



# Comparison of Pfannenstiel & Joel Cohen Cesarean Section Technique in Pregnant Women Referred to Mahzad Hospital

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## Research Article

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## Abstract

**Introduction:** Cesarean delivery can lead to higher costs and complications such as infection, bleeding, anemia, and the possibility of blood transfusion, hysterectomy, and infertility compared to normal delivery. Therefore, in this study, we want to compare the incidence of complications in cesarean section. Consider the Joel-Cohen and Pfannenstiel methods.

**Materials and Methods:** In this comparative study, 100 patients participated. All patients were randomly operated on by Pfannenstiel (n = 50) and Joel-Cohen (n = 50) methods. Time to start surgery until the fetus delivery, Time to start surgery until the end of the surgery, Number of blood-stained gases, Need to pethidine, As an indicator of postoperative pain, temperature above 37.8°C as fever and urinary residual more than 100 cc after urinary catheter withdrawal and after the first urination with nelaton catheter as urinary obstruction, among all Patients were compared.

**Results:** In this study. The mean age was 26.72±7.43 years old in the Pfannenstiel group and 21.44±6.51 years old in the Joel-Cohen group (P = 0.84). The mean body mass index (BMI) was 24.84 ± 2.48 Kg / m<sup>2</sup> in the Pfannenstiel group and 24.50 ± 3.14 Kg / m<sup>2</sup> in the Joel-Cohen group (P = 0.55). The mean gestational age in the Pfannenstiel group was 38.74 ± 1.58 weeks and in the Joel-Cohen group was 38.82 ± 1.58 weeks (P = 0.80). Fever and urinary obstruction were not seen in any of the patients. The mean duration of surgery, fetus delivery time, bleeding rate, length of hospital admission, and pain intensity after surgery was significantly higher in patients who underwent Pfannenstiel cesarean section, compared to the Joel-Cohen group.

**Conclusion:** Joel-Cohen method is preferable to a method in the cesarean section.

**Keywords:** Pfannenstiel; Joel-Cohen; Cesarean Section; Duration of Hospitalization; Fever

## Introduction

Cesarean section means cutting the lower surface of the abdomen and uterus to remove the baby and the placenta and membranes of the fetus [1,2]. Cesarean section is one of the oldest surgical methods [3] and also statistical studies show that today the most common obstetric surgery method used

in the world is the cesarean section [4-6]. The rate of cesarean section is from less than 5% in poor countries to more than 30% in developed countries [7]. In the United States in 2009, 1.3 million children were born by cesarean section, and it seems that in the future the rate of the cesarean section will increase due to the mother's request for cesarean section and the low probability of vaginal delivery after cesarean section

[8]. The rate of cesarean section in Iran is also high, so that according to the report of the World Health Organization, in 2008, 41.9% of deliveries were performed in this way [9]. This rate was 7% in 1970 [10]. Cesarean delivery is divided into two categories: elective and emergency, which have different indications such as breech presentation during the third trimester, twin pregnancy when the first fetus presentation is not cephalic, placenta previa, dystocia, and genital herpes, all of which are for the health of the mother, baby and or both [11]. On the other hand, fear of natural childbirth can also lead to women's desire for this method of childbirth [12]. Cesarean delivery can cost more than normal delivery and lead to complications such as infection (0.6% vs. 0.2%), bleeding, anemia, and the possibility of blood transfusion, hysterectomy, and infertility, the most important is bleeding [13-15]. These complications can reduce the quality of life of mothers due to stress, anxiety, and delays in improving the abilities and health of the mother [16]. Therefore, reducing the complications of this type of delivery is very important [17]. Although different surgical methods have been proposed for this surgery over the years, there is still no consensus on a specific method that will reduce morbidity [18].

Therefore, the choice of surgical method is more influenced by the surgeon's experience performance, and hospital conditions [18]. There are types of vertical midline and paramedian incisions and transverse incisions such as Pfannenstiel, Joel Cohen, Maylard, and Cherney [19]. Pfannenstiel was the first transverse incision to be used, with a horizontal incision 2cm above the pubic symphysis and scalpel separation of the subcutaneous tissue [20], while the Joel Cohen method was first used for hysterectomy, which was later used in cesarean section, which is a transverse incision, 3 cm lower than the hypothetical line connecting the upper anterior iliac spine on both sides [19]. In Joel Cohen's method, the peritoneum is opened with a transverse incision in the midline and then drawn with the finger (traction) [19]. Considering the mentioned characteristics for two transverse sections of Pfannenstiel and Joel-Cohen, which are among the most popular methods for cesarean section in the world and the lack of sufficient evidence and studies on the complications of these two methods in the Middle East and especially Iran, in this study we want to assess the incidence of complications in the two methods mentioned above.

## Materials and Methods

This double-blind randomized clinical trial study was performed on 100 term pregnant women referred to Kowsar Hospital who were candidates for cesarean section for any reason after the approval of the University Ethics Committee "umsu.erc.1390.4". Exclusion criteria were: a

history of previous cesarean section or laparotomy, multiple pregnancies, BMI greater than 30 and less than 18 kg/m<sup>2</sup>, transverse fetal presentation, and cesarean sections that required dislodge due to low fetal position. A questionnaire was completed for all patients and these patients were randomly operated on by two methods: Pfannenstiel (n = 50) and Joel-Cohen (n = 50). Descriptive statistics were used to examine the characteristics of the study population. T-test was used to compare the meantime of operation, the blood loss, and the number of contaminated gases at the operation site. The Chi-square test was used to compare qualitative variables in the two groups. In this study, all cesarean sections were performed by the same surgeon. The time from the start of surgery to the exit of the fetus and the time from the beginning of surgery to the end of surgery were measured and recorded by a chronometer and operating room staff outside the surgical field.

The number of blood-stained gases was measured and recorded by the operating room staff after the wall incision was completed. Each gas was considered equivalent to 20 cc of blood. In the midwifery ward, all patients have been prescribed 100 mg diclofenac suppository every 12 hours to 48 hours, and the need for pethidine injections was considered as an indicator of postoperative pain according to the patient's request and need. Temperatures above 37.8°C were considered as fever and urinary retention was considered as urinary residual more than 100 cc, which was measured after the urinary catheter was removed and after the first urination with the Nelaton catheter. Postoperative procedures were performed by a person who was unaware of the type of cesarean section.

## Results

In this study, 50 patients were in the Pfannenstiel method cesarean section and 50 patients in Joel-Cohen cesarean section. The cause of cesarean section in 100 patients was divided into two groups: Pfannenstiel and Joel-Cohen, was as follows: fetal heart deceleration(28%), breech presentation and labor pain (24%), CPD or dystocia (21%), meconium excretion (21%), labor pain and history of anterior-posterior colporrhaphy surgery (2%), placenta previa and labor pain (1%), large fetus (1%) and severe preeclampsia (2%). The mean age was 26.72 ± 7.43 years in the Pfannenstiel group and 21.44 ± 6.51 years in the Joel-Cohen group (P.value = 0.84). The mean body mass index (BMI) in the Pfannenstiel group was 24.84 ± 2.48 and in the Joel-Cohen group was 24.50 ± 23.14 Kg / m<sup>2</sup> (P. value = 0.55). The mean gestational age in the Pfannenstiel group was 38.74 ± 1.58 and in the Joel-Cohen group was 38.82 ± 1.58 weeks. There was no significant difference between the mean age of the two groups (P.value = 0.80). Fever was not reported in either group. Urine residue measured by catheterization after

voluntary urination was not reported positive in any of the individuals and groups of Pfannenstiel and Joel-Cohen. Therefore, the two groups were not different in terms of fever and urinary retention. In terms of duration of operation, the mean duration of surgery in Pfannenstiel cesarean section was  $36 \pm 6.16$  minutes and in Joel-Cohen cesarean section was  $26.06 \pm 5.21$  minutes. According to ( $P < 0.001$ ), there is a significant difference in terms of duration of operation between the two groups. The mean fetal delivery time in the Pfannenstiel method was  $5.80 \pm 1.03$  minutes and in the Joel-Cohen method was  $4.56 \pm 0.97$ . According to ( $P < 0.001$ ) there is a significant difference in terms of mean fetal delivery time between the two groups.

In terms of bleeding rate, the Pfannenstiel group

consumed an average of  $1.60 \pm 0.53$  gas (equivalent to  $1.06 \pm 32$  cc of blood) and the Joel-Cohen group consumed an average of  $1.20 \pm 0.4$  gas (equivalent to  $24 \pm 8$  cc of blood). There was a significant difference in terms of bleeding between the two groups ( $P$ .value  $< 0.001$ ). The mean duration of hospitalization in the Pfannenstiel group was  $2.34 \pm 0.47$  days and in the Joel-Cohen group was  $2.18 \pm 0.38$  days on average. There was no significant difference in terms of length of hospitalization between the two groups ( $p$ .value =  $0.06$ ). Postoperative pain intensity was assessed by the amount of pethidine injected, with an average of  $2.5 \pm 0.9$  vials of pethidine in the Pfannenstiel group and an average of  $1.02 \pm 1$  vials of pethidine per patient in the Joel-Cohen group. There was a significant difference in pain intensity between the two groups ( $p$ .value  $< 0.001$ ) (Tables 1 & 2).

|                           | Joel- cohnen (50=n) | Pfannstiel(50=n) | p.value |
|---------------------------|---------------------|------------------|---------|
| age (mean±SD)             | 6.51 ±21.44         | 7.43±26.72       | 0.842   |
| gestational (mean±SD) age | 1.58 ±38.82         | 1.58 ±38.74      | 0.802   |
| BMI (mean±SD)             | 3.14±24.50          | 2.48±24.84       | 0.55    |

**Table 1:** Mean ± standard deviation of maternal age, gestational age, BMI in the two groups.

|  | Pfannenstiel (50=n) | Joel-cohen (50=n) | p.value |
|--|---------------------|-------------------|---------|
| Surgery time (mean±SD)                 | 6.16±36             | 5.21 ±26.06       | 0.001   |
| fetus delivery time(mean±SD)           | 1.03±5.80           | 0.97 ±4.56        | 0.001   |
| Number of gas consumed (mean±SD)       | 0.53±1.60           | 0.40±1.20         | 0.001   |
| hospitalization time (mean±SD)         | 0.47±2.34           | 0.38±2.18         | 0.069   |
| Number of the pethidines vial(mean±SD) | 0.9±2.50            | 1±1.02            | 0.001   |

**Table 2:** Comparison of the mean ±standard deviation of the two groups in terms of the studied indicators.

## Discussion

In this study, the mean duration of surgery and fetal delivery time in the Joel-Cohen method was significantly lower than the Pfannenstiel method. Also, the average amount of bleeding caused by the Joel-Cohen method was significantly less. In this study, the length of hospital admission and postoperative pain intensity of patients who underwent Joel-Cohen surgery was significantly shorter than the other group. In a prospective study, the incidence of nosocomial infections and endometritis was higher in patients who underwent Joel-Cohen surgery than in patients who underwent Pfannenstiel surgery (4.5% vs. 3.3% and 0.8% vs. 0.3%). Due to the presence of several risk factors such as emergency delivery, first cesarean section, more blood loss is equal to 800 ml, and no removal of the placenta by hand. Finally, they concluded that the Joel-Cohen method was faster than the Pfannenstiel method but was an independent risk factor for endometritis [21]. In a comparative study similar to ours, they concluded that the total duration of

surgery, the recovery time after surgery, the time required to get out of bed without walking assistance, the time required to hear intestinal sounds, and the expulsion of gas And stool and postoperative pain in patients undergoing Joel-Cohen surgery was less than that of Pfannenstiel, which is similar to the result of our study. While the rate of blood loss and reduction of hematocrit after surgery was similar in the two methods [22], which is contrary to the results of our study. Of course, the surgeon's skill may also affect the rate of blood loss. In another comparative study, it was found that the duration of surgery and removal of the fetus, as well as the duration of hospitalization after cesarean section in patients who underwent the Joel-Cohen method, were significantly shorter than women who underwent Pfannenstiel surgery. The need for analgesics in the Pfannenstiel method was more than in the Joel-Cohen method [19].

Franchi M, et al. [23] concluded that the duration of surgery was similar in the two methods and the rate of complications during and after surgery. Also, the type of

surgical procedure did not affect the assessment of neural development in neonates at 6 months of age. Mathai M, et al. [24] Concluded that the Joel-Cohen cesarean section compared to Pfannenstiel had advantages such as less fever, less pain, less analgesia, reduced blood loss, shorter surgery time, and shorter hospital admission, although these studies do not show long-term morbidity and mortality. In Ferrari AG, et al. [25], it was found that the duration of surgery and the number of sutures used in the Joel-Cohen method were shorter than in Pfannenstiel, and patients start moving and their intestinal function occurs earlier, while the incidence of fever after surgery was not different in the two groups. Esmer AC, et al. [26] concluded that subcutaneous suturing did not reduce wound complications such as opening in Pfannenstiel surgery. In this study, it was found that maternal diabetes and a thickness of more than 4 cm of subcutaneous tissue were risk factors for wound opening, but in multivariate analyzes, they lost this significant relationship. In a retrospective study, it was found that the use of the classical Joel-Cohen method is more rational than the modified Stark cesarean method and leads to a reduction in the amount of hematoma [27].

## Conclusion

According to the results, it seems that the Joel-Cohen cesarean section method has more advantages for mothers compared to Pfannenstiel.

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