Effect on Post-Operative Pain of Suture Material used for Closure of Parietal Peritoneum in Caesarean Section

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ABSTRACT

Introduction: Caesarean section is the commonest obstetric surgery and postoperative pain is one of the major discomfort which drives post caesarean mothers to seek help. The study was undertaken to study the effect of closure of parietal peritoneum by Chromic Catgut versus Polyglactin on postoperative pain.

Material and Methods: It was a hospital based interventional study done in a tertiary care hospital over one year. Detailed history, investigations, operative details, postoperative outcome in terms of pain were noted. Unpaired t test and Pearson correlation coefficient were used for statistical analysis.

Result: Significantly less pain score was observed when Chromic Catgut was used. This difference was highly significant statistically at 16 hour (P=0.00005), 24hour (P=0.00001) and 40 hour (P=0.000104) postoperatively.

Conclusion: Peritoneal closure with Chromic Catgut suture is a better technique than closure in terms of less postoperative pain and cost saving.

Keywords: Caesarean, Chromic Catgut, Closure, Peritoneum, Polyglactin, VAS Score

INTRODUCTION

Caesarean section is the commonest and most significant operative procedure in obstetrics. The global increase in rate has been due to increase in high risk factors- pregnancy induced hypertension, diabetes,HIV infections and acute herpes genitalis. Increased detection of fetal distress, fetal malpresentations and intrauterine growth restriction have contributed to the increase in the number of caesarean sections performed.[1]

Usually the two layers of peritoneum are sutured again in most abdominal surgeries.Cited advantages of peritoneal suturing are restoration of anatomy, establishment of barrier, reduction in wound dehiscence, reducing haemorrhage and minimization of adhesions.[2] Choudhary A et al found dense adhesions where parietal peritoneum was left unsutured during previous surgery, access to the peritoneal cavity difficult and time consuming. In contrast to this, where parietal peritoneum was sutured second surgery was easier, faster, cleaner with few and flimsy adhesions and recommended routine closure of parietal peritoneum to reduce adhesion related morbidity and difficult subsequent surgery.[3]

Postoperative pain is one of the major discomforts which drives the caesarean mothers to seek help. Excessive postoperative pain can cause stimulation of some responses which leads to increased secretions in the lungs,sluggish bowel movements. This causes increased use of pain suppressant medicines and greater stay in hospital.This also delays breast feeding.[4] The numbness around the incision and occasional aches and pains may last for several months. De Brito Concado T O et al investigated the influence of anaesthetic and surgical technique and postoperative analgesia on the onset of chronic pain after three months of caesarean section and concluded that higher pain scores in the postoperative period were associated with chronic pain development after three months of caesarean section. This interferes with mother infant interaction.[5]

A small change in surgical technique like change of suture material affects various factors including post-operative pain. Even in the National Institute of Clinical Excellence (NICE) guidelines (2011)[6], there is no consensus regarding type of suture material to be used to close the peritoneum.

Very few studies have been done in this part of the country on these issues, thus this study was performed to find the relation of type of suture material used for peritoneal closure with post-operative pain.

The purpose of the study was to observe the effect of closure of parietal peritoneum in caesarean section by Chromic Catgut and Polyglactin 910 on postoperative pain.

MATERIAL AND METHODS

This was a hospital based interventional longitudinal study conducted in a Tertiary Care Hospital from 1st February 2015 for a period of one year. Approval of the Institutional Review Board was taken prior to the study. 80% study power and alfa error of 0.05 were used to calculate the sample size, assuming standard deviation of 1.48 for pain in Visual Analogue Scale[7] (VAS) as obtained in the study of Deshpande Hemant et al.[8] To detect a minimum difference of one in VAS scale,20 patients were recruited in each group which also considered 10% drop outs.

Primigravida of 18-35 years aged with average Body Mass Index (BMI) and single live full term pregnancy, who had caesarean section using spinal anaesthesia, and gave consent to participate in the study were selected. Anaemic women or those who had undergone any abdominal surgeries in the past or who had infection, hypertension or any other medical disease or on drugs that cause sedation were excluded. Women who had any intraoperative complications or postpartum haemorrhage were also excluded from the study.

A written informed consent was taken from all women for the surgery and to participate in the study. Joel Cohen technique was used in both the groups to open the abdomen. Parietal

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Patient characteristics	Group A (Chromic Catgut) n =20	Group B (Polyglactin910) n =20	Statistical significance
Mean age (In years ±S.D.)	23.27±3.24	22.90±2.79	P=0.587 Not significant
Gestational age (In weeks ± S.D.)	38.82±1.62	38.24±2.080	P=0.542 Not significant
Body Mass Index (kg/m^2)	21.37± 1.34	21.56±1.544	P=0.558 Not significant

Table-1: Patient characteristics

Time since surgery (hours)	Mean VAS score of Group A n=20	Mean VAS score of Group B n=20	Statistical significance *P* value
8 hours	9.4±0.75	9.9±0.0.85	0.0567 (NS)
16hour	6.4±0.49	7.25±0.44	<0.001(HS)
24hour	5.05±0.89	7.50±0.51	<0.001(HS)
32 hour	4.45±0.50	4.80±0.41	0.0219(NS)
40 hour	2.6±0.50	3.25±0.44	<0.001(HS)
48 hour	2.0±1.0	2.45±0.60	0.0992(NS)

Table-2: Comparison of Mean Visual Analogue Scale Score in the Study Groups

Age (years)	Mean VAS score at 24hours postoperatively	
	Group A	Group B
	n=20	n=20
	Mean±SD	Mean±SD
18-22 yrs.	5.10±0.88	7.20±0.42
23-27 yrs.	5.00±0.93	7.86±0.38
>27 yrs.	5.00±1.41	7.67±0.58
R value	-0.077 (NS)	0.4193 (NS)

Table-3: Correlation of postoperative VAS score with age.

Body Mass Index (kg/m^2)	Mean VAS score at 24hours postoperatively	
	Group A	Group B
	n=40	N=40
	Mean±SD	Mean±SD
<22	5.27±0.90	7.56±0.512
>22	4.77±0.83	7.25±0.50
R Value	-0.300 (NS)	-0.296 (NS)

Table-4: Correlation of VAS score with BMI.

peritoneum was sutured with chromic catgut or polyglactin 910 according to the group allocated. Intraoperative parameters and postoperative pain score were noted. Pain was assessed using visual analogue scale.

STATISTICAL ANALYSIS

The observations were statistical analysed and significance was noted by using unpaired t test or the Chi square test. Significant *P* value was <0.05.

RESULTS

The study comprised of two groups of twenty women each. Women in group A had closure of parietal peritoneum with chromic catgut while in the group B,closure of parietal peritoneum was done with polyglactin 910.Both the groups were comparable regarding mean age,gestational age and Body Mass Index (B.M.I.) (Table 1).

The pain as measured by mean Visual Analogue Scale score at 24 hours postoperatively was less when closure of parietal peritoneum was done using chromic catgut than with polyglactin 910 and the mean Visual Analogue Scale difference between the two groups was highly significant (Table 2). Thus, the women in the chromic catgut were more comfortable and could breastfeed their infant and move about with less discomfort.

In our study, the mean VAS score was compared between different age groups. Pearson correlation coefficient was used. The mean VAS score at 24 hours was taken for correlation. There was no positive correlation of pain score with other factors like age (Table 3) and Body Mass Index (Table 4). This rules out the confounding effect these factors could have had on VAS pain scores.

DISCUSSION

In our study,the postoperative pain score was compared when two suture materials- Chromic Catgut and Polyglactin 910 were used for closing the parietal peritoneum in caesarean section. Significantly less pain score was observed when Chromic Catgut was used. This difference was highly significant statistically at 24hour. Peritoneum being very reactive responds against any foreign material and releases pain mediating substances, thus there is greater postoperative pain.[9] Polyglactin 910 is a delayed absorbable and synthetic suture material and may be inducing more amount of foreign body reaction, thus causing more pain, producing greater inflammatory reactions and adhesions.[10]

Deshpande H et al (2012)[8] also studied the effect of peritoneal closure with Chromic Catgut or by polyglycolic acid suture but unlike our study, they observed no difference on post-operative pain in caesarean section when varying suture material were used.

We observed that though mean VAS score was statistically significant in all the age groups between the two suture group, there was no significant change in the mean VAS score within different age groups. Thus, age had no correlation with the pain score.

The VAS score was also compared between two groups of BMI <22 and >22. Pearson correlation coefficient was used. The mean VAS score at 24 hours was taken for correlation. Thus, BMI had no effect on the mean VAS score.

The strength of our study lies in the fact that it is a single observer study,VAS score was closely noted and it is a statistically well validated study.

The study had a few limitations

1.Sample size of the study was small for the result to be significant enough to be applicable to the general population.

2.Sample population was not representative of the general population as only primigravida singleton pregnancies were included. All malpresentations except breech and complicated

pregnancies were excluded from the study. Women with higher education were more as they were able to comprehend the VAS score better.

3.Long term follow up was not done, to comment about the peritoneal adhesions and chronic pelvic pain.

The controversies raised by this study were whether these are applicable to the general population as well and what is the sequalae of these in terms of development of adhesions or pelvic inflammatory disease.

The future research directions could be directed to look into the controversial issues raised –presence of adhesions in next caesarean section or development of chronic pelvic pain.

CONCLUSION

To conclude, if the parietal peritoneum in caesarean section is closed with chromic catgut, it results in less postoperative pain, resulting in better patient outcome.Chromic catgut is also significantly more cost effective than Polyglactin 910. Hence,Chromic catgut suture should be used to close the parietal peritoneum in caesarean section.

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