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To Compare Scalpel Vs Electrocautery usage on Intra and Postoperative Outcomes in Primary Lower Segment Cesarean Section

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Abstract

Background: In an effort to improve patient outcomes, the surgical procedure for Caesarean sections, has undergone several modifications. Among these modifications was the introduction of Electrocautery for obstetric procedures.

Objective:

1. To assess and compare the Post-Operative Pain in patients undergoing primary caesarean section with Electrocautery and scalpel.
2. To evaluate and compare the other intra and post-operative outcomes in patients undergoing primary caesarean section with Electrocautery and scalpel.

Methods: It is a prospective study conducted at Sri Sidharatha Medical Collage, Tumkuru. A total of 70 patients who met inclusion criteria were underwent cesarean section. Group A(n=35), underwent cesarean section via scalpel incision and group B (n=35), underwent cesarean section via electrocautery. After Caesarean section, the outcome measures were the visual analogue scale (VAS) pain score, operative time, blood loss, and wound healing in both the groups.

Results: In our study, the mean operative time in Group A (Scalpel group) was 80.34 ±6.41 minutes while in Group B (Electrocautery group) was 60.17±5.33 minutes (p-value 0.0001). Mean blood loss in Group A(scalpel group) was 587.28 ± 87.34 ml while in Group B (Electrocautery group) was 294.42 ± 60.98ml(p-value = 0.0001). Mean post-operative pain in Group A (scalpel group) at 2hrs,4hrs,6hrs,8hrs,10hrs,12hrs and 24hrs as follows 6.51±1.31,2.80±0.99,3.82±1.63,5.54±1.54,6.11±1.81,5.48±2.02 and 6.34±1.32 while in Group B (Electrocautery group) was 3.88±1.45,4.05±1.32,2.37±1.63,4.74±1.54,4.85±1.81,4.40±1.98,5.20±1.38 (p-

value = 0.0001).There was no significance difference in wound healing in both the groups.

Conclusion: This study concluded that the Electrocautery incision is better than scalpel incisions in terms of incision time, blood loss and post-operative pain. However there was no significant difference in wound healing both the groups.

Keywords: caesarean section, Electrocautery, blood 1oss, VAS pain score

Introduction

Cesarean delivery defines the birth of a fetus by laparotomy and then hysterotomy. There are many techniques of performing Caesarian section. Every technique has its own advantage and disadvantage. The skin incision may be vertical, midline, Para median and the most common being pfannensteil incision. Electrocautery is an alternate method to open the skin by the use of an alternating current. Electrocautery is time saving method with rapid haemostasis, rapid and precise tissue dissection and a reduced overall operative blood loss. Skin incisions are routinely made with stainless steel scalpel which are supposed to be more bloody and painfull. The disadvantages of steel scalpel include more blood loss, indistinct tissue separation, more operative time. Post-CS pain comprises a set of pain pathways that originate mainly from somatic and visceral sources, but also from psychosocial factors. Somatic pain is characterised by localisation and fades within 2 - 3 days. Electrical and chemical activities in the nerves, stimulated by tissue damage, lead to pain perception. The manipulation of abdominal organs and the peritoneum during an operation, as well as the uterine involution process (after pain), stimulates visceral pain. Visceral pain is characterised as being diffuse and extended. Complete uterine involution is reached ~2 weeks after Cesarean section. Another important factor is psychosocial pain, which can aggravate pain perception and may stimulate the chemical neurotransmitters of pain[1].

Material and Methods

The study was carried out as a prospective study, Study participants was randomly allocated to group A (women who received conventional scalpel incision) and group B (women who received cutting diathermy incision) after satisfying inclusion and exclusion criteria. An informed consent was obtained from all the participants enrolled in the study. After enrollment, detailed history (including menstrual history, Obstetric history, past and family history) and general physical examination and systemic examination was done. During Caesarean section, In the scalpel group, the incision was made by the traditional method, with proper haemostasis, by applying pressure to cutaneous blood vessels and ligating the subcutaneous vessels. In the Diathermy group, the incision was made using a small flat blade pen electrode, set on cutting mode and delivering a 120 watt (maximum) sinusoidal current, with electrosurgical cutting performed without pressure or mechanical displacement. We compared operative time using a digital clock. The operative time was established as follows: when a skin incision will be made, the surgeon called out, ‘start the clock’. Once the skin was closed, the surgeon called out, ‘stop the clock’. The operative time was the difference between start and stop. We also compared the incision blood loss. This was calculated by pre- and postoperative weighing of the swabs (1 mg= 1 mL) after complete haemostasis had been achieved. We compared the postoperative pain for 24 hours by VAS score, a psychometric response scale. It is an instrument used to measure subjective characteristics or attitudes that cannot be measured

directly. The scale ranges from 0(one pain extreme, e.g. no pain) to 10 (the other pain extreme, e.g. pain as bad as can be imagined or worst pain imaginable). This score was recorded for each participant at 2,4, 6, 8, 10, 12 and 24 hours postoperatively. Lastly, we compared both groups with regard to wound healing and complications, such as seroma, haematoma, ecchymosis, dehiscence (separation of the subcutaneous tissues and skin) and infection. After Caesarean section, the outcome measures were analysed using appropriate statistical methods with regard to the visual analogue scale (VAS) pain score, operative time, blood loss, and wound healing in both the groups.

Objective

1. To assess and compare the Post-Operative Pain in patients undergoing primary caesarean section with Electrocautery and scalpel.

2. To evaluate and compare the other intra and post-operative outcomes in patients undergoing primary caesarean section with Electrocautery and scalpel.

Inclusion Criteria's

1) Patients of age 18-40years

2) Gestational age 37-41 weeks

3) BMI<30 Kg/m^2

4) Primary caesarean section

5) Singleton Pregnancy

Exclusion Criteria

1. Diabeties
2. Chronic Anemia
3. Chronic Skin condition
4. Previous LSCS
5. Multiple gestation
6. Cardiac patients with pacemaker
7. Patient on anticoagulant
8. Patients who are lost to follow up

Result

Table 1: Comparison of Age between The Groups

Age	Group-A		Group-B	
	Number	Percentage (%)	Number	Percentage (%)
20-30	32	91.43	27	77.14
31-40	3	8.57	8	22.86

The demographic data reveals that in group A, 32 pregnant women were in the age group of 20yrs-30yrs(91.43%), remaining 3 were in age group of 31yrs-40yrs with a mean age group of 26.42±3.51 and in group B,27 women were in the age group of 20-30yrs(77.14%) and remaining 8 women were in the age group of 31-40yrs with mean age group of 27.91±3.99.This comparable distribution ensures minimal age-related bias in evaluating the study outcomes.

Table 2: Comparison of Mean Operative Time (Min) Between The Groups

Groups	Operative time (min) (MEAN±SD)	p value
Group-A	80.34±6.41	0.0001
Group-B	60.17±5.33	

In this study, the mean operative time in Group A (Scalpel group) was 80.34±6.41minutes while in Group B (Electrocautery group) was 60.17±5.33 minutes which showed operative time was less with group B (Electrocautery) when compared to group A (scalpel group).It is statistically significant (P<0.05).This suggests that Electrocautery is more time efficient compared to the scalpel group.

Table 3: Comparison of Mean Blood Loss between the Groups

Groups	Blood loss (MEAN±SD)	p value
Group-A	587.28±87.34	0.0001
Group-B	294.42±60.98	

In this study, the mean blood loss in Group A (Scalpel group) was 587.28±87.34ml while in Group B (Electrocautery group) was 294.42±60.98 ml which showed blood loss was less with group B (Electrocautery) when compared to group A (scalpel group) which is statistically significant (P<0.05). Electrocautery appears to offer better hemostatic control, reducing intraoperative bleeding significantly.

Table 4: Comparison of Post-Operative Pain Between The Groups At Different Time Periods

Time (hr)	Group-A (MEAN±SD)	Group-B (MEAN±SD)	p value
2	6.51±1.31	3.88±1.45	0.0001
4	2.80±0.99	4.05±1.32	0.0001
6	3.82±1.63	2.37±1.63	0.0001
8	5.54±1.54	4.74±1.54	0.0001
10	6.11±1.81	4.85±1.81	0.0001
12	5.48±2.02	4.40±1.98	0.0001
24	6.34±1.32	5.20±1.38	0.0001

In this study, Mean post-operative pain in Group A (scalpel group) at 2hrs,4hrs,6hrs,8hrs,10hrs,12hrs and 24hrs as follows 6.51±1.31,2.80±0.99,3.82±1.63,5.54±1.54,6.11±1.81,5.48±2.02 and 6.34±1.32 while in Group B (Electrocautery group) was 3.88±1.45,4.05±1.32,2.37±1.63,4.74±1.54,4.85±1.81,4.40±1.98,5.20±1.38which is statistically significant (p-value = 0.0001) which showed pain was less in electrocautery group when compared to scalpel group. This indicates that electrocautery causes injury to nerve endings, contributing to better postoperative comfort.

Table 5: Distribution of Subjects Based On Wound Healing

Wound healing	Group-A		Group-B	
	Number	Percentage (%)	Number	Percentage (%)
Hematoma	1	2.86	0	0.00

SSI	2	5.71	1	2.86
No	32	91.43	34	97.14

In this study, in Group A (Scalpel group) showed 2 SSIs and 1 wound hematoma while in Group B (Electrocautery group) only 1 case of SSI was seen which did not show much difference in wound healing between the 2 groups.

Discussion

In our study, the mean operative time in Group A (Scalpel group) was 80.34±6.41 minutes while in Group B (Electrocautery group) was 60.17±5.33 minutes which showed operative time was less with group B (Electrocautery group) when compared to group A (scalpel group). It is statistically significant (P<0.05).Similar results were seen in other studies also. In a study done by A A-Mageed et all[1] (2022), Incision time in group 1 (Scalpel group) is 67.43 min and in group 2 (Diathermy) it is 46.78 min. In shafaq mohmood et all[2](2021), mean operative time in Group A (Electrocautery group) was 66.92 ± 7.39 minutes while in Group B (scalpel group) was 86.98 ± 5.84 minutes (p-value = 0.0001).

The mean blood loss in Group A (Scalpel group) was 587.28±87.34ml while in Group B (Electrocautery group) was 294.42±60.98 ml which showed blood loss was less with group B (Electrocautery group) when compared to group A (scalpel group) which is statistically significant (P<0.05). This results were comparable to other studies. In a study done by A A-Mageed et all[1](2022) Mean blood loss in Group 1 (scalpel group) was 6-28 ml while in Group 2 (Electrocautery group) was 2-15 ml. In shafaq mohmood et al[2](2021) Mean blood loss in Group A (Electrocautery group) was 194.32 ± 56.01 ml while in Group B (scalpel group) was 418.96 ± 26.18 ml. In a study done by Eser Ağar [3] the mean blood loss in group 1(scalpel group) was 19g and in group2(Electrocautery group) it is 11g. In this study, Mean post-operative pain in Group A (scalpel group) at 2hrs,4hrs,6hrs,8hrs,10hrs,12hrs and 24hrs as follows 6.51±1.31,2.80±0.99,3.82±1.63, 5.54±1.54,6.11±1.81,5.48±2.02 and 6.34±1.32 while in Group B (Electrocautery group) was 3.88±1.45, 4.05±1.32,2.37±1.63,4.74±1.54,4.85±1.81,4.40±1.98,5.20±1.38which is statistically significant (p-value = 0.0001) which showed pain was less in Electrocautery group when compared to scalpel group, similar results were seen in other studies also. A A-Mageed et all[1](2022)done a study which showed Mean post-operative pain in Group 1 (scalpel group) was 10 +8 while in Group 2 (Electrocautery group) was 6± 4 (p-value = <0.001) and in shafaq mohmood et al[2](2021) Mean post-operative pain in Group A (Electrocautery group) was 1.84 ± 1.13 while in Group B (scalpel group) was 3.28 ± 1.37. Ammar Ismail et al[4] (2017) showed lower pain score in electrocautery group lower pain scores (SMD =-0.91, 95% CI[-1.27 to -0.55]) . In this study, in Group A (Scalpel group) showed 2 SSIs and 1 wound hematoma while in Group B (Electrocautery group) only 1 case of SSI was seen which did not show much difference in wound healing between the 2 groups. This study showed similar results done by Ammar Ismail et al[4] (2017) study showed no significant differences in terms of wound infection rates (OR = 0.92, 95% CI [0.74-1.15]) or overall subjective scar score (SMD=-0.49, 95% CI [-1.72 to 0.75]). Esra ISCI BOSTANCI[5](2020) observed wound infection in 3 cases (9.6%) in electrocautery group and 6 cases(16%) in scalpel group which did not show any significance.

Conclusion

This research determined that diathermy incisions are superior to scalpel incisions with regard to incision time, blood loss, and post-operative pain. Therefore, we suggest that Electrocautery can be utilized regularly in cesarean sections to minimize blood loss, operative time and post-operative pain, which will ultimately enhance their quality of life by decreasing post-operative morbidity. However there was no significant difference in SSI between the 2 groups.

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