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Research Article

STUDY OF EFFECTS OF SPONTANEOUS DELIVERY OF PLACENTA VERSUS MANUAL REMOVAL OF PLACENTA DURING CESAREAN SECTION AT TERTIARY CARE CENTRE

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ABSTRACT

Objectives: The aim of the study was to compare the effects of manual removal of placenta and spontaneous delivery of placenta during cesarean section.

Methods: This was a hospital-based prospective comparative study conducted in the Department of Obstetrics and Gynecology, Jhalawar Medical College, Jhalawar. 400 antenatal women at term and singleton pregnancy posted for cesarean section from October 2018 to September 2019 for 1 year duration. The study populations were divided into two groups (200 each). Group A in whom placenta deliver spontaneously and Group B in whom placenta was removed manually. Comparison was done in term of blood loss, fever, endometritis, and delayed complications.

Results: The manual removal of placenta associated with greater blood loss ($p<0.0001$, statistically significant), the greater fall in hemoglobin ($p<0.0001$, statistically significant). Manual removal of placenta was associated with leukocytosis ($p=0.0009$), higher incidence of fever, post-operative uterine tenderness, and sub involution of uterus ($p<0.05$ statistically significant). This is reflected by increased incidence of endometritis with manual removal ($p=0.001$, Significant). The overall time taken between delivery of baby to delivery of placenta was significantly lesser in manual removal method ($p<0.0001$).

Conclusion: Manual method seems to decrease the time interval between delivery of baby and that of placenta. Manual removal of placenta does more harm than benefit by increasing the incidence of fall in hemoglobin and delayed complication.

Keywords: Manual removal placenta, Cesarean section, Tertiary center.

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INTRODUCTION

Cesarean section rates are rising worldwide and becoming a cause of concern as it has been shown to be positively associated with maternal mortality and severe morbidity, even after adjusting for risk factors [1]. Cesarean section is the most common major operation performed on women. Some of the short-term morbidities of cesarean section include hemorrhage [2], need for blood transfusion, post-operative fever, and endometritis [3]. Long-term morbidities include placenta previa, placenta accrete, and ectopic pregnancy. Some of complications mentioned increased by different ways of performing cesarean section operation and variation in techniques [4].

On an average <1 L of blood is lost during cesarean section [5]. By the end of the third trimester, the uterus is perfused by 500–700 ml blood/min. This physiological hyper perfusion leads to an estimated loss of approximately 1 liter of blood at cesarean section [6]. Estimation of blood loss during cesarean section is paramount for reducing morbidity arising from the procedure [7]. However, its accuracy is extremely difficult and poorly reproducible and is usually underestimated [8]. As life-threatening hemorrhage may arise as a complication of cesarean section, adequate measures should be taken to decrease blood loss during and after the procedure [9].

The method of delivering the placenta is one procedure that may contribute to an increase or decrease in the blood loss during cesarean section. Some experts manually cleave the placenta from the decidua basalis and remove it from the uterus, while others prefer to wait for spontaneous delivery [10].

As soon as baby is delivered out of uterus, its size starts involution by contraction and retraction of muscle-fibers and uterine sinuses are closed by the so called living ligature. This process proceeds naturally and takes its own time if placenta is allowed to separate spontaneously [11].

Many study trials have shown the spontaneous delivery of placenta methods to be superior over manual method because of reduced intra-operative blood loss and reduced incidence of post-operative endometritis. Rational for study is whether the practice of manual removal of placenta at cesarean section should continue or not.

Following are the aims and objective of present study

Aim

The aim of the study was to compare the effects of manual removal of placenta and spontaneous delivery of placenta during cesarean section.

Objectives

The objectives of the study were to compare the amount of blood loss, postpartum hemorrhage, postpartum endometritis, delayed complication, and the time taken in spontaneous delivery of placenta with manual removal of placenta during cesarean section.

METHODS

Study design

The present study is a hospital-based prospective comparative study. It was conducted in the Department of Obstetrics and Gynecology, Jhalawar Medical College at SHKBM hospital Jhalawar.

Sample size

400 antenatal women at term and singleton pregnancy admitted to the labor room and posted for cesarean section from October 2018

to September 2019 for 1 year duration. The study populations were divided into two groups.
Group A comprised 200 women in whom placenta was allowed to deliver spontaneously.
Group B comprised 200 women in whom placenta was removed manually.

Sampling technique
Systematic random allocation.

Inclusion criteria
Antenatal women at term and singleton pregnancy posted for cesarean section were included in the study.

Exclusion criteria
Placenta previa, accidental hemorrhage, Morbidly adherent placenta, Preterm pregnancy, Risk of PPH-multifetal gestation, polyhydramnios, large baby (≥4 kg), malformation of uterus, uterine fibroids, drugs-use of tocolytic drugs (Ritodrine, lsoxsuprine, MgSO4, and Nifedipine) in preceding 48 h, blood coagulation disorders (acquired or congenital)-Jaundice in pregnancy, thrombocytopenic purpura, Grand-multigravida, Mal-presentation, and Rh Negative Pregnancy.

After considering the inclusion and exclusion criteria, all the subjects were recruited in the study. They were subjected to detailed history taking, complete general, physical examination, systemic examination, and obstetric examination were done. Women undergoing elective or emergency cesarean section were eligible after consent. Randomization done by selection of first case by lottery system and every alternate case allocated as spontaneous and manual removal of placenta. For women allocated Group A, a gentle traction was applied to the cord and spontaneous separation of placenta was awaited. In the manual removal group (Group-B) hand was introduced between placenta and uterine wall to detach and remove the placenta by sawing movement. Time taken between delivery of baby to delivery of placenta was noted.

Blood loss estimation was evaluated by taking into account the volume of liquid suctioned during the operation minus the estimated volume of liquor suctioned before delivery of placenta. All soaked sponges were weighed in grams and the blood loss was measured in ml. Post-operative endometritis was defined by the presence of any two of the following: Fever, uterine tenderness, sub-involution of uterus, and leukocytosis, All patients were followed for 6 weeks for delayed complications: Anemia of severe grade and puerperal sepsis.

Statistical analysis
All the data were entered in Excel Sheet and the data were analyzed statistically using SPSS software 20.0 (trial version). Quantitative data were summarized in mean and standard deviation. The difference in mean value was analyzed using independent sample "t"-test. Qualitative data were summarized in proportion and analyzed using Chi-square and "Z" test. $p<0.05$ was considered statistically significant. All the statistical analysis was done keeping power of study at 80% and 95% confidence level.

RESULTS

Out of 400 women undergoing cesarean section: 200 (Group A) had spontaneously expelled placenta and the other 200 (Group B) underwent manual removal of the same. The mean age of the study population was 24.42 years. Group A: Mean±SD =24.50±3.06 years. Group B: Mean±SD= 24.34±3.00 years. p=0.8115 non-significant (Table 1).

The mean amount of blood loss in Group A and Group B was 320.25±154.15 ml and 436.30±201.01 ml, respectively, which shows greater amount of blood loss associated with manual removal of placenta ($p<0.0001$) (Table 2).

The mean fall in hemoglobin was 0.75±0.46g% in Group A and 1.01±0.63g% in Group B which shows that significantly lesser fall in hemoglobin in spontaneous removal ($p<0.0001$) (Table 3).

Fever was present in only 10 (5.00%) out of 200 patients in Group A, and 29 (14.50%) patients in Group B, making a total of 39 (9.75%) of 400 women. The result was statistically significant (p = 0.0013) (Table 4).

The overall time taken between delivery of baby to delivery of placenta was significantly lesser in manual method (31.54±8.02 s) as compared with spontaneous one (45.68±5.12 s) ($p <0.0001$).

Delayed complications in cesarean section observed for 6 weeks postpartum, such as wound infection and gaping, anemia of severe grade and puerperal sepsis. Five patients in Group A (2.50% of 200) developed delayed complications as compared to 12 patients in Group B (6.00% of 200). This makes a total of 17 (4.25% of 400) patients suffering from delayed complications. This finding is statistically non-significant p=0.0826) (Table 5).

The overall incidence of postpartum hemorrhage is 3.25% (13 out of 400 women). Amongst them nine were from Group B and 4 from Group A. Difference in the present study was statistically not significant p=0.1585.

Table 1: Distribution of study population according to maternal age groups

Age Groups (In years)	Group A		Group B		Total	
	No.	%	No.	%	No.	%
≤19	6	3.00	6	3	12	3
20–24	110	55.00	108	54	218	54.5
25–29	68	34.00	76	38	144	36
30–34	16	8.00	10	5	26	6.5
Total	200	100	200	100	400	100

Table 2: Comparison of blood loss in spontaneous (Group A) versus manual (Group B) removal of placenta in cesarean section

Amount of blood loss (ml)	Group A		Group B		Total	
	No.	%	No.	%	No.	%
<250	77	38.5	45	22.50	122	30.5
251–500	103	51.5	93	46.5	196	49.00
501–750	17	8.5	46	23.00	63	15.75
>751	3	1.50	16	8.00	19	4.75
Total	200	100	200	100	400	100

Table 3: Comparison of post-operative fall in hemoglobin in spontaneous (Group A) versus manual (Group B) removal of placenta in cesarean section

Fall in Hb (Gm %)	Group A		Group B		Total	
	No.	%	No.	%	No.	%
<1	169	84.50	131	65.50	300	75.00
1.1–2.5	28	14.00	64	32.00	92	23.00
>2.5	3	1.50	5	2.50	8	2
Total	200	100	200	100	400	100

Table 4: Comparison of post-operative fever in spontaneous (Group A) versus manual (Group B) removal of placenta in cesarean section

Post-operative fever	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	10	5.00	29	14.50	39	9.75
Absent	190	95.00	171	85.50	361	90.25
Total	200	100	200	100	400	100

Table 5: Comparison of delayed complications in spontaneous (Group A) versus manual (Group B) removal of placenta during cesarean section

Delayed complications	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	5	2.50	12	6.00	17	4.25
Absent	195	97.50	188	94.00	383	95.75
Total	200	100	200	100	400	100

Table 6: Comparison of post-operative Endometritis in spontaneous (Group A) versus manual (Group B) Removal of placenta during cesarean section

Post-operative endometritis	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	9	4.50	28	14.00	37	9.25
Absent	191	95.5	172	86	363	90.75
Total	200	100	200	100	400	100

Table 7: Comparison of post-operative uterine tenderness in spontaneous (Group A) versus manual (Group B) removal of placenta during cesarean section

Post-operative uterine tenderness	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	7	3.50	18	9.0	25	6.25
Absent	193	96.50	182	91	375	93.75
Total	200	100	200	100	400	100

The occurrence of post-cesarean endometritis in our study population, 37 (9.25%) out of 400 women developed endometritis, out of which 28 (14.00%) belonged to Group B and only 9 (4.50%) were in Group A. This finding is statistically significant with p<0.001) (Table 6).

Manual removal of placenta was associated with higher incidence of fever (Table 4), post-operative uterine tenderness (X2=22.902, df=1, p<0.0001 Significant) (Table 7).

Sub involution of uterus (X2=4.433, df=1, p=0.00352 significant) (Table 8).

Leukocytosis (X2= 0.981, df=1, p-value=0.0009, Statistically Significant) (Table 9).

This is reflected by and increased incidence of endometritis with manual removal of placenta as compared to spontaneous delivery of placenta (X2=10.751, df=1, p=0.001, Significant).

DISCUSSION

In this study, we compare between two groups of patients concerning placental delivery during cesarean section (spontaneous placental delivery and manual removal of the placenta).

The overall time interval between the delivery of the baby and that of the placenta was 45.68±5.12 s in Group A (spontaneous removal) and 31.54±8.02 s in Group B (manual removal). The difference between the two was statistically significant (p<0.0001). Hence, we observed that manual removal of placenta takes lesser time than spontaneous removal of placenta.

In the current study, mean amount of blood loss in Group A was 320.25±154.15 ml, whereas in Group B was 436.30±201.01 ml. Blood loss was significantly higher (p<0.0001) in those with manual removal

Table 8: Comparison of post-operative sub-involution of uterus in spontaneous (Group A) Versus manual (Group B) removal of placenta during cesarean section

Post-operative uterine sub-involution	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	7	3.50	17	8.50	24	6
Absent	193	96.50	183	91.50	376	94
Total	200	100	200	100	400	100

Table 9: Comparison of post-operative Leucocytosis in spontaneous (Group A) versus manual (Group B) removal of placenta during cesarean section

Post-operative Leukocytosis	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Present	25	12.5	51	25.50	76	19.00
Absent	175	87.5	149	74.50	324	81
Total	200	100	200	100	400	100

of placenta. This correlates with the study of Anorlu *et al*. [12] and El Garhy *et al*. [13] observed that blood loss in spontaneous group was 434.09±178.52 ml and manual group was 505.08±150.14 ml with p<0.001. Anorlu *et al*. [12] observed that blood loss >1000 ml (RR 1.81, 95% confidence interval [CI] 1.44 to 2.28; 872 women) was seen more frequently with manual removal placenta in cesarean section. Gol *et al*. [14] suggested that manual delivery of the placenta is not associated with any significantly greater risk of blood loss.

In the current study, we found that the mean fall in hemoglobin in Group A was 0.75±0.46 g% as compared to 1.01±0.63 g% in Group B. Fall in hemoglobin was higher in manual removal of placenta (Group B). This finding is similar to that studied by Anorlu *et al*. [12], Fareesa *et al*. [15], Ramadani *et al*. [6], and Baksu *et al*. [5]. Fareesa *et al*. [15] found that manual removal of placenta associated with a higher incidence of difference in hemoglobin greater than 2 g/dl (pre and post-operatively). The study conducted by Chandra *et al*. [16] refutes this finding. They found that the change in hemoglobin, reflecting operative blood loss, was similar in both groups (1.81 and 1.72 g/dl, respectively).

In the current study, we found that post-cesarean endometritis is seen more commonly seen in Group B (manual). This correlates with the study of several groups, some of whose names are: Anorlu [12], Wilkinson *et al*. [17], Dehbashi *et al*. (2004) [14], Baksu *et al*. [5], Lasely *et al*. (1997) [18], and Atkinsons *et al*. (1996) [19]. Wilkinson *et al*. (2007) [17] found manual removal to be associated with increased postpartum endometritis (odds ratio 5.44, 95% CI 1.25–23.75). McCurdy *et al*. (1992) [20] found postpartum endometritis was seven fold greater in manual removal. In contrast, Chandra *et al*. (2002) [16] did not find any significant difference in the two methods of placental removal, 1.7% in spontaneous group and 2.5% in manual group.

In the current study, we found that manual removal of placenta leads to more incidence of delayed complications. This correlates with the study of Lasely *et al*. (1997) [18] found wound infections significantly being frequent if placenta was separated manually (relative risk 0.6, 95% CI 0.4–0.09, p=0.01) Merchavy *et al*. (2007) [21], and Anorlu *et al*. (2008) [12]. Merchavy *et al*. (2007) [21] found no statistically significant difference between the two methods of removal of placenta regarding the risk for wound infection (3.7% in manual removal compared with 2.1% in spontaneous method; p=0.495).

CONCLUSION

The present study and past studies show that however placental removal by manual method in cesarean section seems to decrease the

time interval between delivery of baby and that of placenta, it does not affect the total operating time significantly. Manual removal of placenta does more harm than benefit by increasing the incidence of fall in hemoglobin, associated with likelihood of complications in terms of blood loss, endometritis, and delayed complication.

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AUTHOR CONTRIBUTIONS

Manisha Singhal[1] - Prepare study question, draft for study, and take permission from Institutional ethical committee and data analysis. Nidhi Meena[2] - Helps in data collection Savitri Sharma[3] - Helps in data collection Naresh Kumar Meena* - Prepare abstract and final manuscript

CONFLICT OF INTEREST

None.

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ETHICAL APPROVAL

Ethical approval was taken from institutional ethical committee of Jhalawar Medical College, Jhalawar before starting the study.

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