

ORIGINAL ARTICLE

Comparison of the Frequency of Wound Infection between Subcuticular Stitches Versus Interrupted Mattress Sutures after Cesarean Section

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ABSTRACT

Objectives: To compare the frequency of wound infection between subcuticular stitches versus interrupted mattress sutures after cesarean section.

Setting: Obstetrics & Gynecology Department, Bahawal Victoria Hospital, Bahawalpur.

Study duration: 21st July 2019 to 20th December 2020

Study design: Randomized controlled Clinical trial

Materials & Methods: In this clinical trial study, A sum-total of 60 women, 18-40 yrs of age, scheduled for planned elective cesarean section through Pfannenstiel incision were enrolled. In Group I women, subcuticular sutures were placed while in group II women, interrupted mattress sutures were placed. All women were discharged on tablet Augmentin 1gram x twice a day for 7 days at which wound infection was noted.

Results: The mean age of women in group I was 27.60 ± 5.16 years and was 27.40 ± 3.99 years in group II. My study has shown the wound infection in group I (sub-cuticular stitches) as 01 (3.33%) and in group II (interrupted mattress sutures) as 08 (26.67%) respectively with p-value of 0.011.

Conclusion: The inference from my study shows that the wound infection after cesarean section is less after sub cuticular stitches as compared to interrupted mattress sutures.

Keywords: cesarean section, sub cuticular stitches, wound infectio

INTRODUCTION

Amongst all the procedures performed on women all over the world, Caesarean section is one of the most prevalently done operations. Over the last two decades, the graph of the rate of caesarean section deliveries has ascended swiftly from 12% in 1990 to 24% in 2008 owing to many factors and influences, without significantly improving perinatal morbidity and mortality¹. Pfannenstiel incision is the most frequent incision of choice in Caesarean section. It was first described in 1971 by Hermann Pfannenstiel.² It is a low transverse supra-pubic incision given 2 fingers above the pubic bone. It not only offers adequate exposure of pelvic viscera but also provides better cosmesis, less pain, short healing time and less blood loss.^{3,4}

The type of closure is very important in both elective and emergency patients especially those who have risk factors like anemia, malnourishment, chronic illnesses and repeated surgeries etc. Disregarding the risk factors during the choice of wound closure technique can result in infection, wound disfigurement and complications.⁵ Opting the finest repair plays a consequential part in keloid emergence, hyperpigmentation, and development of a hypertrophic scar. The depth and extent of the incision along with sepsis and local irritation could affect the scar and scab formation.⁵ Wound dehiscence is pivoted on a bundle of factors pertaining to patient herself besides suture and closure fashion.² A sharp clean incision with gentle tissue handling minimizes tissue damage. A 4:1 ratio of needle bites to suture running in the skin has been emphasized upon to improve healing.³ Surgeons are more

inclined towards mass closure of abdominal wall than layered closure.⁴ Non-absorbable sutures (e.g., polypropylene) have been experienced to increase post operative pain and sinus formation thus does not show a major decrease in the incidence of burst abdomen, gut herniation, dehiscence, or sepsis when compared with absorbable monofilament sutures, like polydioxanone.^{5,6}

The closure skills of the surgeon should be brisk, simple, cost effective for favourable outcomes. The ultimate goal is beautiful skin approximation with quick healing in minimum time with little or no complications like pain, redness, disfigurement and keloid formation.⁶ Interrupted mattress sutures, staples, adhesive strips and subcuticular sewing with absorbable or non-degradable materials are in practice to close incisions.^{7,8} A study reports 5.69% rate of wound infection in the sub-cuticular stitches as compared to 38.46% in the interrupted mattress sutures ($p < 0.05$).⁹

Sub-cuticular skin stitches should be taken into consideration in modern Obstetrics because of the favorable outcomes. Owing to the limited available data, further studies are needed. We therefore decided to conduct this study to compare the frequency of wound infection between subcuticular stitches versus interrupted mattress sutures after cesarean section. This study will be a very useful addition in the existing literature and will also provide information about local statistics of our community and local practices. Then based on the results, the better method of the two can be opted and become a part of our local SOPs regarding wound closure. This will definitely lower down the graph of inappropriate and prolonged use of antibiotics and decrease the patient's morbidity.

MATERIALS AND METHODS

Study Design: Randomized controlled clinical trial.
Place and Duration of Study: 21st July 2019 to 20th December 2020.

Sample Size: A sum-total of Sample size calculated was 60 i.e. 30 in each group by taking 5% level of significance, 80% power of study and taking percentage of wound infection as 5.69% in the sub-cuticular stitches and as 38.46% in the interrupted mattress sutures.⁹

Sample Technique: Non-probability, consecutive sampling.

Sample Selection: All women between 18-40 years and parity 0-5, undergoing elective cesarean section through Pfannenstiel incision with Singleton pregnancy of cephalic presentation at period of gestation ≥37 weeks as assessed on LMP were included in the study. Patients with twin pregnancy, urinary bladder or gut injury during cesarean section, with any chronic disease like CLD, CRF, DM, Anemia and chronic steroid users were excluded.

Data Collection Procedure: Total number of 60 females admitted to Obstetrics & Gynecology ward, BVH Hospital, Bahawalpur, fulfilling the Inclusion criteria were selected. After taking informed verbal consent, all women were randomized into two groups i.e. I & II by lottery method. All women were asked to choose a slip from a bowl of total mixed up slips (half-slips were marked with letter 'I' and other half-slips with letter 'II') and then she was nominated in the group she chose from the slip herself. In both groups Surgery was done by one consultant gynecologist (at least 3 years of post-fellowship experience). In Group I women, subcuticular stitches were placed while in group II women, interrupted mattress sutures were placed. All women in both groups were given single dose of inj ceftriaxone 1gm pre-operatively and twice daily for 2 days. All women were discharged on tablet Augmentin 1gm x BD for 7 days at which wound infection was noted. Any discharge from the wound or collection of pus in the wound as assessed on clinical examination was taken as positive by the researcher herself.

Data analysis procedure: Statistical analysis was performed using SPSS version 20. Mean and standard deviation were calculated for age, gestational age, operation time, parity and BMI. Frequency and percentage were calculated for previous cesarean section (yes/no) and wound infection (yes/no). The wound infection was compared by chi square test between both groups and p-value ≤0.05 was considered as significant.

RESULTS

The age of the participants in this study ranged from 18 to 40 years with their mean ages in years between 27.53 ± 4.31. The mean age in group I was 27.60 ± 5.16 years and in group II was 27.40 ± 3.99 years. Most of the participants enrolled in the study 37 (61.67%) were between the ages of 18 to 30 years as shown in Table I.

Period of gestation was from 37-41 weeks with mean gestational age of 38.35 ± 1.32 weeks. The mean gestational age in group I was 38.33 ± 1.30 weeks and in group II was 38.60 ± 1.35 weeks as shown in Table I. Mean parity was 3.29 ± 1.17 (Table I). Mean operative time was 22.52 ± 7.55 minutes (Table II). Mean BMI was 28.88 ± 3.17 kg/m² (Table I). Distribution of patients according to

previous CS and are also shown in Table I.

My study has shown the wound infection in group I (subcuticular stitches) as 01 (3.33%) and in group II (interrupted mattress sutures) as 08 (26.67%) respectively with p-value of 0.011 as depicted in Table III.

Table 1: Demographic Characteristics

Demographics		Group I (n=30)	Group II (n=30)	Total (n=60)
AGE(years)	18-30	20 (66.67%)	17 (56.67%)	37 (61.67%)
	31-40	10(33.33%)	13 (43.33%)	23(38.33%)
	Mean ± SD	27.60 ± 5.16	27.40 ± 3.99	27.53 ± 4.31
Gestational Age(weeks)	37-39	22(73.33%)	20(66.67%)	42(70.0%)
	40-41	08(29.67%)	10(33.33%)	18(30.0%)
	Mean ± SD	38.33 ± 1.30	38.60 ± 1.35	38.35 ± 1.32
Parity	0-3	22(73.33%)	17(56.67%)	39(65.0%)
	4-5	08(26.67%)	13(43.33%)	21(35.0%)
	Mean ± SD	3.37 ± 1.16	2.83 ± 1.18	3.29 ± 1.17
BMI (kg/m ²)	≤27	13(43.33%)	12(40.0%)	25(41.67%)
	>27	17(56.67%)	18(60.0%)	35(58.33%)
	Mean ± SD	28.63 ± 3.21	29.13 ± 3.16	28.88 ± 3.17
Previous CS	Yes	8(26.67%)	10(33.33%)	18(30.0%)
	no	22(73.33%)	22(66.67%)	42(70.0%)

Table 2: Study Outcomes

		Group I (n=30)	Group II (n=30)	Total (n=60)
Operative Time (min)	≤25 min	17(56.67%)	16(53.33%)	33(55.0%)
	>25 min	13(43.33%)	14(46.67%)	27(45.0%)
	Mean ± SD	22.50 ± 8.10	22.53 ± 7.10	22.52 ± 7.55

Table 3: Comparison of wound infection between both Groups (n=60)

		Group I (n=30)		Group II (n=30)	
		No. of Patients	%age	No. of Patients	%age
Wound Infection	Yes	01	3.33	08	26.67
	No	29	96.67	22	73.33

P value is 0.011 which is statistically significant.

DISCUSSION

Since the advent of C section, various techniques, to close the Pfannenstiel skin incision of cesarean section have evolved over last few decades like; interrupted mattress sutures, subcuticular stitches, adhesive tapes and staplers. Every technique adopted has its own set of merits and demerits. The subcuticular technique is simply running a stitch through the subcuticular space or epidermal tissue. It is a facile and safe method of approximation. Interrupted vertical mattress stitch means entering the skin at four separate points at the same proportion for a single stitch taking a comprehensible part of subcutaneous tissue and fascia. This type of closure allows blood and serosanguinous tissues to drain. However, this technique is time consuming.¹⁰

The supremacy of subcuticular skin stitches following cesarean section over vertical mattress sutures are less complications (sepsis, hematoma and gaping) and rapid healing with cosmetically better appearance. This technique results in better skin edges approximation that minimizes bleeding and risk of infection.

We have carried out this study to compare the frequency of wound infection between subcuticular stitches

versus interrupted mattress sutures after cesarean section. Our study has shown the wound infection in group A (subcuticular stitches) as 01 (3.33%) and in group B (interrupted mattress sutures) as 08 (26.67%) respectively with p-value of 0.011. In a study, the rate of wound infection was 5.69% in the subcuticular stitches as compared to 38.46% in the interrupted mattress sutures ($p < 0.05$).⁹

A Cochrane systematic review on the use of closure material in caesarean section revealed that staples increase the risk of separation and wound re-suturing than absorbable subcuticular sutures.¹¹ Brown JK, et al. in another Randomized clinical trial compared subcuticular absorbable suturing to skin adhesives and predicted no significant difference in cosmetic outcome in both types of manner, yet Skin adhesives were of high-cost but were quick and done in a nible of time.¹²

Guruswami, et al. in a Cochrane database systematic review studied the difference between continuous vs. interrupted mattress for non- obstetric surgeries and reviewed that adopting subcutaneous stitches may help in minimizing the flimsy adhesions.¹³ A meta-analysis review of 10 randomized controlled trials in contrast reflected that both absorbable and non absorbable sutures are comparable to each other in terms of surgical outcomes like surgical site sepsis and other morbid outcomes. In addition absorbable sutures in actual cutback the threat of skin wound dehiscence when compared to non-absorbable suture.¹⁴

Tanaka A et al published a study to reveal that subcuticular stitching did not escalate the wound complications in the post operative recovery of colon cancer patients.¹⁵ The end-users were more likely to opt for subcuticular suturing owing to its esthetical and cosmetic appearance with an addition of more comfort and less pain. Similar results and patient preferences were reported by Javadi S et al, while discussing skin closure after appendectomy procedures.¹⁶

A meta-analysis of research studies comparing subcuticular suture to staple was analysed in cesarean sections and revealed that, staple closure is swift but may uplift wound complications.¹⁷ In a sister study Clay et al scrutinized randomized control trials for evaluating various sewing manners in c sections and verdicted that subcuticular stitch was favourable to staples in terms of post-operative wound healing an observation similar to our findings.¹⁸ Another Cochrane review of research material available emphasized upon the similar findings while insisting about the favorable choice of suture material for closing of incision in obstetric procedures.¹⁹

Hence following inference can be summed up from the discussion above that sub-cuticular suturing skill is not only cost effective but also rescues operating time when compared with interrupted mattress stitches.

JD Kolt used the combination of adhesive surgical tape and the absorbable continuous subcuticular suture in his clinical trial and results reflected that this fusion of 2 ways use of allows perfect and neat skin approximation, with enhanced safety margins. This union closure has a upper edge in cosmetic result than with sole tape or subcuticular stitch alone.²⁰

CONCLUSION

This study concluded that the wound infection after cesarean section is less after subcuticular stitches as compared to interrupted mattress sutures. So we recommend that subcuticular stitches should be used routinely in caesarean section in order to decrease the rate of wound infection as well as morbidity of these particular patients.

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