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COMPARATIVE STUDY OF SHORT TERM OUTCOME OF SINGLE LAYER UTERINE CLOSURE VERSUS DOUBLE LAYER UTERINE CLOSURE IN LOWER SEGMENT CAESAREAN SECTION

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ABSTRACT

Background:
Caesarean section is one of the oldest and most commonly performed surgery in the obstetrics. It had saved the lives of many mothers and fetuses in one hand and its inappropriate use can be a direct and preventable cause of maternal morbidity and mortality in other hand. The present study aimed at evaluating and assessing the advantage of single layer closure of lower segment caesarean section using 1-0 vicryl without peritonisation from the conventional double layer closure with peritonisation in terms of intra operative and short term postoperative outcomes.

Aims and Objectives:
To compare intraoperative and short term postoperative outcomes
- To compare the duration of surgery in both the groups
- To compare the amount of blood loss in both the groups perioperative Hb fall
- To compare the intra operative outcomes - number of extra haemostatic sutures needed and number of analgesics required in the first 24 hrs postoperative period
- To compare the immediate postoperative complications febrile morbidity, cystitis, wound infection,paralyticileus, ndomyometritis

INTRODUCTION:

Caesarean section is one of the oldest and most commonly performed surgery in the obstetrics. It had saved the lives of many mothers and fetuses in one hand and its inappropriate use can be a direct and preventable cause of maternal morbidity and mortality in other hand. Till today, it remains the only method by which babies are delivered when all other efforts to deliver vaginally fail.

DEFINITION:

Caesarean section is an operative procedure whereby the fetuses are delivered through an incision made on the abdominal wall (LAPAROTOMY) and uterine wall (HYSTEROTOMY) of an intact uterus after the period of viability. The term is not applied to the delivery of the fetus through an abdominal incision that is lying free in the abdominal cavity following uterine rupture or in secondary abdominal pregnancy.

Caesarean section rates have been steadily increasing worldwide in the last 20 years. With the advent of effective antibiotics, increased safety of the operation, availability of blood products, improved anaesthesia, broadening of indication of caesarean section had extended the use of caesarean section.

FACTORS FOR INCREASING CAESAREAN SECTION RATE:

The rise of caesarean section rates have been attributed to the following factors increase in previous caesarean section use of intra partum fetal monitoring and increased diagnosis of fetal distress decline in difficult operative or manipulative vaginal deliveries women's decision in making the mode of delivery identification of at risk mothers decline in vaginal breech delivery reluctance to attempt vaginal delivery after prior caesarean section.

The secondary rise in repeat caesarean section due to increase in primary section rates pose an additional factor for maternal morbidity and mortality due to associated placenta previa, accreta, urinary tract injuries, etc.,

Caesarean section has become the mode of delivery in atleast 1 in 5 deliveries. Hence it has become for any obstetrician to know the indication, technique and complications of caesarean section.

There have been many variations in the surgical technique of caesarean section. Each technique was aimed at reducing the time taken for surgery, amount of blood loss, reduce the incidence of intra operative and postoperative complications, the cost effectiveness and thereby the overall economical burden on the health.

The present study aimed at evaluating and assessing the advantage of single layer closure of lower segment caesarean section using1-0 vicryl without peritonisation from the conventional double layer closure with peritonisation in terms of intra operative and short term postoperative outcomes There are number of studies that have reported the advantage of single layer closure of uterine incision over the double layer closure. The conventional double layer closure technique was in use till 1980's. Since 1990's, single layer closure of uterine incision had come into existence in view of theoretical advantage of single layer closure with non closure of both visceral and parietal peritoneum from the double layer closure.

The theoretical advantage of single layer closure are
- lesser operating time
- lesser blood loss
- lesser tissue disruption
- less introduction of foreign material and hence less infection

Minimal tissue handling and lesser suture material use leads to lesser adhesion.

The suture material vicryl – delayed absorbable suture material, a copolymer of glycolide and l – lactide have superior properties on the wound healing and integrity when compared with chromic catgut like
- minimal tissue irritation
- higher retained tensile strength
- excellent handling property with good knot placement
- completely absorbed hydrolysis within 60 days

Generally, Pain is a complex phenomenon that precludes objective assessment. Since pain is a unique personal experience, only the patient can accurately describe the pain. visual analogue scale is used to assess the intensity of pain – a 10 cm line with anchors indicating the extent of pain, left anchor represents "none" or "no" pain and the right anchor represents "severe" or "worst

possible " pain.
Peritoneum heals by formation of new layers within 24-48 hrs. Hence if left unsutured, less postoperative pain and hence reduced need of analgesics
minimal tissue handling leads to faster resumption of bowel activity lesser adhesion formation

On the other hand, cited reasons for peritoneal closure are anatomical restoration through tissue approximation re establishment of anatomical barrier reduced incidence of wound dehiscence. The less postoperative pain after surgery has added advantage ameliorates maternal recovery early ambulation and thereby reduced risk of thrombo embolism. Hence, non closure of peritoneum has less postoperative pain and reduced wound infection and shorter hospitalization period and better cost effective procedure.

METHODOLOGY:
Ethical committee clearance was obtained from Institute' s Ethics Committee, Madras Medical College & Research Institute,Chennai -03. Two hundred subjects undergoing caesarean section are selected based on the Inclusion and Exclusion criteria .Each subject is allocated to either groups

Inclusion criteria:
emergency or elective caesarean section after 37 completed gestational weeks done for cephalopelvic disproportion
- Non progress of labour
- Failed induction
- Malpresentation like Breech,transverse lie
- Fetal distress
- Previous LSCS

Exclusion criteria:

- Chorioamnionitis
- Coagulation disorders
- Severe anaemia of Hb <7gms
- Antepartum hemorrhage
- Multiple pregnancy

History of period of amenorrhoea, last menstrual period, onset of labour pain ,h/o bleeding per vaginum or draining per vaginum noted, menstrual history, past history ,previous obstetric history were noted General and Systemic examination performed, anaemia, pedal edema noted Abdominal examination was performed to confirm gestational age, lie, presentation, position of the fetus noted. Per vaginal examination done to note the cervical effacement, dilatation, membrane status , station of the presenting part , pelvic assessment done.

Investigations like Hb, blood grouping and typing, H I V, Hb s Ag were sent.

Informed consent is obtained from all the women .100 women randomized to single layer uterine closure with 1-0 vicryl with nonclosure of both visceral and parietal peritoneum and 100 women to conventional double layer closure with chromic catgut with peritonisation.

Preoperative procedure:
- Consent for the procedure obtained
- Preparation of abdomen and perineum
- Elective caesarean section patients are kept nil oral for 8 hrs
- Indication of the procedure noted
- High risk factors like PIH , PROM ,GDM, anaemia are noted
- IV line secured and blood for cross matching taken Pre op Hb noted
- Inj.ampicillin 1g iv after test dose given
- Inj. Ranitidine 50 mg iv and Inj .perinorm 2 ml im stat given Bladder catheterized
- Anaesthesia given according to anaesthesiologists choice-spinal or epidural or general anaesthesia

Procedure:

Under anaesthesia patient in supine position with 15' tilt to the left side Time noted from skin opening to skin closure Abdomen opened by Pfannensteil incision Blunt dissection of the layers carried out Peritoneum opened Dextrorotation corrected.

UV fold of peritoneum identified ,cut and bladder pushed down Lower uterine segment identified Lower segment caesarean section done Baby delivered

Inj. Syntocinon 10 units added to the drip Cord clamped cut and baby handed over to paediatrician

Uterine incision closed with 1-0 vicryl by continous locking sutures with nonclosure of visceral and parietal peritoneum in single layer groups and with 2 or 1 chromic catgut by double layer with peritoneal closure in double layer groups.

No of hemostatic sutures needed- noted Extension of incision , PPH noted Rectus sheath closed with 1-0 prolene Subcutaneous tissue sutured if depth more than 2 cms Skin approximated either by mattress or subcuticular stitches

Postoperative monitoring:
- All subjects are monitored in the postoperative ward Half hrly pulse chart, fourth hrly BP monitored
- Any bleeding per vaginum observed for the first 24 hours
- Early oral fluids 8 hrs after surgery followed by liquid diet on the 1st postoperative day and semisolid diet on the 2nd postoperative day.

Results and Discussions:
The present study was done in department of obstetrics & gynaecology, INSTITUTE OF OBSTETRICS & GYNAECOLOGY, Egmore. This study conducted from January -2013 to December 2013. This study included two hundred subjects . The study groups (group I) consists of 100 cases , under went single layer closure of uterine incision with non closure of peritoneum with vicryl and the control groups(group II) consists of 100 cases who underwent double layer closure of uterine incision with peritonisation in both the group. Abdomen opened by Pfannenstiel incision.Total no of vaginal deliveries and Caesarean section in our hospital from January 2013 to December 2013 were as follows

TABLE:1 MODE OF DELIVERY

Mode of delivery	No of cases	Percentage %
Vaginal deliveries	7396	65.6%
Caesarean deliveries	3876	34.4%
Total	11,272	

Total number of deliveries during the period of the study in our hospital was 11,272 giving the incidence of vaginal deliveries 65.6% and caesarean deliveries 34.4 %

TABLE 2 SHOWING THE MATERNAL AGE IN BOTH THE GROUPS

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Age in years	Study Group	100	24.71	3.891	.389
	Control Group	100	25.07	3.331	.333

The mean age group in the study group is 24.71 and in control group is 25.07

TABLE 3 SHOWING THE COMPARISON OF THE TYPE OF OPERATION IN BOTH THE GROUPS

Type of Operation	Groups	Total			
	Study Group	Control Group			
Elec/	Elec	Count	24	16	40
		% within Elec/Emer	60.00%	40.00%	100.0%
		% within Group	24.00%	16.00%	20.0%
	Emer	Count	76	84	160
		% within Elec/Emer	47.50%	52.50%	100.0%

		% within Group	76.00%	84.00%	80.0%
Total	Count	100	100	100	
	% within Elec/Emer	50.0%	50.00%	50.00%	
	% within Group	100.0%	100.00%	100.00%	

The single layer uterine closure (group I) performed in elective LSCS was 24% and in emergency LSCS was 76% and that of the double layer uterine closure method was 16% and 84% respectively In the study, most of the LSCS in the study group and control group were emergency sections.

Table:4 SHOWING AMBULATION AND DURATION OF HOSPITAL STAY IN BOTH THE GROUPS

	Group	N	Mean	Std. Deviation	Std.Error Mean
Ambulation	Control Group	100	10.44	1.647	0.165
	Study Group	100	11.40	1.902	0.190
Duration of Hospital Stay	Control Group	100	7.32	0.566	0.057
	Study Group	100	7.47	0.717	0.072

The average time of ambulation was 10.4 in the study group and 11.4 in the control group and the P value is 0.000 which is significant

DISCUSSION:

Caesarean section is one of the oldest and commonest procedure in obstetrics. There have been a steady increase in the incidence of caesarean section in various part of the world. The incidence differs from hospital to hospital and in geographic distribution.
WHO conducted a study on reviewing 1,00,000 births from nine Asian countries in the year 2007-2008 and found 27% of the births are caesarean deliveries. The present study has an incidence of 34.4%.

The present study is a randomized controlled study to compare single layer closure of uterine incision with 1-0 vicryl with non closure of visceral and parietal peritoneum from double layer closure of uterine incision with chromic catgut with peritoneal closure.

Hemostasis is usually achieved during single layer closure of uterine incision. Second layer suturing does not have any evidence for additional strength of the uterine wound . in fact it prolongs the operating time, increases the number of punctures ,additional suture material may act as nidus for infection and inhibits the better wound healing.

INTRAOPERATIVE FINDINGS:

In the study , most of the subjects needed extra hemostatic sutures are in the range of 1 to 2 (49% needed 1 suture,33% needed 2 sutures) in the single layer uterine closure whereas in the control group, sutures needed in most of the subjects are in the range of 2 to 3 (44% needed 2 sutures and 41% needed 3 sutures) with a significant p value 0.000.

Tischendorf et al study showed 21% needed extra hemostatic sutures in single layer groups and 22.6% in the double layer closure groups.

In the study , 2 cases had extension of incision in the study group and 2 cases in the double layer closure groups.
2 cases of PPH seen in both the groups and are managed with Inj. Prostodin 1 ml im and 1ml intramyometrial injection given Inj Syntocinon 20 units added to the drip ,800 microgram of misoprostol kept per rectally

AMOUNT OF BLOOD LOSS:

Since it is technically difficult to measure the amount of blood loss due to Mixture of blood and amniotic fluid in the suction apparatus and the spillage of Blood .Hence perioperative Hb fall from the preop Hb and the postop Hb is calculated . The study had aperioperative Hb fall of 0.86% in the study group and 0.94% in the control group with a P value of 0.058 which was significant

NUMBER OF ANALGESICS REQUIRED:

No of analgesics required in the study group was less compared with the control group , maximum no of patients required in the range of 1 to 2 in the study group and 2 to 3 doses in the control groups and p value of 0.000

IMMEDIATE POSTOPERATIVE COMPLICATIONS:

In the study, febrile morbidity in the study group is 4% and 8% in the control group

Various studies comparing the febrile morbidity

	Present Study	Sood Atul kumar et al	Grundsell et al	Naegele et al
Single Layer Group	4%	11.8%	1.7%	8.4%
Double Layer Group	8%	23.6%	3.8%	15.4%

Wound infection seen in 4 cases in the study group and 5 cases in the control group ,out of which 1 case in the study group and 3 cases in the control groups had wound resuturing and the various studies are compared and did not had significant p value .

Studies comparing wound infection

	Present study	Sood Atul kumar et al	Naegele et al	Hull & varner	Peitratoni et al	Grundsell et al
Single Layer Group	4%	3.9%	1.9%	5.6%	5.6%	2.2%
Double Layer group	5%	8.5%	4.9%	8.5%	8.6%	3.2%

2 cases in study group and 2 in control group had paralytic ileus. No cases had Endometritis.

Ambulation period and duration of hospital stay was less in the study group compared with the control groups with a significant p value.

Hence ,the present study had reduced operating time, reduced perioperative Hb fall, reduced postoperative pain , decreased number of extra hemostatic sutures with statistical significance , reduced febrile morbidity and wound infection in the single layer closure without peritonisation from the double layer uterine closure with peritonisation which is similar to that reported in other studies.

The long term outcome of the present study on the maternal and perinatal morbidity like uterine dehiscence and rupture on the subsequent pregnancy was not studied.

Hence many more number of prospective studies should be conducted to assess the superiority of single layer uterine closure without peritonisation from the conventional double layer closure with peritonisation on the short term and long term outcomes of the scar integrity on the subsequent delivery and the standard protocols on the suturing technique of caesarean section .

SUMMARY AND CONCLUSION:

Caesarean section is one of the most commonly performed surgical procedure in obstetrics. But only little information have been available on the optimal technique of caesarean section and it differs from time to time.

The incidence of caesarean section in the present study is 34.4% The common indication was cephalo pelvic disproportion in both the groups The other indications were prev lscs, malpresentations like breech, transverse lie, long period of infertility ,etc. The mean duration of surgery in both the groups was 29.91 mins and 37.5 mins and the average reduction in the duration of 7.5 mins in the single layer closure groups with a significant p value 0.000.The perioperative fall in hemoglobin in single layer group was 0.86 from that of 0.94 and was significant with a p value of 0.000.

The extra hemostatic sutures needed in the range of 1 to 2 in

single layer group as compared with 2 to 3 sutures in double layer group and with a significant p value of 0.000.

Febrile morbidity and wound infection were significantly lower in the single layer group but did not have statistical significance .

Hence in conclusion, comparing the single layer uterine closure with 1-0 vicryl with non closure of both the peritoneum from the double layer closure with peritonisation, single layer uterine closure has reduced operating time , reduced perioperative fall in hemoglobin , reduced postoperative pain ,reduced number of hemostatic sutures with all bearing its statistical significance and reduced febrile morbidity and hence reduced costeffective ratio overall .