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WOUND COMPLICATIONS;

COMPARISON OF NON-ABSORBABLE SUTURE (PROLENE) WITH ABSORBABLE SUTURE (VICRYL) IN TERMS OF WOUND COMPLICATIONS AND COSMESIS.

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ABSTRACT: Cesarean section is the most commonly performed abdominal operations on women worldwide. Its rate has increased markedly in recent years in most developed countries. Due to insufficient available data regarding the best suture materials for cesarean skin closure, we conducted a study "to compare the efficacy of 2 suture materials non absorbable prolene 2-0 and absorbable suture vicryl (2-0), brand Ethicon as subcuticular skin stitches in women undergoing elective cesarean section. **Study Design:** Prospective, observational study. **Setting:** Department of Obstetrics and Gynecology, Bahawal Victoria Hospital Bahawalpur. **Period:** 6 months. **Materials and Methods:** A total of 200 women fulfilling inclusion and exclusion criteria as above were enrolled for the present study. They were divided into 2 groups of 100 each by systematic sampling technique. **Results:** There is statistically significant difference related to post-operative wound complication parameters between non absorbable vs absorbable suture material on day 8, 15, 30 and 45. More number of patients having absorbable suture had pain, tenderness swelling and indurations. Maximum number of participants, that is, 86 (86%) and 93 (93%) from Group 1 showed excellent wound healing at day 30 and day 45 of caesarean section as compared to 63 (63%) and 66 (68%) from Group 2. **Conclusion:** The non-absorbable suture (prolene) was better in terms of wound healing and cosmesis as compared to absorbable suture used in our study (vicryl).

Key words: Cosmesis, Prolene, Vicryl, Wound Complications, Wound Dehiscence.

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INTRODUCTION

Cesarean section is the most commonly performed abdominal operations on women worldwide. Its rate has increased tremendously over years accounting for upto 20-25% of all childbirths in most developed countries.[1] Following cesarean a serious complication is wound infection implicating a big financial burden.[2,3] Skin is closed by approximating the skin edges using different suture materials. The oldest known materials that have been used as suturing matereal are linen, human hair, cotton, and flax and dates back to 1100 BC, and remain unchanged till the 1800's. First innovation that was introduced on the subject was in 1901. Sutures were made from catgut, kangaroo gut (kept in glass tubes), gold and silver wires in addition to the already existing natural materials.[4] In today's era certain modern suture materials and techniques have been adopted including Staples, adhesives, tape, and sutures for skin closure in cesarean section.[5] However, there is no enough evidence to recommend one method that is superior to the other. The suture material mostly used in cesarean skin closure is subject to surgeons preference, experience and availability of suture material. regarding closure technique the Subcuticular stitches are associated with better wound healing and cosmesis.[6] While selecting the suture material we opt a material and method that is easy, cost-effective, rapid yet having better cosmetic results. The main aim of wound treatment and skin closure specifically is rapid closure with a functionally and esthetically good scar.[7] insufficient available data regarding the best suture materials for cesarean skin closure, calls for further research on the subject and thus we conducted a study "to compare the

efficacy of 2 suture materials non absorbable prolene 2-0 and absorbable suture vicryl, brand Ethicon as subcuticular skin stitches in women undergoing elective cesarean section."

Aims and Objectives

To compare the efficacy of 2 suture materials non absorbable prolene 2-0 and absorbable suture vicryl, brand Ethicon as subcuticular skin stitches in women who had elective cesarean section to search the suture material which is cost-effective, with least complications and gives good cosmesis.

MATERIALS AND METHODS

This was a prospective, observational study conducted in the Department of Obstetrics and Gynecology, Bahawal Victoria Hospital Bahawalpur for 6 months after approval from the Institutional Ethical Committee.

Inclusion Criteria

1. Participants undergoing elective cesarean section for the first time.
2. Hemoglobin more than 10 g %.

Exclusion Criteria

Were previous abdominal surgeries including obesity BMI > 35, medical illness - pulmonary Koch's, bronchial asthma, diabetes, hematological disorders, skin infections, and emergency obstetrics indications.

METHODS

A total of 200 women fulfilling inclusion and exclusion criteria as above were enrolled for the present study. They were divided into 2 groups of 100 each by systematic sampling technique.

- In Group 1: Non absorbable prolene 2-0 were used as subcuticular stitch for skin closure.
- In Group 2: Absorbable suture vicryl (2-0), brand Ethicon in wound healing was used.

Elective cesarean section was performed for different indications by giving pfannenstiel incision. the same operative technique was adopted for all patients, performed by consultants or residents with minimum 2 years training experience and suture material was used in accordance with systemic sampling technique for respective groups (i.e., Group 1 non absorbable prolene 2-0. Group 2, absorbable suture vicryl (2-0), brand Ethicon). Anesthesia used was spinal anesthesia in all surgeries. All patients were adaily assessed after surgery till discharged from the hospital. Wound evaluation as per standard was done at 3, 8, 15, 30 and 45 days post operative. Primary outcome was pain, disruption of scar or wound infection within 4-6 weeks, secondary outcome was cosmetic score. Dressing was changed on 3rd post operative day before the discharge from the hospital. In group 1(non absorbable suture group) patients had removal of stitches on 8-12 post op day. A standardized physical examination of the wound was performed by resident/ consultant on every visit in both groups. Pain and tenderness were assessed on the basis of visual analog scale. 0 – no pain, 10 is severe pain with grading of mild, moderate, and severe. Swelling and indurations noted in form of erythema, edema, and localized tissue hardening; discharge from the wound described in terms of serous, serosanguinous, or purulent; wound dehiscence described as superficial or deep; and wound healing and cosmesis by the Modified Hollender Cosmesis Scale, comprising six components:

1. Step-off borders (0 for yes, 1 for no).
2. Contour irregularity - puckering.
3. Scar width - <2 mm.
4. Edge inversion - sinking, curling.
5. Inflammation - redness, discharge.
6. Overall cosmesis

(0 = poor, 1 = acceptable).

The wound score addresses 6 clinical variables: Absence of step-off, contour irregularities, wound margin separation >2 mm, edge inversion, excessive distortion, and overall cosmetic appearance. Each of these categories is graded on a 0-or 1-point scale. A total cosmetic score is made by adding up all points of the 6 categorical variables. A score of 6 is considered satisfactory, while a score of <5 unsatisfactory.

Data were analyzed for categorical and continuous variables such as age, properties of suture materials, and post-operative wound

complications for type of suture materials used for subcuticular skin incision closure. (p value of 0.001 is considered significant).

RESULTS

Table-I lists the demographic and the clinical characteristics of participants. There was no difference in clinical characteristics between the study groups.

From Table-II and III, it is obvious that there is statistically insignificant difference in terms of pain and tenderness on day 3, post op in both groups. Whereas there was significant difference in swelling and discharge from wound on day 3. both were observed in more patients with absorbable suture. There was no scar dehiscence in both groups on day 3. Pain, tenderness, swelling and discharge were significantly more in absorbable group on day 8 and 15.

From the Table-IV, it is clear that the number of participants with severe pain was maximum in absorbable suture Group 2, that is, 26.0% on day 3, 14% on day 8, and 10% on day 15. On day 30, 2 (01%) participant had moderate and 0 (0%) had mild pain in Group 2, whereas there were only 2% patients with mild pain in non absorbable suture group Group 1. On day 45, 1 (01%) patient had mild pain in Group 2, whereas there was no complain of pain in Group 1.

The wound healing and cosmesis were assessed on day 30 and day 45 by Modified Hollander's Scale where wound evaluation score (WES) of 6/6 was graded as "excellent." Maximum number of participants, that is, 86 (86%) and 93 (93%) from Group 1 showed excellent wound healing at day 30 and day 45 of caesarean section as compared to 63 (63%) and 66 (68%) from Group 2.

Parameters	Group 1	Group 2
Age	25 (19 - 31)	24 (18 - 32)
Gestational Age	39 (37 -42)	39(37 - 40)
Weight (Kg)	71.3 (64- 94)	72.7 (69-90)
No. of Vaginal Examination	1(1 - 3)	1 (1 - 3)

Table-I. Age and clinical parameters.

Post op wound Complications	DAY 3 Group 1 n=100 Non Absorbable Suture	DAY8 Group 1 n=100 Non Absorbable Suture	DAY 3 Group 2 n=100 Absorbable Suture	DAY 8 Group 2 n=100 Non Absorbable Suture	DAY 3 P-Value	DAY 8 P-Value
Pain	38 (38%)	23(23%)	42 (42%)	35(35%)	0.01 Not Significant	0.001 Significant
Tenderness	40 (40%)	24(24%)	44 (44%)	32(32%)	0.01 Not Significant	0.001 Significant
Swelling	12 (12%)	11(11%)	30(30%)	25(25%)	0.001 Significant	0.001 Significant
Discharge	0 (0%)	2(2%)	6(6%)	22(22%)	0.001 Significant	0.001 Significant
Induration	10(10%)	10(10%)	30(30%)	15(15%)	0.001 Significant	0.001 Significant
Dehiscence	0(0%)	1(1%)	0(0%)	2(2%)	0.01 Not Significant	0.498 Not Significant

Table-II. Comparison of post operative wound complications parameters on day 3 and 8 between suture materials;

Post op wound Complications	DAY 15 Group 1 n=100 Non Absorbable Suture	DAY 30 Group 1 n=100 Non Absorbable Suture	DAY 15 Group 2 n=100 Absorbable Suture	DAY 30 Group 2 n=100 Non Absorbable Suture
Pain	18(18%)	2(2%)	27(27%)	2(2%)
Tenderness	9(9%)	1(1%)	20(20%)	3(3%)
Swelling	9(9%)	0(0%)	18(18%)	2(2%)
Discharge	4(4%)	11(%)	23(23%)	3(3%)
Induration	7(7%)	0(0%)	20(20%)	2(2%)
dehiscence	0(0%)	0(0%)	0(0%)	1(1%)

Table-III. Comparison of post operative wound complications parameters on day 15 and 30 between suture materials between both groups;

Post operative Day	Severity of Pain by VAS	Suture material Non absorbable n=100(%)	Absorbable n=100(%)	Total N=200 (%)
Day 3	Mild	12(12%)	6(6%)	18(9%)
	Moderate	13(13%)	10(10%)	23(11.5%)
	Severe	13(13%)	26(26%)	39(19.5%)
Day 8	Mild	12(12%)	14(14%)	26(13%)
	Moderate	10(10%)	7(7%)	17(8.5%)
	Severe	1(1%)	14(14%)	15(7.5%)
Day 15	Mild	13(13%)	7(7%)	20(10%)
	Moderate	3(3%)	10(10%)	13(6.5%)
	Severe	2(2%)	10(20%)	12(6%)
Day 30	Mild	2(2%)	0(0%)	2(1%)
	Moderate	0(0%)	2(2%)	2(1%)
Day 45	Mild	0(0%)	1(1%)	1(0.5%)

Table-IV. Distribution of participants according to severity of pain by VAS on post operative days 3,8,15 ,30 and 45.

Groups	Excellent wound healing with WES (6/6)	
	At 30 Days	At 45 Days
Group 1 Non Abdorbable Suture	86 (86%)	93(93%)
Group 2 Absorbable	68(68%)	76(76%)

Table-V. Comparison of wound healing and cosmesis between two suture materials

DISCUSSION

PAIN

In our study, pain and tenderness were significantly less with the non absorbable (prolene) suture as compare to the absorbable (vicryl polyglactin 910) suture. It was also noted in a study by Regan and Lawrence.[8] at the Center of Dermatologic Surgery at Cooper University Hospital. This study was conducted on 140 patients to compare polyglactin 910 in coetaneous surgery and it was found that polyglactin 910 was more painful.[8] Similarly, Vats and Pandit Suchitra.[9] conducted a randomized clinical trial on 90 patients at LTMMC, Sion Mumbai, to compare the suture materials in cesarean section and showed that polyglactin was associated with more pain and tenderness.

Swelling and Induration Our study showed that the number of participants with swelling and induration was significantly more in participants with polyglactin 910 as compared to prolene. Another study showed the number of participants with swelling and induration was significantly more in participants with polyglactin 910.[9,10] Patients were likely to develop more irritation at scar site followed by absorbable suture owing to late absorption of vicryl resulting in inflammation and itching. Similar findings were observed in study conducted by Tan et al[11] comparing the suture materials and concluded, long term itching was seen more frequently in absorbable

suture material group due to late absorption of such sutures. Peng Chiong Tan at al[12] conducted a study and concluded a similar result showing wound itch persisting at 4 weeks post operative in patients having absorbable suture for skin closure.

Discharge

Our study showed that the number of participants with discharge was significantly more with polyglactin 910 as compared to prolene. Similar findings were noted in a study by Regan and Lawrence,[8] which demonstrated that polyglactin resulted in more extruded suture and was more inflammatory and was associated with significantly more discharge.

Wound Dehiscence

Wound dehiscence being a multifactorial problem, dependent on many pre, per and post op factors, either local or systemic that increase the impeding forces among the stitch line that exceed the strength of holding suture material.

In our study, wound dehiscence was found more in polyglactin 910 group as compared to the prolene group. It is in compliance with the study by Vats and Pandit Suchitra,[9] which showed that wound dehiscence and requirement of resuturing are significantly higher with the polyglactin suture. In a similar study by Sharad Pandy at al[13] wound dehiscence was significantly higher in the vicryl group than the Prolene group. And Prolene was concluded to be better and more economical suture material for closure of abdominal scar.[13] Polyglacton 910 quickly loses its strength and takes 42 days to get absorbed and thus cause prolonged inflammation at scar site.[14]

Cosmesis

Table-V shows the comparison of excellent wound healing between suture materials assessed on the day 30 and 45. Prolene was associated with excellent wound healing more than the absorbable vicryl on day 30 and 45. Vats and Pandit Suchitra.[9] showed that wound healing is excellent with poliglecaprone and polypropylene in comparison with vicryl. It was further supported by another study showing the cosmetic results tend to be better in nonabsorbable group in primary surgery patients.[15]

CONCLUSION

We concluded that the non-absorbable suture (prolene) was better in terms of wound healing and cosmesis as compared to absorbable suture (vicryl). The cost of both sutures was comparable to each other. Therefore we concluded that non absorbable suture (prolene) should be used as it decreases the wound related complications and a better cosmesis complementing it further.

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