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A Study on Effectiveness of Preoperative versus Postoperative Misoprostol Administration in caesarean section to Evaluate Primary Postpartum Hemorrhage

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ABSTRACT

Background: Caesarean section (CS) is a frequently performed as a surgical operation, accounting for approximately one-third of all such procedures. Cesarean section rates continue to grow year after year around the world. A Caesarean section can cause a number of maternal and foetal lethal complications, the most serious of which is postpartum haemorrhage (PPH)

Aim of the work: To examine the safety and efficacy of preoperative vs postoperative misoprostol for reducing postpartum bleeding after cesarean surgery.

Patients and methods: This prospective single-blinded study included 100 women administrated for cesarean section. They had been randomly assigned to either the preoperative misoprostol or postoperative misoprostol, . The study had been conducted at Obstetrics and Gynecology department, Al Hussein University Hospital.

Results: Postoperative Hematocrit level (24 hours post-cesarean section) in the Preoperative Misoprostol Group was ranged between 32.20 and 35.00 with a mean ± S.D. 33.55±0.701 while in the Postoperative Misoprostol Group ranged between 28.0 and 31.0 with a mean ± S.D. 29.29±0.782. There were statistically significant variations in the results between the two groups where P<0.001.

Conclusion: Preoperative misoprostol can be used to avoid excessive intraoperative and immediate postoperative blood loss.. Pregnancy procedures with a high potential for harm should have access to it. It is safer and more effective to provide misoprostol in CS before to incision than after administration to prevent loss of blood during cesarean section and to function as a prophylactic uterotonic to prevent postpartum hemorrhage after cesarean sections.

Keywords: *Caesarean section; Misoprostol; Postpartum Hemorrhage.*

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INTRODUCTION

As one of the most regularly performed surgical procedures, a Caesarean section (CS) may be found all over the world. Every year, the number of C-sections performed throughout the world rises. A main postpartum hemorrhage may result from a caesarean section, which is a dangerous complication for both the mother and the baby (PPH).[1]

In the case of a caesarean delivery, a cumulative bleeding of more than 1000ml is described as PPH or any loss of blood happening during the first 24 hours after birth, which is followed by a rise in pulse rate and a fall in blood pressure, as demonstrated by an increase in pulse rate. [2]

Low- and middle-income countries had the greatest rates of maternal mortality associated to PPH, accounting for 480 000 (32 percent) of all fatalities in northern Africa, compared to just 1200 (8 percent) in industrialised countries. In the poor countries, PPH is the primary cause of maternal mortality. [3]

When uterotonic medicines are taken during the third stage of labour, the risk of postpartum haemorrhage, anemia, and the requirement for blood transfusions is decreased. Oxytocin, ergometrine, and prostaglandins are the most often utilized uterotonic medicines. [4]

Known as a synthetic prostaglandin E1, misoprostol is a medication that is widely used to control the third

stage of labor when all other medical therapies have been unsuccessful.[5]

The risk of postpartum hemorrhage, anemia, and the requirement for blood transfusions is lowered when uterotonic medicines are used to treat the third stage of labour. Oxytocin, ergometrine, and prostaglandins are the most often utilized uterotonic medicines. [1]

So in this study; we aimed to see how safe and effective preoperative vs. postoperative misoprostol was for minimizing postpartum hemorrhage following caesarean surgery.

PATIENTS AND METHODS

This prospective single-blind research comprised 100 women who were scheduled for a caesarean section. They had been randomised at random to either preoperative or postoperative misoprostol, with only the staff knowing which patients were on which regimen. The research was carried out in the Obstetrics and Gynecology department of Al Hussein University Hospital.

The mother's age ranged from 18 to 35 years old, the pregnancy was at term (37-40 weeks), the caesarean section was performed under regional anaesthetic, the pregnancy was a singleton, and there were no contraindications to the procedure.

Exclusion criteria include: Caesarean section performed under general anaesthesia, antepartum haemorrhage, maternal hypertension, anaemia, coagulation abnormalities, two or more prior caesarean sections, multiple gestations, foetal macrosomia, polyhydramnios, past uterine rupture, and diabetic patients.

Operational design: Before the research began, all women participating in the experiment were told about the procedure, and written permission was acquired from all patients, along with counselling about the study's risks and benefits.

Randomization and allocation: A computer-generated random table was used for randomization. Eligible patients were randomised at random to one of two trial groups. The concealment of allocation was determined using serially numbered closed opaque envelopes. Each envelope was tagged with a serial number and a card indicating the kind of intervention. Once the allocation was made, it was not modified.

Methods:

Patients were submitted to the following procedures: full history taking: Name, age, residence, phone number, education level, employment, marital status, years of marriage, consanguinity, number of children, age of youngest kid, and any unique habits of medical concern were all part of the personal history. Menarche, regularity of menses, duration of monthly bleeding, length of cycle, quantity, the existence of pain and its relationship to bleeding, any irregular bleeding and kinds, and the duration of contraceptive techniques she had used were all part of her menstrual history. Gravidity, parity, time, type, and location of previous delivery, number of children, detailed history of preterm births (regarding gestational age, possible cause, method of labour, management she received, and any complications), abortion (regarding gestational age, possible cause, treatment received, method of termination, any complication that occurred in the post abortive period, and time of last abortion), last menstrual period, expected day of labour

Examination: Overall, the examination: Assessment of vital signs, weight, height (BMI), abdomen, and local clinical examination: To determine the fundal level and age of gestation, as well as any clinically visible abdominal or pelvic disease, previous operation scars, masses, pain, or stiffness, and any clinically visible abdominal or pelvic disease.

Investigations: According to hospital policy, laboratory investigations

Routine ultrasound for foetal weight estimation (EFW), as well as umbilical and middle cerebral resistance index Doppler studies.

EFW was calculated using foetal biparietal diameter, abdominal circumference, and femoral length.

Group I (Preoperative Misoprostol): Two tablets of misotac (each tab containing 200 mcg of misoprostol) were administered rectally after regional anaesthesia and immediately before skin incision.

Group II (Postoperative Misoprostol): Following the Caesarean procedure, I was given rectally two misotac tablets (each tablet containing 200 mcg of misoprostol).

The following procedures had been performed on all patients: All patients get the same treatment regimen, including intraoperative oxytocin after foetal delivery, as well as antibiotics and painkillers. All patients are assessed to see if they need further uterotonics such as oxytocin, additional anti-fibrinolytic medicines, or blood transfusions. Blood pressure, pulse, and temperature were all monitored after delivery. Throughout the hospitalisation and within the first 24 hours after a caesarean delivery, haemoglobin and hemocrit levels are measured and reported. At this point, patients were evaluated for any issues or side effects from the drugs they were given, such as stomach pain, vomiting, diarrhoea, shivering, and pyrexia.

We used the following formulas to estimate blood loss: Blood loss (in volume units) is computed by dividing the patient's estimated blood volume by the change in haemoglobin (or haematocrit).

Ethical Consideration: The Institutional Review Board (IRB) of Al-Azhar University's faculty of medicine has approved the study procedure. Each participant has given informed Signed agreement to participate in the investigation. Confidentiality and personal privacy were upheld throughout the study.

Statistical analysis:

The Microsoft Excel application is used for data management and statistical analysis. This programme is used to code, input, and analyze information gathered throughout the history-taking process, the basic clinical examination, laboratory testing, and

outcome assessments, among other things For further analysis and assessment, To analyze the data, it was loaded into SPSS version 20.0. Depending on the type of information (qualitative data represented as numbers and percentages, quantitative data represented as mean and SD), Tests used to determine whether or not variations were statistically significant: The methods for determining correlation are Pearson's correlation and Spearman's correlation.

RESULTS

Age	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	20-35	18-35	4334.50	0.103
Mean± S.D	27.99±4.890	26.87±4.532		

U: Mann- Whitney test
p: p value for comparing the two groups under investigation
*: Statistically important at P <0.05

Table 1: A comparison of two groups as regard to patient's age (years)

Age in Preoperative Misoprostol Group was ranged between 20-35 years with mean ± S.D. 27.99±4.890 years while in Postoperative Misoprostol Group was ranged between 18-35 years with mean ± S.D. 26.87±4.532 years. No statistically significant variations existed between the groups where P=0.103. Table (1)

Gestational age at delivery (weeks)	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	37-40	37-40	4720.00	0.478
Mean± S.D	38.52±1.105	38.63±1.079		

U: Mann-Whitney test
p: p value for comparing between the two studied groups
*: Statistically important at P <0.05

Table 2: Comparison between two groups as regard to patient's gestational age at delivery (weeks)

Gestational age (weeks) at delivery in Preoperative Misoprostol Group was ranged between 37-40 weeks with mean±S.D. 38.52±1.105 weeks while in Postoperative Misoprostol Group was ranged between 37-40 weeks with mean±S.D. 38.63±1.079 weeks. There was no statistically significant differences between groups where P=0.478.Table (2)

Parity	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	0-2	0-2	4703.00	0.378
Mean± S.D	1.35±0.500	1.29±0.478		

p: p value for comparing between the two studied groups
*: Statistically important at P <0.05

Table 3: Comparison between two groups as regard to patient's parity

Parity in Preoperative Misoprostol Group was ranged between 0-2 with mean±S.D. 1.35±0.500 while in Postoperative Misoprostol Group was ranged between 0-2 with mean±S.D. 1.29±0.478. There was no statistically significant change among groups where P=0.378. Table (3)

Preoperative Hematocrit level	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	23.60-46.80	28.50-41.80	4929.00	0.862
Mean± S.D	35.91±4.520	35.78±2.412		

U: Mann- Whitney test
p: p value for comparing between the two studied groups
*: Statistically significant at P <0.05

Table 4: Comparison between two groups as regard to patient's Preoperative Hematocrit level

Preoperative Hematocrit level in Preoperative Misoprostol Group was ranged between 23.60-46.80 with mean±S.D. 35.91±4.520 while in Postoperative Misoprostol Group was ranged between 28.50-41.80 with mean±S.D. 35.78±2.412. There was no statistically significant differences between groups where P=0.862. Table (4)

Operative Time	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	40-60	40-65	3919.50	0.007*
Mean± S.D	52.20±6.409	55.00±7.687		

U: Mann- Whitney test
p: p value for comparing the two groups under investigation
*: Statistically significant at P <0.05

Table 5: A comparison of two groups as regard to patient's Operative Time

Operative Time in Preoperative Misoprostol Group was ranged between 40-60 minutes with mean ± S.D. 52.20±6.409 minutes while in Postoperative Misoprostol Group was ranged between 40-65 minutes with mean ± S.D. 55.00±7.687 minutes. There were statistically significant variations in the results between the two groups where P=0.007. Table (5)

Operative blood loss (ml)	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	364-388	663-841	0.00	<0.001*
Mean± S.D	375.92±7.334	762.56±51.988		

U: Mann- Whitney test

p: p value for comparing the two groups under investigation

*: Statistically important at P <0.05

Table 6: A comparison of two groups as regard to patient's operative blood loss

Operative Time in Preoperative Misoprostol Group was ranged between 364-388 ml with mean ± S.D. 375.92±7.334 ml while in Postoperative Misoprostol Group was ranged between 663-841 ml with mean ± S.D. 762.56±51.988 ml. There were statistically significant variations in the results between the two groups where P<0.001. Table (6)

Need for additional measures	Group I (Preoperative Misoprostol) (no = 100)		Group II (Postoperative Misoprostol) (no = 100)		P Value
	No.	%	No.	%	
Additional Oxytocin	0	0.0	28	28.0	<0.001*
Hemostatic drug	0	0.0	35	35.0	<0.001*
Blood transfusion	0	0.0	6	6.0	0.029*

p: p value for comparing the two groups under investigation

*: Statistically significant at P <0.05

Table 7: A comparison of two groups as regard to patient's Need for additional measures

Need for additional measures in Preoperative Misoprostol Group show that all patients didn't need any additional measures while in postoperative Misoprostol Group 28(28.0%) Need Additional Oxytocin, 35(35%) need Hemostatic drug and 6(6%) need Blood transfusion. There were statistically significant variations in the results between the two groups Table (7)

Postoperative blood loss (24 hours post-caesarean section)	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	116-270	181-327	1141.50	<0.001*
Mean± S.D	190.52±30.629	237.28±23.567		

U: Mann- Whitney test

p: p value for comparing the two groups under investigation

*: Statistically important at P <0.05

Table 8: A comparison of two groups as regard to patient's postoperative loss of blood (24 hours post-caesarean section)

Postoperative loss of blood (24 hours post-caesarean section) in Preoperative Misoprostol Group was ranged between 116-270 with mean ± S.D. 190.52±30.629 while in Postoperative Misoprostol Group was ranged between 181-327 with mean ± S.D. 237.28±23.567. There were statistically significant variations in the results between the two groups where P<0.001. Table (8)

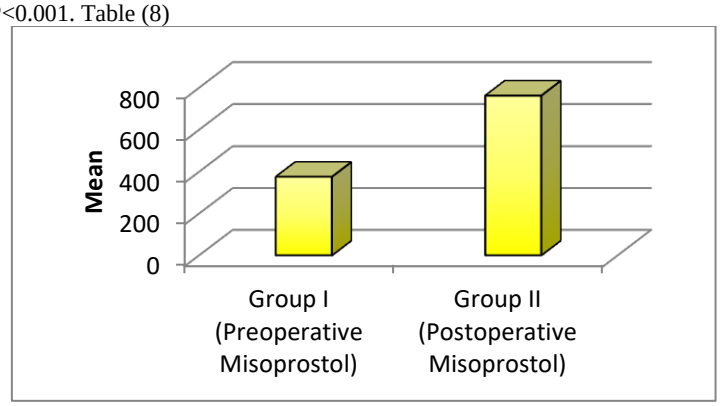

Fig. 1: Comparison between two groups as regard to patient's operative blood loss.

Postoperative Hematocrit (24 hours post-caesarean section)	Group I (Preoperative Misoprostol) (no = 100)	Group II (Postoperative Misoprostol) (no = 100)	U	P Value
Min.-Max.	32.20-35.00	28.0-31.0	0.00	<0.001*
Mean± S.D	33.55±0.701	29.29±0.782		

U: Mann- Whitney test
p: p value for comparing the two groups under investigation
*: Statistically important at P <0.05

Table 9: A comparison of two groups as regard to patient's Postoperative Hematocrit level (24 hours post-caesarean section)

Postoperative Hematocrit level (24 hours post-caesarean section) in Preoperative Misoprostol Group was ranged between 32.20-35.00 with mean ± S.D. 33.55±0.701 while in Postoperative Misoprostol Group was ranged between 28.0-31.0 with mean ± S.D. 29.29±0.782. There were statistically significant variations in the results between the two groups where P<0.001. Table (9)

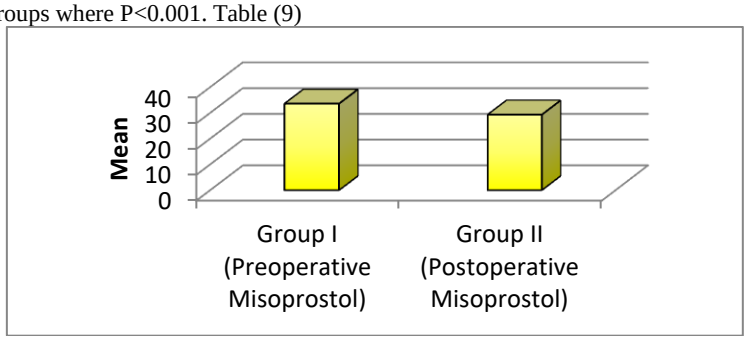

Fig. 2: Comparison between two groups as regard to patient's Postoperative Hematocrit level (24 hours post-caesarean section)

Side effect	Group I (Preoperative Misoprostol) (no = 100)		Group II (Postoperative Misoprostol) (no = 100)		P Value
	No.	%	No.	%	
Abdominal pain	5	5.0	9	9.0	0.407
Hyperthermia	7	7.0	12	12.0	0.335
Chills	4	4.0	6	6.0	0.748
Vomiting	3	3.0	5	5.0	0.721

p: p value for comparing the two groups under investigation
*: Statistically significant at P <0.05

Table 10: A comparison of two groups as regard to patient's Side effect

Side effect in Preoperative Misoprostol Group show 5(5%) had abdominal pain, 7(7%) had hyperthermia, 4(4%) had chills and 3(3%) had vomiting while in postoperative Misoprostol Group 9(9%) had abdominal pain, 12(12%) had hyperthermia, 6(6%) had chills and 5(5%) had vomiting. No statistically significant variations existed between the groups. Table (10).

DISCUSSION

A vast number of research investigations were undertaken in order to determine the efficacy of rectal misoprostol as a postpartum haemorrhage prevention strategy. There have been a number of studies that support the use of misoprostol to reduce postpartum haemorrhage in women who have recently given birth. However, others have found that it is not as effective as previously thought. Other studies has shown that the use of misoprostol should be ceased.[6]

Our study showed that: Age in Preoperative Misoprostol Group was ranged between 20-35 years with mean ± S.D. 27.99±4.890 years while in Postoperative Misoprostol Group was ranged between 18-35 years with mean ± S.D. 26.87±4.532 years. No important variation variations existed among the groups where P=0.103.

Preoperative Hematocrit level in Preoperative Misoprostol Group was ranged between 23.60-46.80 with mean ± S.D. 35.91±4.520 while in Postoperative Misoprostol Group was ranged between 28.50-41.80 with mean ± S.D. 35.78±2.412. No statistically significant variations existed between the groups where P=0.862

Indications of CS in Preoperative Misoprostol Group show that 46(46.0%) their indication was Malpresentation, 42(42.0%) their indication was Previous CS, 7(7.0%) their indication was Maternal request and 5(5%) their indication was Oligohydramnios while in postoperative Misoprostol Group 41(41.0%) their indication was Malpresentation, 40(40.0%) their indication was Previous CS, 13(13.0%) their indication was Maternal request and 6(6%) their indication was Oligohydramnios. No statistically significant variations existed between the groups where P=0.527.

Operative Time in Preoperative Misoprostol Group was ranged between 40-60 minutes with mean ± S.D. 52.20±6.409 minutes while in Postoperative Misoprostol Group was ranged between 40-65 minutes with mean ± S.D. 55.00±7.687 minutes. There were statistically significant variations between groups where P=0.007.

Operative Time in Preoperative Misoprostol Group was ranged between 364-388 ml with mean ± S.D. 375.92±7.334 ml while in Postoperative Misoprostol The participants were divided into two groups 663-841 ml with mean ± S.D. 762.56±51.988 ml. There were statistically significant variations in the results between the two groups where P<0.001.

Need for additional measures in Preoperative Misoprostol Group show that all patients didn't need any additional measures while in postoperative Misoprostol Group 28(28.0%) Need Additional Oxytocin, 35(35%) need Hemostatic drug and 6(6%) need Blood transfusion. There were statistically significant variations in the results between the two groups.

In Dawood & Borg, [7] Additional oxytocin and hemostatic medicines were required in 30.49 percent and 36.58 percent of patients, respectively, in postoperative misoprostol group II, whereas these treatments were not necessary in preoperative misoprostol group I. Five instances (6.09 percent) in group II required blood transfusion, whereas none (0.00 percent) in group I required blood transfusion.

Abd-Ellah et al., [8] 53.3 percent of patients in the preoperative misoprostol group required extra uterotonics, in comparison to 30% in the postoperative misoprostol group.

Conde-Agudelo et al., [9] To estimate effectiveness and safety of using misoprostol as a prophylaxis during a caesarean birth to reduce intraoperative and postpartum haemorrhage, researchers conducted a comprehensive review and meta-analysis of randomized controlled trials. They consisted of 17 investigations in which 3174 women took part. Finally, they found that misoprostol plus oxytocin is more efficient than oxytocin in preventing intraoperative and postoperative bleeding after caesarean section.

Elsedeek, [10] At Alexandria University in Egypt, a research was done to compare the effectiveness of preoperative misoprostol treatment to placebo. She discovered that patients who received misoprostol preoperatively experienced a significant decrease in intraoperative and postoperative loss of blood (429 ± 234, 185 ± 95 ml) respectively, whereas patients who received placebo experienced an increase in intraoperative and postoperative loss of blood (620 ± 375, 324 ± 167 ml) respectively. She found preoperative misoprostol 400 g significantly decreases loss of blood associated with caesarean birth.

Postoperative loss of blood (24 hours post-caesarean section) in Preoperative Misoprostol Group was ranged between 116-270 with mean ± S.D. 190.52±30.629 while in Postoperative Misoprostol Group was ranged between 181 and 327 with mean ± S.D. 237.28 ± 23.567. There were statistically significant variations in the results between the two groups P<0.001.

Dawood & Borg, [7] revealed that preoperative misoprostol substantially reduced intraoperative blood loss, with a mean of 372.33 ± 25.997 ml compared to 722 ± 34.089 ml in the postoperative misoprostol group.

Abd-Ellah et al., [8] Following the outcomes of the study, a prospective study was conducted at Qena University in Egypt on 300 patients. Of the 300 participants, 150 were given misoprostol preoperatively and another 150 were given misoprostol postoperatively, according to the findings. In their study, they discovered that the loss of blood during caesarean section was significantly lower in the preoperative misoprostol group (620 ± 291 ml) than in the postoperative misoprostol group (898 ± 328 ml) with a statistically significant difference (p value less than 0.05) between the two groups between the two groups.

Ragab et al., [11] Researchers at Egypt's Mansoura University evaluated 348 individuals and discovered that preoperative misoprostol treatment resulted in less loss of blood (570 ± 240 ml) than postoperative misoprostol treatment (844 ± 270 ml).

Postoperative Hematocrit level (24 hours post-caesarean section) in Preoperative Misoprostol Group was ranged between 32.20-35.00 with mean ± S.D. 33.55±0.701 while in Postoperative Misoprostol Group was ranged between 28.0-31.0 with mean ± S.D. 29.29±0.782. There were statistically significant variations in the results between the two groups where P<0.001.

Dawood & Borg, [7] It was revealed that the postoperative misoprostol group saw a statistically significant drop in postpartum hematocrit levels compared to the preoperative misoprostol group. It is favourable to the patient to have less loss of blood after a caesarean section because it lowers the risk of postoperative morbidity and lowers the danger of blood transfusion.

Ragab et al., [11] The postoperative misoprostol group had considerably lower haemoglobin levels than the preoperative misoprostol group.

Side effect in Preoperative Misoprostol Group show 5(5%) had abdominal pain, 7(7%) had hyperthermia, 4(4%) had chills and 3(3%) had vomiting while in postoperative Misoprostol Group 9(9%) had abdominal pain, 12(12%) had hyperthermia, 6(6%) had chills and 5(5%) had vomiting. There were no statistically significant variations between groups.

Dawood & Borg, [7] the most often reported adverse effect, abdominal discomfort, showed a significant difference between the two groups (p value = 0.002), with three patients in group I and eight patients in group II reporting it. Four patients in group I and seven patients in group II had hyperthermia; two patients in group I and four patients in group II had chills; one patients in group I had vomiting; and one patients in group II had vomiting. During this time, there were no reports of diarrhea or headaches.

Chaudhuri et al., [12] found similar results. The effectiveness of rectally delivered misoprostol paired with an intravenous oxytocin infusion in avoiding uterine atony and loss of blood following caesarean delivery was studied in 2010.. Misoprostol significantly decreased intraoperative and postoperative blood loss, as well as postpartum haemorrhage, when compared to oxytocin. Shivering and postpartum haemorrhage were substantially less likely among misoprostol users than in the oxytocin group. However, there was no statistically important variation among the two groups in case of adverse effects.

Badejoko et al., [13] Compared to the administration of oxytocin and misoprostol alone, the scientists observed that misoprostol plus oxytocin treatment greatly decreased loss of blood during and after a caesarean surgery, with no noticeable adverse effects. They want to continue their research.

CONCLUSION

Excessive intraoperative and immediate post-operative bleeding can be avoided by administering misoprostol before the procedure. When it comes to high-risk obstetrics operations, it should be made available. It is safer and more effective to administer misoprostol prior to the incision of a caesarean section than it is to administer it postoperatively for reducing the amount of blood lost during the procedure.

Conflict of interest : none

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