Vaginal Preparation with Povidone Iodine and Postcesarean Infectious Morbidity: A Retrospective Trial

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OBJECTIVE: The aim of the study was to evaluate the effect of preventing development of postpartum infections by vaginal preparation with povidone iodine before cesarean delivery, with a retrospective file scanning.

STUDY DESIGN: This study included 250 pregnant women undergoing cesarean delivery, who applied our clinic between the dates 2010-2011. All women received the standard antibiotic prophylaxis, 1 gr cefazolin iv before 30 minutes from the operation. Patients were investigated in two groups, vaginal cleansing with povidone iodine before cesarean delivery (126 case) or no cleansing (124 case), the groups compared with presence of postoperative fever endometritis and wound infection.

RESULTS: Demographic characteristics of two groups were similar. There were no differences in age, height, weight, BMI, time of pregnancy, number of prior cesarean delivery, preoperative-postoperative time of staying in hospital, preoperative - postoperative hemoglobin values ($p>0.05$); there was only statistically significant difference in operating time ($p<0.05$). Analyzing the distribution of postoperative fever, there was only one case in vaginal cleansing group and four cases in the other group. There was no statistically significant difference between the groups ($p>0.05$). Comparing the two groups with postoperative wound infection, there is only one case in vaginal cleansing group and three cases in the other group. There is no statistically significant difference between the groups ($p>0.05$). Because of absence of endometritis in two, groups, we could not assess efficiency of vaginal cleansing in postpartum endometritis. No statistically significant difference was determined between the groups, in postoperative fever and postoperative wound infection ($p>0.05$).

CONCLUSIONS: Vaginal cleansing with povidone iodine before cesarean delivery may decrease postoperative fever and wound infection morbidities, although this is not statistically significant.

Key Words: Cesarean delivery, Postpartum fever, Postpartum endometritis, Postpartum wound infection

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Introduction

Cesarean section (CS) continues to be the surgical intervention most often performed in obstetrics, with a daily increasing frequency of use. Its incidence has increased from 5% to 35% in the last 35 years.[1] Even though its frequency varies from one country to the other, this increase is registered across the planet.

Along with its use, its postoperative complications are also increasing; intensive research on the prevention of such complications is being conducted. Infectious morbidity plays an important role among such postoperative complications. The most important risk factor for postpartum maternal infection remains the performance of CS. The risk for all postpartum infections is increased in CS compared to vaginal delivery. Infectious complications developing in the aftermath of CS are one of the main causes of maternal morbidity; they coincide with a conspicuous increase of the hospital stay duration.[3]

Such infectious complications include fever, wound infection, endometritis, bacteremia, pelvic abscess, septic shock, necrotizing fasciitis, septic pelvic thrombophlebitis and urinary tract infection.[4]

The prophylactic use of antibiotics may substantially reduce the postoperative infectious morbidity of CS.[5] The use of such antibiotic prophylaxis is widespread in our days.

Postpartum infectious morbidity is mostly a polymicrobial condition due to the micro-organisms in the lower genital area of the host. This are is the main way of entry of micro-organisms responsible for post-cesarean infection, especially in the case of a rupture of the amniotic membrane. The microbial invasion of the intrauterine cavity also occurs with intact amni-

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otic membranes.[6] The possibility of reducing infectious morbidity by the application of antiseptic solutions to the vagina or the topical vaginal use of antibiotics is the subject of ongoing studies. In addition to the relative scarcity of published, randomized controlled studies, these also show varying results.[7-9,10-13]

This study aimed at investigating retrospectively the efficacy of a preoperative vaginal application of povidone iodide in preventing postoperative fever, endometritis and wound infection.

Material and Method

Pregnant women who gave birth by CS after seeking medical assistance in years 2010 and 2011 at the Ondokuz Mayıs University Medical School Gynecology and Obstetrics Polyclinic were included in this study. Patients with the following conditions were excluded from this retrospective study: women already in labor or with cervical dilatation, diabetes mellitus, morbid and ordinary obesity (body mass index BMI>30), early rupture of membranes, cesarean hysterectomy, eclampsia, placental abruption, placenta previa, chorioamnionitis, active genital herpes infection, more than one pelvic examination, cervical dilatation performed during the operation and preoperative evidence of infection.

The 250 patients in the study population were divided in two groups according to their having had (Group A=126 patients) or not having had (Group B=124 patients) a vaginal application of the antiseptic. Following routine cleaning and 10 minutes before surgery, 10% povidone iodide applied with two successive sponges to all vaginal walls and the fornices to all patients in Group A. Group B patients had underwent routine cleaning. All patients had received a single dose of cefazolin, 1 g i.v. as antibiotic prophylaxis. All patients underwent surgery through a pfannenstiel incision. Preoperative body temperature had been noted in all. The patients were evaluated for the presence absence of fever, endometritis and wound infection.

Age, height, weight, pregnancy history (gravidity, parity, miscarriages, and number of live children), pregnancy week, number of previous CS, indications for CS and history of abdominal surgery were noted. Preoperative and postoperative length of hospital stay, hemoglobin level on the second preoperative and second postoperative days, surgery duration, intraoperative and postoperative body temperature, child weight and Apgar score at delivery was also recorded.

The measurement of a body temperature >38 °C twice at an interval of 4 hours at least, on any day except that of the surgery was defined as presence of fever. Uterus tenderness and foul-smelling vaginal discharge were accepted as indicating the presence of endometritis in the presence of fever. The development of any infection in the surgical incision was accepted as wound infection.

The SPSS 16.0 software package was used for statistical evaluation; categorical valuables were compared by the chi-squared test and continuous variables by Student's t-test. A p-value <0.05 was accepted as statistically significant.

Results

There was no difference between the groups as to the distribution of patient characteristics, i.e. age, parity, week of pregnancy, weight, height, BMI, duration of hospital stay and number of prior CS (p>0.05). A difference between the two groups with regard to the duration of surgery was, however, significant, being longer in Group A (Table 1).

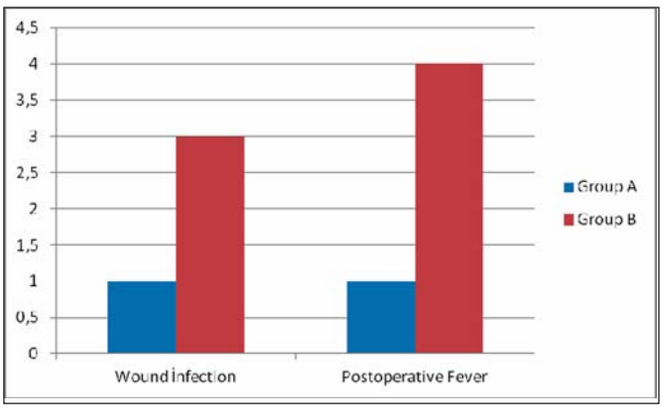
Table 1: The demographic characteristics of Group B and Group A

Characteristics of Participants	Group	Mean Average	P
Age	Grup A(126)	29.59	>0.05
	Grup B(124)	29.11	
Weight	Grup A	73.516	>0.05
	Grup B	71.629	
Height	Grup A	163.074	>0.05
	Grup B	162.7661	
Body Mass Index	Grup A	27.4833	>0.05
	Grup B	26.9839	
Date of pregnancy	Grup A	262.24	>0.05
	Grup B	262.65	
Number of previous cesarean	Grup A	,80	>0.05
	Grup B	,56	
Time of Hospitalization (preoperative)	Grup A	1.33	>0.05
	Grup B	1.06	
Time of Hospitalization (postopeative)	Grup A	3.06	>0.05
	Grup B	2.91	
Preoperative Hemoglobine	Grup A	11.7183	>0.05
	Grup B	117694	
Postoperative second day Hemoglobine	Grup A	10.0556	>0.05
	Grup B	10.0250	
Operation Time	Grup A	46.63	<0.05
	Grup B	43.55	

The principal indications to CS in Group A were, in the order of frequency, repeated CS in 61 (48.4%) patients, narrow pelvis in 17 (13.5%) and cephalo-pelvic disproportion (CPD) in 13 (10.3%). In Group B these indications were repeated CS in 47 (37.9%) patients, narrow pelvis in 23 (18.5%) and CPD in 12 (9.7%). These distributions were statistically similar (p>0.05).

The two groups were compared for their history of abdominal surgery; 16 were positive out of 126 patients in Group A and 16 out of a total of 124 patients in Group B, with respectively 110 and 108 negative; without a statistically significant difference between the two (p>0.05).

Postoperative occurrence of fever was noted in one Group A patient and four in Group B, not a statistically significant difference (p>0.05) (Table 2). No postpartum endometritis was seen in either group. Surgical wound infection had been recorded in only one case in Group A as compared to three in Group B (Graphic 1), a difference not found significant (p>0.05) (Table 3).



Graphic 1: Wound Infection and postoperative fever in Groups

Discussion

The continually increasing frequency of CS in our time brings with it an increase in the incidence of several complications, first among them postoperative infections. The development of endometritis post CS is most frequently due to the invasion of the uterus by pathogenic micro-organisms. Published studies have shown that severe anemia, intrapartum internal monitoring and antenatal genito-urinary infection are correlated with an increased risk of developing endometritis.[7] Different efforts have been made to reduce infection. The results of studies on the efficacy of cleaning the vagina with antiseptic solutions seem to be contradictory.[8-10]

In our study, patients who underwent CS for different reasons were evaluated in groups: those who had received a preoperative application of povidone (Group A) and those who had not (Group B). Patients in both groups had been administered antibiotic prophylaxis with cefazolin, 1 g iv. preceding the operation. Patients with early rupture of membranes and those with chorioamnionitis were kept outside the study. We paid particular attention to keeping the operative team and the surgical procedure identical for all patients; in particular, performance of the interventions by the same surgical team ensured similarity of procedure for all patients, from the abdominal access to peritoneal closure. A difference between groups in surgical technique which could explain any differences in postoperative results is thus not considered.

Table 2: The distribution of postoperative fever of group A and group B

Postoperative Fever			Group A	Group B	Total	P
	No	Number of cases	125	120	245	
		%Postoperative fever	51.0%	49.0%	100.0%	>0.05
		% Vaginal Preparation	99.2%	96.8%	98.0%	
	Yes	Number of cases	1	4	5	
		%Postoperative fever	20.0%	80.0%	100.0%	>0.05
		% Vaginal Preparation	.8%	3.2%	2.0%	
Total		Number of cases	126	124	250	
		%Postoperative fever	50.4%	49.6%	100.0%	
		% Vaginal Preparation	100.0%	100.0%	100.0%	

Table 3: The distribution of postoperative wound infection in groups

Wound Infection			Group A	Group B	Total	p
	No	Number of cases	125	121	246	
		% Wound Infection	50.8%	49.2%	100%	>0.05
		% Vaginal Preparation	99.2%	97.6%	98.4%	
	Yes	Number of cases	1	3	4	
		% Wound Infection	25.0%	75.0%	100.0%	>0.05
		% Vaginal Preparation	.8%	2.4%	1.6%	
Total		Number of cases	126	124	250	
		% Wound Infection	50.4%	49.6%	100.0%	
		% Vaginal Preparation	100.0%	100.0%	100.0%	

No postpartum endometritis was identified in either group. Postoperative fever was seen in 0.8% of the group given vaginal antisepsis and 3.2% of the group who had not. As for the frequency of surgical wound infection, it was respectively 0.8% and 2.4%. A difference, albeit statistically non-significant, was thus observed in postoperative fever and wound infection, favoring vaginal antisepsis. Our results are similar to those published by Reid and Haas, who had similarly observed relatively fewer cases of postoperative fever and wound infection in the group given vaginal antiseptic application.[11,12] Studies of various measures aiming to reduce post-CS infections are still ongoing. Among these, that of Sekhavat et al. compared the preoperative vaginal application of metronidazole gel to placebo. While the febrile morbidity and endometritis rate was 3.4% in the treated group, this proportion reached 11% in the placebo group. It was shown that vaginal topical application of metronidazole diminishes the frequency of postpartum endometritis.[9] Pitt et al. studied the efficacy of the pre-CS intravaginal application of metronidazole in 224 cases. The respective endometritis rates were found to be 7% and 17% in the intravaginal metronidazole and placebo groups, a difference demonstrated to be significant.[13]

There are, however, studies suggesting that vaginal antisepsis is useless as it does not reduce the infective risk. Vaginal cleaning using an antiseptic solution leads to a reduction in the total aerobic and anaerobic micro-organism counts. Even though such a reduction is established 10 minutes after the application, it has also been shown that the micro-organism count reaches half the pre-treatment level within as little as 2 hours from the application.[14] Rouse et al. report that antisepsis of the vagina with chlorhexidine prior to CS does not reduce postpartum infections.[15]

Our study shows that infective morbidity following CS might be reduced by preoperative vaginal application of povidone iodide. An additional vaginal cleaning before a CS, following the abdominal preparation, is an easy manipulation that can be performed after regional anesthesia and the introduction of the Foley catheter.

An accompanying administration of antibiotics would reduce the bacterial invasion of myometrial tissue. Vaginal povidone administration is cheap, well tolerated and short. Thus, better-powered new clinical studies are needed to establish if vaginal antiseptic application before CS may achieve a reduction in the incidence of infections.

Vajinanın Povidon İyodürle Yıkanmasının Sezaryen Sonrası Enfeksiyöz Morbiditeye Etkisi: Retrospektif Bir Klinik Çalışma

AMAÇ: Sezaryen öncesi vajinanın povidon iyodür ile yıkanmasının postpartum enfeksiyon gelişimini önlemedeki etkisini tespit etmek.

GEREÇ VE YÖNTEM: Çalışmaya Ondokuz Mayıs Üniversitesi Tıp Fakültesi Hastanesi Kadın Hastalıkları ve Doğum Polikliniği'ne 2010-2011 tarihleri arasında başvuran sezaryen ile doğum yapmış 250 gebe dahil edildi. Çalışmadaki gebelerin, 126 tanesine vajinal povidon iyodür ile yıkama yapıldı (Grup A=çalışma grubu), 124 tanesine ise vajinal yıkama yapılmadı (Grup B= kontrol grubu). Tüm gebelere rutin olarak tek doz 1 gr sefazolin iv antibiyotik profilaksisi uygulandı. Olgular postoperatif ateş, endometrit ve yara yeri enfeksiyonu açısından retrospektif olarak değerlendirildi.

BULGULAR: Grup A ve Grup B'deki hastaların demografik özelliklerinin dağılımı karşılaştırıldığında yaş, kilo, boy, BMI, gebelik süresi, önceki sezaryen sayısı, preoperatif hastanede kalış süreleri açısından gruplar arasında fark yoktu. Yine grupların postoperatif hastanede kalış süresi ve hemoglobin değerleri arasında farklılık bulunmadı (p>0,05). Ancak A ve B grubu arasında operasyon süreleri açısından istatistiksel olarak anlamlı bir farklılık olduğu görüldü (p<0,05). Her iki grupta da postpartum endometrit saptanmadı.

Postoperatif ateş dağılımı karşılaştırıldığında Grup A da sadece 1 olguda, Grup B de ise 4 olguda postoperatif ateş saptandı. Yara yeri enfeksiyonu Grup A da yalnızca 1 hastada, Grup B de ise 3 hastada görüldü. Ancak gruplar arasında görülen bu farklılığın anlamlılığı istatistiksel olarak gösterilemedi (p> 0,05).

SONUÇLAR: Sezaryen öncesi vajinanın povidon iyodür ile yıkanması istatistiksel olarak anlamlı düzeyde olmasada postoperatif ateş ve yara yeri enfeksiyonu gelişimini azaltmaktadır.

Anahtar Kelimeler: Sezaryen, Postpartum ateş, Endometrit, Yara enfeksiyonu

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