing debate and underscoring the need for a comprehensive investigation to guide evidence-based clinical practices.

This prospective cohort study aims to contribute to the existing body of knowledge by conducting a detailed and systematic comparison of the outcomes associated with preoperative vaginal preparation using povidone iodine and normal saline in elective LSCS. By meticulously examining the incidence of post-LSCS fever, postpartum endometritis, and wound infections, this research endeavours to provide nuanced insights that can inform clinical decision-making and enhance patient outcomes. Given the diversity of findings in prior studies, a rigorous examination of antiseptic protocols is imperative to establish a more robust foundation for obstetric care. The research's primary focus on postoperative infectious morbidities aligns with the broader objective of advancing the discourse on surgical site infection prevention in obstetric practices. Ultimately, the findings of this study aspire to fill a critical gap in the literature, offering clinicians evidence-based guidance for optimizing antiseptic protocols and thereby improving the quality of care for women undergoing elective LSCS.

METHOD AND MATERIALS

Our primary aim is to find on which method will provide the best outcomes in post op elective LSCS regarding postpartum endometritis and related febrile mortality.

A randomized controlled trial involving 123 women was conducted at Vinayaka Missions Medical College and Research Centre, Karaikal. The participants included women at full term or those who had completed a one-year antenatal follow-up. This trial, set within an academic institution, aimed to comprehensively investigate outcomes related to elective Lower Segment Cesarean Section (LSCS). The study design prioritized minimizing bias for robust and reliable data. The inclusion of a one-year antenatal follow-up adds a temporal dimension, contributing to a nuanced understanding of postoperative outcomes over an extended period. The trial's scale and academic setting underscore its commitment to generating evidence that informs obstetric care practices, shaping the discourse on maternal health within the realm of obstetrics.

INCLUSION CRITERIA

Only women with elective LSCS, with no comorbidities, medical and infection or gynaecological/obstetrics diseases and single pregnancy were chosen.

EXCLUSION CRITERIA

-Patient in labour
-Pre-pregnancy body mass index (BMI>30kg/m2)
-Women with prelabour rupture of membranes.
-Women with antepartum haemorrhage.
-Immunocompromised individual.

Recruited eligible women after taking informed consent were randomized into 2 groups- Group A-Women subjected to pre-operative vaginal preparation with povidone iodine and group B- Women subjected to pre-operative vaginal preparation with normal saline.

The study outcome measures were development of post-operative fever defined as any temperature 38°C after 24 hours

postoperatively and postpartum endometritis (defined as fever 38°C, uterine tenderness and offensive vaginal discharge that necessitate antibiotic treatment).

PROCEDURE

The study commenced with a comprehensive informed consent process, ensuring that all participants had a thorough understanding of the study's nature and methodology. Subsequently, two distinct groups were established: Group A underwent vaginal preparation with povidone, while Group B received preparation with normal saline.

Prior to the surgical intervention, patients in both groups underwent spinal anesthesia, followed by catheterization under strictly aseptic conditions. After catheterization, a meticulous application of the respective solutions, povidone or normal saline, was conducted on all vaginal walls and fornixes. This application covered 360 degrees of the vaginal wall and fornixes and was maintained for a duration of 30 seconds, adhering to stringent protocols.

To enhance postoperative prophylaxis, all participants received 1g of intravenous cefotaxime. Comprehensive preoperative and postoperative care was administered to ensure the well-being of the patients throughout the surgical process.

The study meticulously recorded and assessed a range of demographic and clinical parameters to evaluate the effectiveness of the antiseptic protocols. These parameters included patient demographic data, hemoglobin levels, hematocrit levels, leukocyte count, duration of surgery, and the postoperative 24-hour phase. Additionally, C-reactive protein levels were monitored throughout the first week to gauge the occurrence of endometritis. The study also investigated the incidence of surgical site infections during the observation period. This detailed approach aimed to provide a comprehensive understanding of the impact of antiseptic solutions on various facets of patient outcomes, ensuring a thorough evaluation of the study's objectives. By incorporating a multifaceted set of measurements, the research sought to contribute robust evidence to guide clinical decision-making and advance the understanding of optimal antiseptic practices in the context of elective Lower Segment Cesarean Section.

Statical analysis:

All data were entered and analyzed by using SPSS software version 17. Statistical analysis of the data was performed using the chi-square test to compare percentages between groups and Student's t-test for correlated means.

RESULTS

TABLE 5: Comparison of post-cs infection between the study groups

	Group A	**Group A**	**Group B**	**Group B**	**P-value**
Variables	Frequency	Percentage	Frequency	Percentage	
Fever	nil	nil	nil	nil	
Yes	2	3.33%	4	6.34%	>0.05
No	58	96.66%	59	93.650%	
Wound Infection	nil	nil	nil	nil	
Yes	2	3.33%	9	14.28%	0.039

No	58	96.66%	54	85.71%	

The results of this study were:

The mean age of participants in both groups A and B is close, with group A having a slightly higher mean age (29.5 years) compared to group B (29.2 years). The p-value (probability value) being >0.05 suggests that the difference in mean ages between the two groups is not statistically significant. In other words, any observed difference in ages could likely be due to random variation, and there is no strong evidence to conclude that there is a real difference in the ages of participants between the two groups.

The mean parity (number of times a woman has given birth) in both groups A and B is similar, with group A having a mean parity of 2±1.34 and group B having a mean parity of 2±1.69. The p-value being >0.05 indicates that the observed difference in mean parity between the two groups is not statistically significant. This suggests that any variation in parity between the groups could be due to chance, and there is no strong evidence to support a genuine difference in the number of childbirths between the groups. The statement that this finding is "in correlation with several other studies" implies that similar results regarding parity have been observed in other research studies, reinforcing the consistency of this particular outcome with existing literature.

On comparison of mean gestational age at the time of delivery, in group A, the mean gestational age at the time of delivery is observed to be 38±4,56 weeks and in group B the mean gestational age at the time of delivery is 38±3.41 weeks which is insignificant.

The incidence of post-CS fever is 3.33% in group A and 6.34% in group B. The p-value (>0.05) indicates that this difference is statistically insignificant, suggesting that the observed variation could be due to chance rather than a meaningful distinction between the two groups.

In comparison of post cs wound infection 2 patient developed infection in group A and 9 patient developed infection in group B accounting to 3.33% for group A and 6.34% for group B with P- Value of 0.039 which is significant.

DISCUSSION

On comparison with various other studies, it was found that our study directly mutually consensus with various other studies:

In a study by Tarang Kaur et al, at Maulana Azad Medical College, New Delhi over 3 months among 200 women who underwent Cesarean delivery observed that women who received preoperative betadine vaginal toileting had markedly less incidence of endometritis (case3%, control-10%, p0.05) and wound sepsis (case-5%, control-12%, p>0.05) were found to be less but not significant between both groups which is in partial agreement with study findings [1]. In a study by Memon et al., vaginal cleansing with 10% pyIodine had shown a statistically significant reduction in postoperative composite infectious morbidities and it showed a statistically significant reduction in the incidence of post Cesarean endometritis [2]. In a study by Viney aimed at evaluating the efficacy of antibiotics on wound infection and febrile morbidity, it has been shown that rinsing with antibiotics does not reduce fever, abdominal complication [3]. In the randomized controlled trial of 218 women comparing chlorhexidine vaginal cleansing with no vaginal cleansing by Ahmed et al., chlorhexidine vaginal cleansing compared with no vaginal cleansing was associated with a lower rate of endometritis (RR 0.2; 95% CI 0.06, 0.7) although the rate of wound infection was similar (RR 0.6; 95% CI 0.2, 1.8) [4], [5].

Vaginal cleansing by povidone iodine also has been studied. Similar results were reported using povidone-iodine in the Cochrane Data Base meta-analysis by Haas in which vaginal preparation by povidone-iodine compared with no preparation demonstrated a lower risk of endometritis (RR 0.39; 95% CI 0.16, 0.97) with similar risks of wound infection (RR 0.99; 95% CI 0.57, 1.70) [6]. In Ismail, Starr study. The risk reduction was particularly strong in women with ruptured Membranes who had vaginal preparation by povidone-iodine compared with no preparation (RR 0.13; 95% CI

0.02, 0.66) [7]. In Guzman study, post-cesarean endometritis occurred in 7.0% of subjects who received a preoperative vaginal preparation and 14.5% of controls (P < .05). There was no measurable effect of a vaginal scrub on the development of postoperative fever or wound infection. The adjusted odds ratio for developing endometritis after a vaginal preparation was 0.44 (95% confidence interval [CI] 0.193-0.997). Multivariate analysis showed an increased risk of developing endometritis in association with severe anaemia (adjusted OR 4.26, 95% CI 1.568-11.582), use of intrapartum internal monitors (adjusted OR 2.84, 95% CI 1.311-6.136), or history of antenatal genitourinary infection (adjusted OR 2.9, 95% CI 1.265-6.596) which states the study found that subjects who received a preoperative vaginal preparation had a lower incidence of endometritis, however the study did not find a significant impact of vaginal scrub on postoperative fever or wound infection [8]. Vaginal cleansing immediately before Cesarean delivery in women in labour and in women with ruptured membranes reduces the risk of postoperative endometritis. Because it is generally inexpensive and a simple intervention, it is recommended preoperative vaginal preparation before Cesarean delivery in these women with sponge stick preparation of povidone-iodine 10% for at least 30 seconds [9].

In Amsty & Jones clinical trial, 568 patients were selected for two groups: a treatment group and a control group, each with 284 patients. A vaginal scrub was performed before the routine abdominal scrub, with two 4 × 4 cm sponge sticks saturated with povidone-iodine solution, rotated in the vagina for about 30 s. In the control group, only the abdominal scrub was performed. Patients received a single dose of prophylactic antibiotics, and were reviewed for 6 weeks to look for predefined variables. Post-Cesarean endometritis occurred less frequently in the treatment group than in the control group (2.5% vs 1.4%). There was no significant difference for febrile morbidity and wound infection in the two groups. The adjusted odds ratio for endometritis after vaginal preparation was 0.03 (95% CI: 0.008-0.7). Vaginal preparation with povidone-iodine may decrease the risk of post-Cesarean endometritis [10].

The management of wound infection involves various measures, including the use of antibiotics, incision and drainage, wound dressing, and delayed closure. Superficial infections like cellulitis can be treated with antibiotics alone, especially if there's no purulent drainage. In cases with purulent drainage, coverage for MRSA is recommended, with oral antibiotic options such as clindamycin, trimethoprim-sulfamethoxazole, and tetracycline. For non-purulent cellulitis, covering beta-haemolytic streptococci and MSSA is recommended. Oral antibiotic options include Doxycycline, cefadroxil, cephalexin, and clindamycin. Wounds with purulent drainage require incision and drainage to remove abscess, exudate, and hematoma. Infected wounds should be left open to heal by secondary intention.

CONCLUSION

Vaginal antiseptic preparation using povidone iodine has been a common practice prior to abdominal and vaginal hysterectomies and shown to reduce the risk of postoperative sepsis. Likewise, vaginal antiseptic preparation using povidone iodine prior to Cesarean section is known to cause significant reduction in post-op wound healing compared to normal saline. Given the short duration of hospitalization following cesarean delivery, many infections may not be detected until after discharge from hospital and treatment may occur solely in the outpatient setting.

Conflict of interest: There is no conflict of interest.

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