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Comparative Study of Uterine Repair during Caesarean Section – Intra-Abdominal Vs Exteriorisation of Uterus

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Abstract:
Background: *The safety of the technique of uterine exteriorisation during Caesarean delivery though popular among obstetricians, remains controversial.*
Objective: *To evaluate the effect of exteriorisation of uterus during uterine repair on Caesarean morbidity.*
Method: *In this hospital based prospective study 200 women who underwent Caesarean delivery, were included. The women were randomly allocated in two groups 100 of each. Variables analysed were operative time, perioperative blood loss, length of hospital stay and postoperative morbidities.*
Results: *The estimated perioperative blood loss, period of hospital stay and post operative febrile morbidity were significantly less in the exteriorised group than the intra-abdominal group, (P = 0.001, 0.001 & 0.005 respectively). Operative time is little shorter in exteriorisation group as compared to intra abdominal group. But there was no significant difference between two groups with respect to other outcome measures.*
Conclusion: *Exteriorisation of uterus for repair following Caesarean delivery is not associated with significant problems and it is associated with less blood loss, shorter operative time, decreased hospital stay and less febrile morboidity.*
KeyWords: *Caesarean section, Uterine repair, Exteriorisation, Intra-abdominal repair, Maternal outcome, Neonatal outcome.*

I. Introduction

Caesarean section is the most common intra-abdominal surgical procedure in obstetrics. There is conflicting opinion among obstetricians as to whether one should routinely exteriorised the uterus to facilitate repair during Caesarean section or alternatively suture the uterine incision while the uterus lies intra-abdominally.

The technique of uterine exteriorisation at Caesarean section was described by Sanger in 1882 and modified by Leopold two years later[1]. In this century Ports and Phaneuf advocated it.[2] Hershey and Quilligan[3] found that exteriorisation of the uterus was associated with a smaller decrease in post-operative haematocrit than if the uterus was sutured intraperitonially and although there was no increase in morbidity, there was a sub-group of women in whom the uterus was sutured intraperitonially who experienced increased blood loss. The authors concluded that exteriorisation of the uterus at Caesarean section is not to be condemned. Magann et. al [4] found that uterine position during Caesarean section has no effect on the blood loss. However in a similar study by the same authors[5], it was found that exteriorisation of the uterus and manual removal of placenta did increase infectious morbidity and length of hospital stay. Consequently they did not recommend this technique for uterine repair.

Our present study was performed to assess intra-operative advantages and disadvantages and post operative morbidity following exteriorization of the uterus at Caesarean section, as compared to intra-abdominal repair of the uterus, and also to determine the surgical benefits and problems associated with the practice of routine exteriorisation of the uterus to facilitate repair at Caesarean section.

II. Methods

This hospital based prospective study included 200 women who underwent caesarean section either emergency or elective at B.S. Medical College Bankura from July 2012 to June, 2013. The woman were randomly allocated into 2 groups, 100 in each group. Inclusion criteria were all women undergoing caesarean section after the age of viability. Patients with classical caesarean section, hysterotomy, extensive adhesion, ruptured uterus and Chorioamnionitis were excluded from the study.

Lower uterine segment caesarean section through Pfannestiel incision, was performed with repair of uterine incision in two layers, visceral and parietal peritoneum were not sutured.

Data on operative time perioperative decrease in haemoglobin concentration, febrile morbidity, endometritis, cystitis, wound infection and neonatal outcome were noted. Finally collected data were analysed with the help of basic statistical methods and some common statistical software. A 'P' value less than 0.05 was considered statistically significant.

III. Results

200 women included in the analysis were divided into 100 in whom the uterus was exteriorised for repair and 100 in whom uterus was not exteriorised.

Table 1 shows the comparison of maternal age between two groups. There was no significant difference between two groups with respect to age (P=0.393).

Table – 2 shows the comparison of gravid between two groups. In the exteriorisation group 46 women (46%) were primigravida and in the intra-abdominal group 39 (39%) women were primigravida. Second gravid were 41 cases in the exteriorisation and 33 cases in the intra-abdominal group. Third gravida were 10 and 18 cases in the exteriorised and intra-abdominal group respectively. With respect to fourth gravid there were 7 cases of fourth gravida in the intra-abdominal group and only 1 case in the exteriorised group. There was no significant difference between the two groups with respect to gravid (P=0.069).

Table 3 shows comparison of gestational age between two groups. Most of the women undergoing caesarean section were in term gestation. 95 and 96 cases were in the exteriorised and intra-abdominal group respectively. Only 5 cases out of 100 cases in the exteriorised group and four cases out of 100 in the intra abdominal group were preterm. There was no significant difference between two groups with respect to the period of gestation (P=0.733).

Table 4 shows comparison of operating time between groups. Length of procedure (operating time) is little shorter in exteriorised group as compared to intra-abdominal group (P=0.105).

Table 5 shows the comparison of peri-operative haemoglobin decrease between two groups. In exteriorisation group mean haemoglobin concentration before surgery was 9.6 ± 0.84 and after surgery it was 8.8± 0.84. so the mean difference in haemoglobin concentration i.e. peri-operative haemoglobin decrease is 0.83± 0.10. But in intra abdominal group mean haemoglobin concentration before surgery was 9.9± 1.00 and after surgery it was 8.6± 0.95. So the mean difference of haemoglobin concentration i.e. peri operative haemoglobin decrease is 1.26 ± 0.18. So it has been found that peri-operative haemoglobin decrease is more in intra-abdominal group than the exteriorisation group, which is statistically significant (P=0.001).

Table 6 shows the maternal outcomes. There were 6 cases out of 100 i.e. 6% in the exteriorised group and 19 cases out of 100 i.e. 19% in the intra-abdominal group who had febrile morbidity. So the intra-abdomional group had thrice the number of febrile morbidity compare to the exteriorised group, which is statistically significant (P=0.005). There were four cases out of 100 in the exteriorised group who had cystitis and 5 cases cystitis in the intra-abdominal group which was diagnosed by a positive urine culture test. There was no significant difference between two groups with respect to cystitis (P=0.733). There were 4 cases out of 100 in the exteriorised group and 6 cases out of 100 in the intra-abdominal group who had endometritis. There was no significant difference between the two groups with respect to endometritis (P=0.516). the wound infection rate among the exteriorised group of 3% (3) was lower than 5% (5) in intra-abdominal group, however it was not statistically significant (P=0.470).

Table 7 shows comparison of APGAR score of new born at fifth minute. There was no significant difference between two groups (P=0.65).

Table 8 shows the comparison of period of hospital stay. It has been found that period of hospital stay is more in the intra-abdominal group compared to the exteriorisation group, because of more number of cases of febrile morbidity in this group. It is statistically significant (P=0.001).

IV. Discussion

The rate of caesarean section is gradually increasing worldwide. Technique that reduce the maternal morbidity are therefore important to identify.

In our present study there is no significant difference between the two groups regarding maternal age. This is supported by the study conducted by Sood et.al [6]. In our study there is no statiscally significant difference in regard to the gestational age between the two groups. This is also supported by the study conducted by Sood et.al.[6]. In our study operating time is little shorter in exteriorised group as compared to intra-abdominal group but it is statistically not significant. Similar to that reported by Sood (2003)[6] and Edi-Osagie et.al [7] . In this present study exteriorisation of uterus is associated with a smaller reduction in haemoglobin concentration than suturing the uterus intra-abdominally and therefore agrees with the study by Hershey and Quilligan [3]. Significantly lower febrile morbidity found in our study in the exteriorisation group, similar to that reported by Sood (2003)[6] and Wilkinson (2000)[8]. But some other studies conducted by Wahab et.al[9] and Ed-Osagie et.al[7] reported no difference in the incidence of febrile morbidty.

In significant trend towards decreased infectious morbidity in the form of endometritis, cystitis and wound infection was noted in our present study which is similar to that reported by Sood et.al [6] and Wilkinson et.al[8]. However, Wahab et.al[9] Magann et.al[4] reported higher infectious morbidity with exteriorisation of uterus and manual removal of placenta.

In our present study there is a significant difference between the two groups regarding the period of hospital stay (P=0.001). It is more in intra-abdominal group and less in the exteriorisation group. But according to Edi-Osagie et.al[7] and Sood et.al[6] there was no significant difference between the two groups with regard to the period of hospital stay. However, Magann et.al[4] have reported longer hospital stay in the exteriorisation group which is not so in the present study.

In conclusion exteriorisation of uterus for repair following caesarean delivery is not associated with significant problems and it is associated with less blood loss, shorter operating time, decreased hospital stay and less febrile morbidity. So exteriorisation of uterus at caesarean section is a valid option but needs further large multi centric control trial.

Table – 1Comparison of Maternal Age

Age Group (Yrs)	Exteriorisation Group	Intra-abdominal Group	Total
< 20	37	25	62
21 – 25	38	40	78
26-30	19	27	46
31-35	5	7	12
>35	1	1	2
Total	100	100	200

Chi-square = 4.099, P = 0.393

Table – 2Comparison Of Gravida

Gravida	Exteriorisation Group	Intra-abdominal Group	Total
Primi Gravida	46	39	85
G2	41	33	74
G3	10	18	28
G4	1	7	8
G5	1	3	4
G6	1	0	1
Total	100	100	200

Chi-square = 10.227, P = 0.069

Table – 3Comparison Of Gestational Age

Gestational Age	Exteriorisation Group	Intra-abdominal Group	Total
Term	95	96	191
Preterm	5	4	9
Total	100	100	200

Chi-square = 0.116, P = 0.733

Table – 4Comparison Of Operating Time

Time in minutes	Exteriorisation Group	Intra-abdominal Group	Total
30-35	12	8	20
36-40	60	50	110
41-50	28	42	70
Total	100	100	200

Chi-square = 4.509, P = 0.105

Table – 5Comparison Of Peri-Operative Haemoglobin Decrease

	Hb before surgery (Mean ±SD)	Hb after Surgery (Mean ±SD)	Difference (Mean ±SD)
Exteriorisation	9.6 ± 0.84	8.8 ± 0.84	0.83 ± 0.10
Intra-abdominal	9.9 ± 1.00	8.6 ± 0.95	1.26 ± 0.18

P = 0.001

Table – 6Maternal Outcomes In Two Groups

Variables	Exteriorisation Group N=100(%)	Intra-abdominal Group N=100 (%)	Chi-square	P value
Febrile Morbidity	6 (6%)	19 (19%)		0.005
Cystitis	4(4%)	5(5%)	0.116	0.733
Endometritis	4 (4%)	6(6%)	0.421	0.516
Wound Infection	3 (3%)	5(5%)	0.521	0.470

Table – 7Comparison Of Apgar & Fifth Minute

APGAR	Exteriorisation	Intraabdominal
Less than 7	2	3
7 or > 7	98	97

Chi Square : 0.22, P Value 0.65

Table – 8Comparison Of Period Of Hospital Stay

No. of days	Exteriorisation Group	Intra-abdominal group	Total
5	0	3	3
6	95	73	168
7	5	21	26
8	0	2	2
9	0	1	1
Total	100	100	200

Chi Square : 18.727 P =0.001

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