

A Prospective Study on Non-closure and Closure of Visceral and Parietal Peritoneum During Caesarean Section

H. C. Savitha¹, C. Sanjay Kumar¹, M. S. Sowmya¹

ABSTRACT

Introduction: Caesarean section is the most common surgery performed in Obstetrics and is some times associated with the morbidity. The present study was conducted to assess the short term morbidity of non-closure of the visceral and parietal peritoneum at caesarean section as compared to suturing of peritoneum.

Materials and Methods: A prospective study of two hundred women undergoing caesarean section was done; randomised into non-closure and closure groups. Preoperative, intra-operative and postoperative details were observed.

Results: Operating time, anaesthesia time and time of ambulation were significantly shorter in non-closure group. There was less postoperative pain, analgesic requirement and febrile morbidity in non-closure group. However, it was statistically not significant.

Conclusion: Non-closure of the visceral and parietal peritoneum is a simpler operative technique, more cost-effective, associated with fewer postoperative complications and lower febrile morbidity and provides a shorter surgical procedure. Hence, routine closure of peritoneum at caesarean can be avoided.

Keywords: caesarean section, peritoneum, closure, non closure.

INTRODUCTION

Caesarean section is most frequent major surgical procedure performed in obstetrics. The lower uterine segment operation pioneered by Munro Kerr in the early 20th century is now performed in over 90% caesarean sections. Since then, both visceral and parietal peritoneal layers have been traditionally closed in separate layers.¹

Recently this practise has been questioned. Animal and human studies support that closure of the pelvic peritoneum does not reduce the incidence of postoperative pain, adhesions or obstruction.²

If the peritoneum is left open, the spontaneous reperitonealization will occur within 48-72 hours with complete healing after 5-6days.³

General surgery reports have shown that suture peritonealisation tends to cause tissue ischemia, necrosis and inflammation and foreign body reactions to suture materials.⁴ This factor may slow down the healing process and are considered important precursors for adhesion formation.

Among many advantages of leaving the peritoneum includes reduced operating time, fever, intra-abdominal adhesions, less postoperative morbidity and earlier discharge from the hospital.⁵

Finally, Royal College of obstetricians and Gynaecologists (RCOG) green top guidelines suggested that non-closure appears to have fewer associated risks.

MATERIALS AND METHODS

This is a prospective study to determine the short term clinical outcome of non-closure in comparison with closure of visceral and parietal peritoneum at caesarean delivery. It was carried out at the department of obstetrics and gynaecology, Mandya Institute of Medical Sciences, mandya, Karnataka, from June 2015 to October 2015. Two hundred women undergoing emergency or elective lower segment caesarean section were taken for the study. Exclusion criteria were history of previous lower abdominal surgery, severe anaemia, presence of pelvic infections or adhesions, morbid obesity and foul smelling vaginal discharge.

After detailed history, examination and investigations, informed written consent was obtained from each patient for participation in the study. All the women underwent lower segment caesarean section through Pfannenstiel incision. Uterus was closed with continuous number one polyglactin. In the control group, both the layers of peritoneum were sutured with continuous 1-0 chromic catgut. Rectus sheath was closed with continuous number 1 polyglactin. The skin was approximated with continuous subcuticular number 2-0 ethilon. Study group had similar procedure of caesarean section but without re approximation of visceral and parietal peritoneum.

Injectable antibiotics were given for first 2 days of surgery and oral antibiotics for next five days.

After the operation, all the patients were managed in the

¹Associate Professor, Assistant Professor, Senior Resident, Department of Obstetrics and Gynecology, Mandya Institute of Medical Sciences, Mandya, Karnataka, India.

Corresponding author: Dr. C. Sanjay Kumar, #402 B, Doctor's Quarters, Mims, Mandya, Karnataka, India

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same postoperative ward. In the absence of complications, patients were discharged on the seventh postoperative day. The outcome measures noted were anaesthesia time, operating time, postoperative pain, duration of the ileus, time of ambulation, febrile morbidity, endometritis, cystitis, wound infection and length of hospital stay. Analgesic injection diclofenac sodium 75mg / tramadol 50mg intramuscularly, were given 12th hourly, in the first 24hours of the surgery and then as needed. Analgesics were changed over to oral on the second postoperative day.

Postoperative pain was assessed by 10cm visual analog scale – VAS (no pain=0, worst pain ever=10) at 24hours after surgery and daily till the time of discharge. Women were asked to indicate average intensity of pain they had experienced during last 24hours. Oral alimentation was reintroduced once bowel sounds were returned.

Febrile morbidity was defined as temperature more than 38°C on two occasions at least twelve hours apart, excluding first postoperative day. Endometritis was diagnosed if uterine tenderness, vaginal discharge and fever were present. Cystitis was diagnosed by positive urine culture growth or more than 1,00,000 colonies per ml of single species of bacteria in urine. Wound infection was diagnosed when there was serous or purulent discharge from the skin incision with erythema and induration, with or without fever. Significance of difference, if any, in the observations made of variables studied in control/study groups, in numbers or averages was determined using Chisquare (X²) or student t-test, as applicable.

RESULTS

Among the 200 women enrolled in the study, 100 study groups had non-closure while 100 control groups had closure of parietal and visceral peritoneum at caesarean section. Patient's characteristic about age, parity and gestational age has been described in table 1. Type of anaesthesia, elective or emergency caesarean data, were shown in table 2 and 3 respectively.

The outcome data is shown in table 4. The average duration of operation and anaesthesia were less by 11.5 minutes and 10.4 minutes respectively in the study group. Women in study group requiring additional analgesics, either oral or parenteral, were less than that in the control group. 21 from the study and 25 control group required additional analgesic. However, the difference was not significant. Mean total score in the study group was less as compared to that in control group.

Time of oral intake and ambulation was less in study group than in control group. The febrile morbidity was high in control group as compared to that in the study group. However it is not statistically significant. Cystitis was found in 3 cases from the study group and 5 cases from the control group.

Four from the study group had wound infection as compared to seven in the control group. The mean hospital stay in study group was 7.17days as compared to 7.29days in control group. Four from the study group and seven from the control group stayed in the hospital for more than 8 days because of wound infection.

	Non-closure n=100	Closure n=100	Statistical significance
Age (years) mean±SD	23.5 ± 4.4	22.7±3.7	t=1.3, p=0.2, not significant
Parity mean±SD	0.6 ± 1.1	0.5±1.1	t=0.4, p=0.6, not significant
Gestational age mean mean±SD	37.5±2.3	37.6±2.0	t= 0.3, p=0.6. not significant

Table-1: Patient characteristics

	Non-closure n=100	Closure n=100	Statistical significance
General Anaesthesia	19	20	X ² =0.4, p=0.4
Spinal	81	80	Not significant

Table-2: Type of anaesthesia given

	Non-closure n=100	Closure n=100	Statistical significance
Elective	13	9	X ² =0.1, p=0.8
emergency	87	89	Not significant

Table-3: Types of caesarean section

Parameter	Non-closure n=100	Closure n=100	Statistical significance
Operative time minutes mean±SD	32.7±4.9	44.2±4.61	T=16.74, p<0.0001 significant
Anesthesia time minutes mean±SD	42.1±5.03	52.5±4.67	T=16.06, p<0.0001 significant
Total pain score mean±SD	35.58±3.30	36.56±3.91	T=1.83, p=0.06
Febrile morbidity(no. of patients)	10	16	X ² =0.004, p=0.57
Time of oral intake days mean+-SD	1.34±0.47	1.61±0.49	T=1.30, p=0.19 significant
Time of ambulation days mean±SD	1.39±0.51	2.28±0.56	T=11.22, p=0.0001 significant
Wound infection (no. of patients)	4	7	X ² =0.35, p=0.55 not significant
Hospital stay days mean±SD	7.17±0.75	7.29±1.00	T=1.10, p=0.27 not significant

Table-4: Outcome data

DISCUSSION

Peritoneal non-closure in caesarean sections will certainly reduce the surgery time by few minutes which attracts many studies to advocate non-closure.⁶ Histological studies in animals have revealed that the peritoneum regenerates *denovo* and not from the cut edge of the defect as in skin wounds because the entire surface becomes mesothelialized simultaneously. Therefore peritoneal defects even large when left undisturbed demonstrate mesothelial integrity by 48 hours and complete indistinguishable healing by five days. Leaving the peritoneum open for the debris to be digested by the activity of peritoneal macrophages might be beneficial. Irrespective of the factors influencing the surgical time, in the study, there was a significant reduction in the operating time of 11.5 minutes in the study group. This finding is consistent with those of other studies who have reported shorter operative time in these groups of patients.

However, in the present study, surgical time was more than 10 minutes shorter, probably because both parietal and visceral peritoneum were left unsutured; whereas Pietrantonio *et al*, left only parietal peritoneum open and Nagele *et al*, left only visceral peritoneum open.^{7,8} The decrease in operative time reduced the duration of anaesthesia exposure and that of exposure of wound to the environmental contaminants. This is reflected in decreased incidence of febrile morbidity and has reproduced the observations made by other researchers. Non-closure of the peritoneum might reduce the intensity of the postoperative pain due to less manipulation of parietal peritoneum, which is sensitive to pain. In addition, ooze or clots in the closed peritoneal space behind uterovesical fold could be significant factor for postoperative pain in peritoneal closure groups.

Nagele *et al*, Hojberg *et al*, and others found reduced usage of oral analgesics in the study group.^{8,9,10} Present study did not show statistically significant difference in the pain medication requirement in the two groups. The mean pain score was less in study group and similar finding was also reported by Rafique *et al*.¹¹ Incidence of wound infection was less in study group compared to control group, however, it was not statistically significant. Grundsell showed a decreased incidence of wound complications in the non-closure group.¹²

CONCLUSION

Avoiding the closure of visceral and parietal peritoneum during caesarean section is associated with lesser operating time, decreased incidence of febrile morbidity, lesser need for postoperative analgesics and quicker recovery than the closure group. Hence, routine closure of peritoneum during caesarean can be avoided. However, long term studies are recommended to compare the late outcomes of peritoneal closure and non-closures during caesarean sections.

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