Original Article

Vaginal Cleansing with Antiseptic Solution Before Caesarean Delivery

Shumaila[1], Samina Saleem[2], Hafsa Tarique[3], Asiya kazi[4], Afshan Abbas[5], Shabnam Ramzan[6]

[1]Postgraduate resident Dept of Obs and Gynae, Patel Hospital Karachi
[2]Laparoscopic Surgeon, Dept of Obs and Gynae, Patel Hospital Karachi
[3]Consultant Gynecologist, Dept of Obs and Gynae Ziauddin Hospital Karachi
[4]Assistant Professor, Pharmacology Department Dow medical College SMBBMC Karachi
[5]Professor, Pharmacology Department Sir Sayed College of Medical Sciences for Girls Karachi

Correspondence: *Dr Shumaila*
FCPS, resident of Obs & Gyane, Patel Hospital Karachi
docsadi12@gmail.com

Abstract

Objective: To evaluate the effectiveness of vaginal cleansing with antiseptic solution before C section to prevent the infectious morbidity.
Methodology: This randomized controlled trial was carried out at Obstetrics and gynecology department of Patel Hospital Karachi from June 2021 to November 2021. Women with term and singleton pregnancy, aged 18 to 40 years, and scheduled to caesarean delivery were included. All the patients were randomly assigned to two groups: the intervention group (vaginal cleansing) before the C-section and the control group (without vaginal cleansing). The effectiveness was assessed based on the wound infections, prolonged hospital stays, and the need for additional antibiotics within 5 to 10 days post C-section. The SPSS version 26 was used to data entry and analysis.
Results: Overall 100 women were enrolled and equally divided in two groups with almost similar mean age of 29.26 years and 28.78 years respectively (p = 0.718). The postoperative infectious was some lower in the interventional group 4% in contrast to control group 12% p = 0.140. Post post-operative fever and endometritis were also less common in the interventional group (2% and 2%) compared to the to control group (4% and 6%) respectively p=0.558. However, the rate of readmission was rare, only in one patient of control group p = 0.315, mean hospital stay was significantly lower in the interventional group 2.84 days, compared to the control group 3.55 days, p = 0.001. Generally, findings indicated that the postoperative infectious outcomes tended to be lower with the vaginal cleansing.
Conclusion: The vaginal cleansing with an antiseptic solution immediately before C-section reduces postoperative infectious morbidity, suggesting that preoperative vaginal cleansing into routine cesarean delivery protocols could be a simple and effective technique to improve maternal outcomes.

Keywords: Antiseptic solution, Vaginal cleaning, C-section, Wound infection.

Cite this article as: Shumaila, Saleem S, Tarique H, Kazi A, Abbas A. Vaginal Cleansing with Antiseptic Solution Before Caesarean Delivery. J Soc Obstet Gynaecol Pak.. 2025; 15(4):305-309. DOI. 0.71104/jsogp.v15i4.990

Introduction

The caesarean section (C- section) is the frequently performed obstetric surgery to protect the lives of mothers and their babies when complications arise during pregnancy or childbirth.[1] The continually increasing rate throughout the world of C-section deliveries has become a major fact of discussion in maternity care, as its occurrence has grown at an alarmingly increases in recent years.[1,2] By mean of the frequency of this procedure continues to grow, the complications associated to it are also on the increase.

While a cesarean delivery can be life-saving when performed for appropriate elective reasons, it still carries significant risks also. In contrast to vaginal birth, the delivery by c-section is linked to higher rates of postpartum maternal complications, including thromboembolic events, serious puerperal infections, wound related problems and others.[3,4]

The surgical site infection after a cesarean section can lead to serious health problems and it may increase the risk of morbidity or even death, prolonged hospital stays, cause secondary infertility, and raise the costs for overall healthcare.[5] The reported rate of surgical site infections (SSI) different across the regions, with studies reporting an average prevalence is 3% to 15%.[6-8] However, such

Authorship Contribution: [1,2,3]Substantial contributions to the conception or design of the work or the acquisition, [5]Final approval of the study to be published, [4,6]Drafting the work or revising it critically for important intellectual content.

Funding Source: none
Conflict of Interest: none
Received: April 25, 2025 Revised: Oct 11, 2025
Accepted: Dec 09, 2025

rate of infection after cesarean delivery can be reduced or avoided after following the healthcare evidence-based practices by staff and work to minimize the preventable causative factors.[6] To additional lower post-cesarean infection rates, the various antiseptic methods have been used for skin and the vaginal cleaning and preparation, though not always constantly. Studies showed that the vaginal cleaning with povidone-iodine or chlorhexidine right before the c-section, rather than using saline or not cleaning at all, possibly contributes to reducing the risk of infection after a cesarean delivery.[9,10]

According to an evidence where reviewed the available research in 2017, and included 11 randomized controlled trials with a total of 3403 women undergoing c-sections and in these studies, eight studies used povidone-iodine for vaginal cleansing, two used chlorhexidine, and one used benzalkonium chloride.[11] Such searched evidence revealed that the using an antiseptic solution to cleanse the vagina just before the cesarean, compared with no cleansing or using only saline or water, reduced the rate of uterine infection by around more than half from 8.7% to 3.8%.[11]

The Povidone-iodine is an iodinated polymer of polyvinylpyrrolidone that provides broad-spectrum antimicrobial action and the surgical field, it is applied to skin and mucous membranes to support the prevention or manage the wound infections by accepting antiseptic qualities of the iodine.[12] Additionally, it is a well-established, wide-range germicide, active not only against bacteria but also against yeasts, molds, protozoa, viruses, and the fungi.[12] However, it remains the most widely used agent for vaginal surgical preparation at the international level and is currently the only antiseptic officially recommended for intravaginal use,[12] while its practice is not widely implemented in united states[13] and at Local level. However, after assessing the antiseptic cleansing of vagina in the local context is essential to determine its effectiveness in decreasing the infection rate after c-section.

Hence this study has been done to evaluate the effectiveness of vaginal cleaning with antiseptic solution before C section to prevent the infectious morbidity, and findings could improve maternal outcomes, in terms of update in local clinical practice, to reduce infection rate and healthcare costs, and to support safe practices of c-section.

Methodology

This randomized controlled trial was carried out at Obstetrics and gynecology department of Patel Hospital Karachi. Study was conducted during six months from June 2021 to November 2021. This study enrolled women aged more than 17 years, with singleton pregnancy, who were scheduled for elective or emergency cesarean section. The with ruptured membranes for >24 hours, women with Active vaginal bleeding and women with known hypersensitivity to povidone-iodine, women diagnosed with chorioamnionitis and any severe infection diagnosed before the surgery were excluded. Study was done after taking ethical approval from Patel Hospital Karachi. Additionally, informed consent was obtained from each case after explaining the purpose and procedure of the study.

All the selected pregnant women who were scheduled for emergency or elective cesarean delivery were randomly assigned to either the intervention group (the women underwent vaginal cleansing with 10% povidone-iodine before surgeries immediately) or the control group (the women underwent standard care without vaginal antiseptic cleansing before surgery). Particularly the patients of intervention group received vaginal cleansing immediately before surgery using sterile gauze soaked in 10% povidone-iodine, gently inserted into the vagina and rotated in a 360 degree sweep for 1 to 2 passes to ensure full contact of mucosa. On the other hand, the patients of control group underwent surgery as per standard protocol of Hospital without intravaginal antiseptic preparation**.** However, all other steps of treatment were the similar, including antibiotic prophylaxis, skin preparation, and operative technique in both groups. After surgeries, the selected patients were monitored daily for signs of infection such as fever, uterine tenderness, foul-smelling, and wound discharge during Hospital stay and follow-up assessments were carried out at 7th postoperative day at OBS and gynae clinic or by the phone call contacts. All the relevant data was documented via study proforma and analysis was done using SPSS version 26.

Results

Overall 100 women were enrolled particularly 50 in interventional group and 50 in control group with almost similar mean age as 29.26 years and 28.78 years respectively (p = 0.718). Mean gestational age was also insignificant statistically in both groups (36.06 years in

the interventional group and 37.0 years in the control group). The pattern of parity showed nearly identical averages (1.80 in intervention group and 1.76 in control group), p = 0.908. Table I

Table I: Descriptive statistics of age, gestational age and parity. (n=100)

Group	N	Mean	SD	p-value
Age				
Interventional group	50	29.26	6.35	0.718
Control group	50	28.78	6.88	
Gestational age				
Interventional group	50	36.06	3.92	0.941
Control group	50	37.00	4.11	
Parity				
Interventional group	50	1.80	1.73	0.908
Control group	50	1.76	1.73	

The prolonged labor occurred slightly more often in the control group among 16% of the women compared to the interventional group in 10% of the women, while findings were statistically insignificant p=0.372. Figure 1

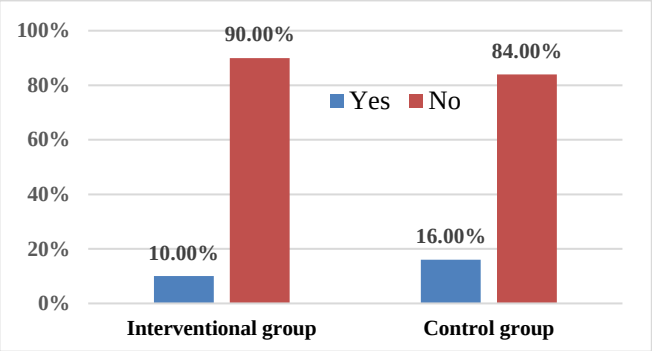

Figure 1. Frequency of prolonged labor among patients. (n=100)

The postoperative infectious outcomes were generally low in both groups, with some lower rate in the interventional group, among 4% of the women in contrast to control group 12% p = 0.140. the post-operative fever was also less common in the interventional group only 2% compared to the to control group 4%, p=0.558. Additionally, the endometritis was noted 2% in patients vaginal cleaning groups and 6% was in standard treatment group p = 0.305. However, the rate of readmission due to infection was very rare, only in one patient of control group p = 0.315. Generally, findings indicated that the postoperative infectious outcomes tended to be lower with the vaginal cleansing. The mean hospital stay was significantly lower in the interventional group 2.84 days, compared to the control group 3.55 days**,** p = 0.001**.** Table II

The overweight and obese women had some higher rate of infection 3.0% and 4.0% in contrast to those with normal BMI only 1%, while the findings were statistically insignificant p- 0.415. Table III

Table II: Wound infection comparison between interventional group and control. (n=100)

Variables		Study groups: Interventional group	Study groups: Control group	p-value
Wound Infection	Yes	2	6	0.140
		4.0%	12.0%	
	No	48	44	
		96.0%	88.0%	
Post-operative	Yes	1	2	0.558
		2.0%	4.0%	
	No	49	48	
		98.0%	96.0%	
Endometritis	Yes	1	3	0.305
		2.0%	6.0%	
	No	49	47	
		98.0%	94.0%	
Readmission	Yes	0	1	0.315
		0.0%	2.0%	
	No	50	49	
		100.0%	98.0%	
Need for additional use of antibiotics	Yes	1	2	0.558
		1.0%	2.0%	
	No	49	48	
		49.0%	48.0%	
Hospital stay	Mean	2.84	0.73	0.001
	SD	3.55	1.31	

Table III: Frequency of wound infection according to BMI. (n=100)

BMI	Wound infection: No	Wound infection: Yes	Total	p-value
Overweight	32	3	35	0.415
	32.0%	3.0%	35.0%	
Obese	57	4	61	
	57.0%	4.0%	61.0%	
Normal	3	1	4	
	3.0%	1.0%	4.0%	
Total	92	8	100	
	92.0%	8.0%	100.0%	

Discussion

The C-sections currently account for more than 20% of births throughout the world, and this proportion is expected to rise to over 30% by the year of 2030,[14,15] with the rising rate of cesarean sections being recognized as a significant risk factor for postpartum infectious morbidity.[14] The numerous preoperative strategies have been implemented to prevent the risk of maternal bacterial infections following c-section, including the antibiotic prophylaxis and the vaginal cleansing preoperatively. This study has been done on 100 women to evaluate pre-operative efficacy of vaginal cleaning with antiseptic solution to prevent the infectious morbidity, by allocating patients equally into an intervention group and a control group with almost

similar mean age as 29.26 years and 28.78 years respectively. The findings were supported by the Ugadu IO et al[12] where mean age of pre-operative vaginal cleansing group was 29.4 ± 5.4 years and Kiani SA et al[16] where mean age was 28.4 ± 4.6 years in vaginal cleansing group and 27.6 ± 5.9 years in control group. Average age of the patients almost consistent across the studies, likely because they selected women within the comparable range of age.

In the context of the present stud the postoperative infectious outcomes were generally low in both groups, with some lower rate in the interventional group (4%) contrast to control group 12%, the post-operative fever was also less common in the interventional group only 2% compared to the to control group 4%. Similarly, the endometritis was noted 2% in patients vaginal cleaning groups and 6% was in standard treatment group with readmission only in one patient of control group.

However, the findings were statistically insignificant. In aligns to this study Abrar S et al[17] reported that the intervention group showed lower rates of fever 6% in contrast to 11% in control group, parallelly the lower rate wound infection, and a significantly reduced incidence of postoperative endometritis, with patients who had PROM significantly less infectious complications generally p=0.001. According to another study by El Sharkawy S et al[18] the post-operative fever occurred significantly lower only in 77.4% of the patients in study group compared to 37% in control group, followed by endometritis, just 1 patient (3.7%) of interventional group and 8(29.6%) in control group, as well as wound infections rate also significantly than control group, (7.4% vs 33.3%) respectively (p <0.05).

Our findings were further supported by Elsayed Negm AA et al[19] where in vaginal cleansing group fever developed in 5.71% patients, endometritis in 4.29% patients and wound infections 2.86%, which were significantly lower than control group as fever in 21.43% patients, endometritis in 18.57% patients and wound infections in 14.29% of the patients p <0.05. Additionally, in this study overweight and obese woman had some higher rate of infection 3.0% and 4.0% compared to those with normal BMI only 1%, while the findings were statistically insignificant p- 0.415.

Consistently Al Budairi ZJ et al[21] reported that the in patients who developed wound infection, the mean BMI was 26.75 ± 6.4 kg/m², indicating that women affected tended to have moderately higher BMI, may contribute to a raised risk of postoperative wound infection. Povidone possess a inclusive antimicrobial efficacy, acting against both gram-positive and gram-negative organisms, including resistant species, along with protozoa and fungi.[22] Generally, studies, including this study, have shown a reduction in infectious morbidity with vaginal cleansing using povidone preoperatively.

Though, this study has some limitations, such as a relatively small sample size and the lack of postoperative vaginal cleansing, which has been justified in some previous reports. Hence future large-scale studies including both pre and post-operative vaginal cleansing are recommended to develop more strong evidence. Moreover, studies should focus on high-risk patient groups, where the likelihood of infection is higher, to better assess the effectiveness of these interventions in reducing postoperative infectious complications, which is not done in this study.

Conclusion

Present study revealed that the vaginal cleansing preoperatively with antiseptic solution can reduce postoperative infections, as the interventional group showed lower infectious morbidity compared to the control group. Additionally, the intervention was linked to significantly shorter hospital stay. However, the elevated BMI and prolonged labor showed trends toward higher rates of infection. Generally, vaginal antiseptic cleansing observed to be a safe and potentially beneficial, supporting its consideration as an infection-prevention measure in deliveries by c-sections.

References

1. Singh N, Pradeep Y, Jauhari S. Indications and determinants of cesarean section: a cross-sectional study. Int J Appl Basic Med Res. 2020;10(4):280–285. https://doi.org/10.4103/ijabmr.IJABMR_3_20
2. Hamilton BE, Martin JA, Ventura SJ, Sutton PD, Menacker F. Births: preliminary data for 2004. Natl Vital Stat Rep. 2005;54:1–7.
3. Singh N, Pradeep Y, Jauhari S. Indications and determinants of cesarean section: a cross-sectional study. Int J Appl Basic Med Res. 2020;10(4):280–285. https://doi.org/10.4103/ijabmr.IJABMR_3_20
4. Keag OE, Norman JE, Stock SJ. Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: systematic review and meta-analysis. PLoS Med. 2018;15:e1002494. https://doi.org/10.1371/journal.pmed.1002494
5. Cabral BG, Brasiliense DM, Furlaneto IP, Rodrigues YC, Lima KV. Surgical site infection following caesarean section by *Acinetobacter* species: a report from a hyperendemic setting in the Brazilian Amazon region. Microorganisms. 2021;9(4):743. https://doi.org/10.3390/microorganisms9040743
6. Odada D, Shah J, Mbithi A, Shah R. Surgical site infections post cesarean section and associated risk factors: a retrospective case-control study at a tertiary hospital in Kenya. Infect Prev Pract.

2024;6(1):100333. https://doi.org/10.1016/j.infpip.2023.100333
7. Rickard J, Beilman G, Forrester J, Sawyer R, Stephen A, Weiser TG, et al. Surgical infections in low- and middle-income countries: a global assessment of the burden and management needs. Surg Infect (Larchmt).2020;21(6):478–494. https://doi.org/10.1089/sur.2019.142
8. Carbonnel M, Brot D, Benedetti C, Kennel T, Murtada R, Revaux A, Ayoubi JM. Risk factors for wound complications after cesarean section. J Gynecol Obstet Hum Reprod. 2021;50(7):101987. https://doi.org/10.1016/j.jogoh.2020.101987
9. Trivedi M, Robinson AM, Islam MR. Effect of vaginal antiseptic prior to caesarean section on the rate of post-caesarean complications: a blinded randomized controlled trial. Trials. 2022;23(1):231. https://doi.org/10.1186/s13063-021-05857-7
10. Chandra S, Singh V. Vaginal preparation with povidone iodine solution before caesarean section and its impact on the post-operative infectious morbidity. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2021 Jul 1;10(7):2775-80. https://doi.org/10.18203/2320-1770.ijrcog20212667
11. Haas DM, Morgan S, Contreras K, Kimball S. Vaginal preparation with antiseptic solution before cesarean section for preventing postoperative infections. Cochrane Database Syst Rev. 2020;4:CD007892. https://doi.org/10.1002/14651858.CD007892.pub7
12. Ugadu IO, Egede JO, Nwigboji WN, Igwe CP, Nwali AS, Adebayo JA, Umeora OU. Pre-operative versus post-operative vaginal cleansing with povidone-iodine and post-caesarean infectious morbidity: a randomized controlled study. J West Afr Coll Surg. 2022;12(4):64–74. https://doi.org/10.4103/jwas.jwas_159_22
13. Barbieri RL. Should you adopt the practice of vaginal cleansing with povidone iodine prior to caesarean delivery? OBG Manag. 2016;28:8–15.
14. Liu G, Liang J, Bai L, Dou G, Tan K, He X, Zhang J, et al. Different methods of vaginal preparation before cesarean delivery to prevent postoperative infection: a systematic review and network meta-analysis. Am J Obstet Gynecol MFM. 2023;5(8):100990. https://doi.org/10.1016/j.ajogmf.2023.100990
15. Betran AP, Ye J, Moller AB, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. BMJ Glob Health. 2021;6(6):e005671. https://doi.org/10.1136/bmjgh-2021-005671
16. Kiani SA, Zafar M, Yasmin S, Mazhar SB. Vaginal cleansing prior to cesarean section and post-operative infectious morbidity. J Soc Obstet Gynaecol Pak. 2018;8(2):95–99.
17. Abrar S, Sayyed E, Hussain SS. Vaginal cleansing before emergency cesarean section and post-operative infectious morbidity: a clinical trial in a low-resource setting. J Postgrad Med Inst. 2023;37(1):12–15. https://doi.org/10.54079/jpmi.37.1.3114
18. El Sharkawy S, Amin M, Mansy A. Effect of preoperative vaginal antiseptic on occurrence of postoperative infection in cesarean section. Evid Based Womens Health J. 2022;12(3):278–283. https://doi.org/10.21608/ebwhj.2022.140071.1177
19. Elsayed Negm AA, Naeem W. Vaginal cleansing with povidone iodine before elective caesarean section at Benha University Hospitals. Egypt J Hosp Med. 2023;93(1). https://doi.org/10.21608/ejhm.2023.320367
20. Soliman Ahmed Mohamed S, Samir Faheem A, Fawzy Elsayed Ali H. Effect of vaginal cleansing with povidone iodine solution before cesarean section on postoperative endometritis infection. Egypt J Health Care. 2021;12(2):630–643. https://doi.org/10.21608/ejhc.2021.167097
21. Al Budairi ZJ, Al-Zaidy HF, Hadi MS. Preoperative vaginal wash with povidone iodine solution to reduce post-caesarean infectious morbidity. Peer Rev Int J. 2023;26:116–123. https://doi.org/10.62480/tjms.2023.vol26.pp116-123
22. Parveen T, Faheem S, Hasan S, Rasool MG. Postoperative vaginal cleaning with povidone solution and reduction in the rate of endometritis and wound infection. Acta Sci Womens Health. 2025;7(8):4.

.