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Maternal and Fetal Outcomes in Reversed Breech Extraction vs. Head Lifting Method During Caesarean Section

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ABSTRACT

Background & Objective: Obstructed labour during caesarean section makes foetal head delivery difficult for obstetricians. The present study was conducted with aim to evaluate maternal and fetal outcome in reversed breech extraction vs. head lifting method during caesarean section.

Materials & Methods: This prospective case-control study was conducted from January to November 2022 at obstetrics departments of Basrah Maternity and Child Hospital, Iraq. A total of 88 women who met inclusion criteria were randomly divided into two groups reverse breech extraction and head lifting. The two groups were compared in terms of maternal and fetal outcomes. P<0.05 was considered statistically significant.

Results: Reversed breech extraction and head lifting groups were not significantly different in terms of demographic and pregnancy related characteristics (P>0.05). However, reversed breech extraction group compared to head lifting group had significantly lower uterine artery injury (P=0.0001), uterine extension (P=0.0001), blood transfusion (P=0.003), operation time (P=0.0001), and postoperative HB level (P=0.026). Moreover, there was significant difference between reversed breech extraction and head lifting groups regarding birth weight (P=0.016), first and fifth minute APGAR score (P=0.051, P=0.002, respectively), and NICU admission (P=0.0001).

Conclusion: Outcome of the study showed that reversed breech extraction method had significantly lower maternal and fetal risks.

Keywords: Maternal Outcome, Fetal Outcome, Reversed, Breech Extraction, Caesarean Section

1. Introduction

Delivery of deeply engaged heads during the caesarean section is really a dilemma for obstetricians. Though it is uncommon in developed countries, we still face a lot of cases of obstructed labor in our region; it is highly prevalent in rural area especially those women who are in labor at home for long time. The Caesarean section is delivery of fetus through surgical incision through abdominal wall (laparotomy) and uterine wall (hysterotomy) **(1)**. It carries risk for both mother and baby. Prolong labor generally and obstructed labor is not properly defined. Obstructed labor happens when there is arresting of progressive descent of fetal presenting part despite strong uterine contraction due to mechanical obstruction and its prevalence varies from country to country **(2)**. Caesarean delivery at full or nearly full dilatation carries risks for both mother and fetus during delivery of deeply engaged head due to inadequate distance between the muscle of uterus and the bony maternal pelvis, caput succedaneum and molding of fetal head **(3)**. Another major contributing factor for maternal morbidity is very thin, edematous lower segment which enhances injury of uterine artery, extension of uterine incision, broad ligament hematoma, increase risk of postpartum hemorrhage, direct trauma to bladder or due to pressure of fetal head **(4)**. Also, fetal morbidity increased in skull injuries, cerebral hemorrhage and neonatal hypoxia that result in higher rate of NICU admission **(3)**. There are different methods for delivery of the fetus during the caesarean section at advanced stages of labor. The conventional method of fetal extraction by lifting the head out of pelvis by the surgeon's hand (head lifting) is often assisted by vaginal dislodge and exerts considerable force on the fetal head **(5, 6)**. The reverse breech extraction method is also described by Patwardhan and Motashaw **(7)**. The present study was conducted with aim to evaluate maternal and fetal outcome in reversed breech extraction vs. head lifting method during caesarean section.

2. Materials and Methods

This prospective case- control study was conducted at obstetrics department of Basrah Maternity and Child hospital, Basrah \ Iraq from January to November 2022. A total of 88 women who met the inclusion criteria were involved in this study. The subjects were randomly divided into two groups: those who delivered by reverse breech extraction approach (group A) and those who delivered by the standard approach (head lifting) (group B). The inclusion criteria were singleton and term pregnancy (>37 weeks of gestation), cephalic presentation, second stage of labour (1 hour for multipara, 2 hours for primipara) who were actively pushing with uterine contraction, required an intrapartum caesarean section at full cervical dilation. Exclusion criteria were multiple pregnancy, fetal anomalies, preterm delivery, fetal malposition, and previous caesarean section. The Caesarean section was performed by on call senior obstetricians. The first tries to deliver the baby was done by conventional head lifting, if the surgeon was unable to deliver the baby then he immediately grasps the fetal legs and perform reverse breech extraction. The head pushing method during caesarean section was performed by lifting the fetal head out of maternal pelvis by surgeon's hand. If the surgeon was not able to lift the head, vaginal dislodgement was done with the help of an assistant's hand. In the Breech extraction method, after uterine incision, fetal arms are extracted, then the surgeon grasps the feet and delivers both legs, sometimes supported by fundal pressure, the fetal head can be easily disengaged from maternal pelvis by unscrewing maneuver.

The demographic and pregnancy related characteristic included age, parity, gestational age, antenatal care which is classified as: booked (who received 7-10 appointment for antenatal care), uncooked (who received less than 4 appointment) while infrequent who received 4-7 appointment. Hemoglobin level before the surgery and mean of operation time from incision of the skin to the closure of the skin were recorded. Maternal indications for caesarean section included: (cephalopelvic disproportion, malposition of fetal head, others). In both groups, maternal outcomes including rupture uterus, extension of uterine incision, uterine artery injury, blabber injury, postpartum hemorrhage: (postpartum blood loss more than 500 ml), postoperative hemoglobin level and blood transfusion and fetal outcomes including birth weight, gender, first and fifth minutes Apgar score, still birth, asphyxia and neonatal intensive care unit (NICU) admission were measured.

3. Results

Mean age of women was 25.93 year for group A and 26.86 year for group B (p=0.413). Also, in group A, 23 patients (52.3%) were primigravida and 2 patients (4.5%) had more than 4 babies, while in group B, 22 patients (50%) were primigravida and 2 patients (4.5%) had more than 4 babies. Moreover, 23 patients (52.3%) in group A and 20 (45.5%) in group B were booked (regular) to antenatal care. There was no significant association between reversed breech extraction group and head lifting group regarding demographic and pregnancy related characteristics. Detailed description of patients' demographic and pregnancy related characteristics were shown in Table 1.

Table 1. Demographic and pregnancy related characteristics

	Group A Breech extraction		Group B Head lifting		P-value
	No	%	No	%	
Age (Mean±SD)	25.93±4.93		26.86±5.67		0.413*
Parity					
0	23	52.3	22	50.0	
1	9	20.5	6	13.6	0.757**
2-4	10	22.7	14	31.8	
≥4	2	4.5	2	4.5	
Gestational age					
37-40	43	97.7	40	90.9	0.360**
≥41	1	2.7	4	9.1	
ANC					
-Booked(regular)	23	52.3	20	45.5	0.667***
-infrequent	15	34.1	15	34.1	
-un-booked	6	13.6	9	20.5	
HB Level at admission	10.52±0.89		10.37±0.79		0.401*

*** T-test ** Fisher's Exact test *** Chi-Square test**

The results of Table 2 showed no significant association between the two groups in relation to the indication of caesarean section. There was no risk of uterus rupture in the two groups. There was significant association between the two groups regarding uterine artery injuries (11.4% in group A vs. 52.3% in group B) (P=0.0001), uterine extension (31.8% in group A vs. 75% in group B) (P=0.0001), blood transfusion (34.1%) in group A vs. 65.9% in cluster B) (P=0.003), mean operation time (42.09 minutes in group A vs. 51.70 minutes in group B) (P=0.0001), mean post-operative hemoglobin level (9.96 mg\dl in group A vs. 9.49 mg\dl in group B) (P=0.026). There was a small risk of bladder injury in group B, but the difference was not significant (P=0.494).

Table 2. Maternal outcomes in reversed breech extraction and head lifting groups

	Group A Breech extraction		Group B Head lifting		P-value
	NO.	%	No.	%	
Indications for C\S:					
-CPD	20	45.5	19	43.2	0.597*
-Malposition	24	54.5	23	52.3	
-Others	0	0.	2	4.5	
Uterus rupture	0	0		0	----------
Uterine artery injuries:					0.0001**
Yes	5	11.4	23	52.3	
No	39	88.6	21	47.7	
Uterine extension:					0.0001**
Yes	14	31.8	33	75.0	
No	30	68.2	11	25.0	
PPH (atony):					
Yes	10	22.7	11	25.0	0.803**
No	34	77.3	33	75.0	
Bladder injuries:					0.494*
Yes	0	0.0	2	4.5	
No	44	100.0	42	95.5	
Blood transfusion:					0.003**
Yes	15	34.1	29	65.9	
No	29	65.9	15	34.1	
Operation time mean(minutes)	42.09±6.20		51.70±11.95		0.0001***
Postoperative HB level	9.96±0.90		9.49±1.05		0.026***

*** Fisher's Exact test ** Chi-Square test *** T-test**

As Table 3 showed, there was significant association between the two groups in relation to birth weight (2 neonate (4.7%) in group A and 9 neonates (21.4%) in group B had birth weight more than 4 kg) (P=0.016). The first minute APGAR score in group A was 5.14 and in group B was 4.43, while 5 minutes APGAR score in group A was 7.77 (P=0.051) and in group B was 6.77 (P=0.002). Early NICU admission occurred in 9 neonates (20.5%) in group A and 29 neonates (65.9%) in group B (P=0.0001).

Table 3. Fetal outcomes in reversed breech extraction and head lifting groups

Fetal outcome	Breech extraction		Head lifting		P-value
	No	%	No	%	
Birth weight:					
- <2.500 kg	0	0.0	1	2.4	0.016*
- 2.500-3.750 kg	41	95.3	32	76.2	
- ≥4 kg	2	4.7	9	21.4	
Gender:					
Male	25	56.8	25	56.8	1.000**
Female	19	43.2	19	43.2	
APGAR score (mean±SD):					
1 minutes	5.14±1.62		4.43±1.71		0.051***
5 minutes	7.77±1.19		6.77±1.69		0.002***
Still birth:					
No	44	100.0	44	100.0	----------
Asphyxia:					
Yes	5	11.4	4	9.1	1.0000*
No	39	88.6	40	90.9	
Admission to NICU:					
Yes	9	20.5	29	65.9	0.0001
No	35	79.5	15	34.1	

*** Fisher's Exact test ** Chi-Square test *** T-test**

4. Discussion

The rising rates of intrapartum caesarean sections, especially at full cervical dilation indicate focusing attention on skilful technique to deliver the fetus **(8)**. This study evaluated maternal and neonatal complications in reversed breech extraction approach for delivery of deeply engaged head during caesarean section and compared it with head lifting method. No statistically significant difference was found between reversed breech (group A) and head lifting (group B) methods regarding mothers' age. The obstructed labor tends to occur in women aged 20-39 years; this finding agrees with the results of Levy et al.'s research **(5)**. Regarding parity also no significant difference was found between the two groups, but obstructed labor tends to occur in nulliparous women rather than multiparous women; this finding is like the result of study Levy et al **(5)**. The cause of obstructed labor in the present study in two groups was fetal malposition and this in disagreement with other studies **(9, 10)**. No maternal death or uterus rupture occurred in the current study. The risk of bladder injury in this study was only two cases in head lifting method that can be related to good obstetrician's experiences, better anesthesia and bladder easily mobilized off the cervix deeply downward during caesarean section which help to protect the bladder when extension occur. It was observed that a reversed breech extraction performed by opening transverse incision in the uterus high to reach into the upper segment for fetal leg and by applying gentle traction on the leg until another leg appeared is associated with lower rate of complications. In the current research, extension of uterine incision and uterine artery injury were significantly lower in the reversed breech extraction group compared to head lifting group and this agrees with the results of study Lenz et al **(11)**. Moreover, in the present study, no significant difference was observed between the two groups regarding postpartum hemorrhage, and this disagrees with the finding of study Nooh et al **(12)**. Other complications caused by extension include operation time (42.09 minutes for reversed breech versus 51.70 minutes for head lifting), need for blood transfusion (15 cases for reversed breech versus 29 cases for head lifting) in the present study agree with other randomized clinical investigations performed in different countries **(12-14)**. Concerning fetal outcome in the present study, it was found that reversed breech extraction was associated with less frequent fetal complications as there was statistically significant difference between the two groups regarding birth weight, first and fifth minute

APGAR score and early admission to NICU that agree with the results of research Barbieri **(15)**.

5. Conclusion

Complication of caesarean section in the second stage of labor is still rising. This study showed that reversed breech extraction was associated with significantly lower risk of extension of uterine incision, uterine artery injury, postoperative hemoglobin level, bladder injury, and operation time. Also, neonatal risk was significantly lower in breech extraction that was in relation to admission to neonatal care unit, first and fifth minute APGAR score and birth weight.

6. Declarations

Acknowledgments

Not applicated.

Ethical Considerations

This study was conducted after obtaining the approval of Basrah University, College of Medicine Review Board (BMCRB No. 1, 2\10\2022).

Authors' Contributions

Ghufran Jaafar Al Sereah: protocol development, data collection and management, data analysis, manuscript writing and editing.

Conflict of Interest

The authors declare no conflict of interest.

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None.

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