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RESEARCH ARTICLE

Study of effect of mode of delivery on maternofoetal outcome among patients of breech delivery: a comparative study

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ABSTRACT

Objective: This study aimed to assess the maternofoetal outcome in term pregnant women with breech presentation delivered vaginally or abdominally and effect of mode of delivery on the developmental milestones of the newborn. The factors that remained determinant in deciding mode of delivery were also analysed in both the groups retrospectively. **Materials & methods**: This study was a cross sectional study conducted over a period of one year in a tertiary care center of rural Haryana. The study group included all the term pregnant women with breech presentation having no obstetrical and medical complications that might affect the milestones development. The study group was divided as, group 1 including all patients delivered by caesarean section and group 2 including all patients delivered vaginally. The outcome measures were intrapartum and postpartum complications, neonatal weight, Apgar score, NICU admission and development of milestones for one year. **Results:** The incidence of breech presentation at term was 7.04%. The rate of LSCS and vaginal delivery was 67.89% and 32.11%. Postpartum complications were noted in 4.13% patients. Most common indication for LSCS was primigravida with breech presentation. The Apgar score at 1 and 5 minutes was comparable in both the groups. 4.58% neonates in group 1 and 7.79% neonates in group 2 were admitted in nursery followed by one neonatal death in group 2 secondary to arrest of aftercoming head. The development of milestones was similar in both the groups. **Conclusion:** The maternal and foetal outcome was similar in both the group, and milestone development were also same in both the groups. Along with parity, foetal weight, the status of amniotic membranes and bishop score also played determining role for mode of delivery.

Keywords: Vaginal breech delivery, deflexed head, developmental milestones, Bishop score.

When a foetus finally keeps his head in fundal region and places podalic pole in lower uterine segment at term, it sparkles a row of debates among the involved obstetrician's team about its further management. In 2000, the Term Breech Trial (TBT) associated significant lower perinatal mortality, neonatal mortality and serious neonatal morbidity in the planned caesarean section arm (1.6%) as compared to the planned vaginal delivery arm (5.0%) [1] and reported an adverse foetal outcome in vaginal breech delivery during pregnancy, labour, delivery and the post-partum period. These adverse events are more frequently encountered among nulliparous [1] and ACOG in 2001 dissuaded the recommendation of vaginal breech delivery raising the rate of LSCS for breech presentation to 86.9% [2]. However the follow up studies of term breech trial (TBT 2000) to address outcome of the born children at 2 years revealed that risk of death or neurodevelopmental delay was indifferent in both the arms [3].

This study paved the path of vaginal breech delivery instead of elective caesarean section in all cases of breech presentation particularly in nulliparous women and ACOG in 2018 recommended a planned vaginal breech delivery in light of hospital specific guidelines [4]. However literature review of recent population based studies highlights that

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foetus that remain persistent in the breech presentation at term are at increased risk compared to foetus in cephalic presentation because of antenatal complications and underlying disorders associated with breech presentation at term[5-7]. Considering mode of delivery, as only deciding factor for milestone development is not justifiable. Underlying gestational disorders like prematurity, IUGR and maternal endocrine disorders also play important role in mental development of new-born [5 - 7]. In our institute option of trial of vaginal delivery is given to term pregnant women with breech presentation with fixed departmental protocols. So we planned this study to assess isolated effect of mode of delivery on developmental milestones of new born. We included only healthy term patients with breech presentation and excluded prematurity, preeclampsia, IUGR etc. In the study population the new born were followed for one year for milestone development.

Aims and objectives: The primary objectives were to study the effect of mode of delivery on development of milestones of new born and compare the maternofoetal outcome in term pregnant women with breech presentation delivered vaginally and abdominally. The secondary objective was to analyse the determining factors for mode of delivery retrospectively.

Materials and methods

It was a cross sectional study conducted in the department of Obstetrics & Gynae BPS at a rural tertiary health care centre for one year. It included all the term breech births from1 July 2018 to 31 June 2019 (after ethical committee clearance). All term breech deliveries conducted abdominally or vaginally during the study period were analysed and the newborns were followed for their milestones development during the first year with the help of department of Paediatrics.

Inclusion criteria: All term singleton pregnant patients with breech presentation reported during one year of study period were included in the study.

Exclusion criteria: Preterm pregnant females, severe IUGR documented with doppler, severe preeclampsia or eclampsia, maternal hypo or hyperthyroidism, twins, foetus with congenital malformations or any maternal condition where foetal neural development can be affected were excluded from the study. After delivery all these women were divided into two groups.

Group1: Included all the pregnant women who underwent lower segment caesarean section for breech delivery.

Group 2: Included all the pregnant women who delivered vaginally.

All the patients who were willing for vaginal breech delivery were assessed for approximate foetal weight and pelvis for feasibility of vaginal delivery. An X-ray of patient abdomen was done to assess the attitude of foetal head, when the angle between cervical vertebrae and cervicothoracic junction is measured and if it is 90 degree or more it is labelled as deflexed head [8]. Women with previous one caesarean section, bad obstetric history, deflexed head, footling presentation and prolonged leaking per vagina resulting in severe oligohydramnios were not considered for trial of labour. The patients were counselled about the anticipated maternofoetal risks as well as benefits of breech delivery and caesarean section. An informed consent regarding the use of patient details for research purpose is included in the hospital record file of every patient. The maternal outcome was assessed by mode of delivery, intrapartum and postpartum complications like haemorrhage, vulvovaginal trauma, bladder injury medical records were analysed. The foetal outcome was assessed by foetal weight, Apgar score at 0 and 5 min, requirement of neonatal resuscitation, NICU admission, and any birth trauma. The newborns were monitored for one year for development of milestones. CDC guidelines were used for milestones assessment including motor, fine motor, personal, social and language development. To study factors that finally decided mode of delivery were analysed by bishop score at the time of admission, status of amniotic membranes, and presenting foetal part.

Statistical analysis: Data of all cases was recorded from case sheets of patients and analysed with Microsoft Excel and SPSS 20. The continuous variables were analysed using descriptive statistics and data presented as percentages. The student t test used for statistical analysis. In categorical data analysis data presented in percentage and chi square test used to calculate p value. A value of less than .05 for p labelled as significant.

Results

Out of total 3264 term deliveries 230 were term breech delivery out of which 218 patients constituted the study group. The incidence of term breech in present study was 7.04%. The mean age of the whole study group was 24.12±04.99 yrs. In the study group 28.44% patients were illiterate, 36.40% patients were unbooked, visited Anganwadi workers only. 68.80% patients were of rural background and the average period of gestation was

38.93±1.20 weeks. The whole study group was divided into two groups on the basis of mode of delivery. Group 1 included 148 patients underwent caesarean section and group 2 included 70 patients underwent vaginal breech delivery. Both groups were statistically analysed and compared in table 1.

Table1: Univariate analysis of both the groups

Characteristics	Group 1 (n=148)	Group 2 (n=70)	P value
Age in years	24.24±5.37	23.87±4.12	0.61
Gravida	1.59±0.92	1.8±0.92	0.12
Parity	0.33±0.64	0.75±0.92	0.00
Period of gestation in weeks	38.95±1.23	38.91±1.15	0.87
Bishop score	3.80±2.35	9.47±3.69	0.00
Baby wt. in Kg	2.74±0.38	2.58±0.33	0.02
Apgar score1	7.06±1.11	7.01±1.33	0.75
Apgar score 5	9.10±0.94	8.95±1.41	0.35
Hospital stay in hours	54.51±21.21	48.88±21.37	0.06

The analysis of table 1 showed that both the groups were statistically different in terms of parity, bishop score, baby weight. The incidence of caesarean section was higher in primigravida women, in cases of poor Bishop score and baby weight more than 2.75kg.

Table 2: Detailed presentation of differentiating features in both the groups

Differentiating factors	Group 1 N(%)	Group 2 N(%)
Parity		
Nulliparous	113(76.35)	35(50)
P1-P3	35(23.65)	34(48.57)
>P3	--	01(01.43)
Bishop score		
<6	126(85.13)	13(18.47)
6-13	22(14.87)	44(62.86)
Fully dilated fully effaced	--	13(18.57)
Status of membranes		
Intact membranes	100(67.56)	37(52.86)
PROM/Ruptured amniotic membranes	48(32.430	33(47.14)
Baby weight		
2.25-2.5kg	46(31.08)	34(48.57)
2.6-3.0kg	73(49.32)	30(42.86)
3.1-3.5kg	26(17.56)	06(08.57)
>3.5kg	03(02.02)	--

Table 3: Outcome of breech delivery

Outcome factors	No. of patients	% of patients
Caesarean delivery	148	67.89%
Indications of LSCS		
Primigravida with breech	76	51.35%
Breech with obstetric indications like BOH (have no endocrine disorders) previous LSCS, contracted pelvis, oligohydramnios (pregnant females with complain of leaking per vagina)	62	41.89%
Breech with deflexed head or footling presentation	10	6.75%
Assisted breech delivery	70	32.11%
Postpartum haemorrhage	05(1pt. in group 1& 4pts. In gp2)	2.29%
Cervical/ vaginal tear	04(all in gp2)	1.84%

The table - 2 shows that in group 1, 76.35% patients were nulliparous and in group 2, they were 50%. All patients with bishop >6 were given trial of vaginal delivery except in patients with previous one LSCS or bad obstetric history. Even 13 patients in group 2 reported in latent labour underwent vaginal delivery during their waiting period for LSCS in view of busy OT. The minimal weight of baby was 2.25 kg and maximal weight was 3.5kg.

Table 4: Neonatal outcome and milestone development

Neonatal resuscitation measures	Group 1 N(%)	Group 2 N(%)	P value
Cried immediately after birth	138(93.24)	53(75.71)	0.00
Resuscitative measures like suction and bag and mask	06(4.05)	09(12.85)	0.00
Intubation and NICU shift	04(2.70)	08(11.42)	
Discharged from NICU alive	10(6.75)	16(22.85)	
Expired in NICU	-	01	0.32
Milestones development for 1 year	Normal in 147 Delayed in one child	Normal in all 69	

Regarding obstetric complications, four patients developed vaginal tear and five patients developed atonic postpartum haemorrhage. In one patient intraoperatively unicornuate uterus was found. Table 3 shows the obstetric outcome of study.

Assisted breech delivery was conducted in 32.11% patients. In 18.94% patients, the foetal head was delivered by Burn Marshall technique while 13.17% patients were delivered by Mauriceau-Smellie-Veit technique. The neonatal outcome in both the groups was analysed in table 4 as shown and one year follow up is also tabulated.

The postnatal morbidity per 100 breech delivery was 4.5% in group 1 and 7.79% in group 2. One neonatal death occurred in group 2 due to a delayed head delivery and resuscitation failure. This patient was unbooked, nulliparous, reported in second stage of labour, baby delivered with manoeuvres. The foetal weight was 3100gm.

Discussion

Breech presentation is defined as a foetus in a longitudinal lie with the buttocks or feet closest to the cervix. The incidence of breech presentation decreases from 20% at 28 weeks gestation to 3-4% at term [9]. In the present study the incidence came out 7.04 % per 100 term delivery. Studies from all corners of India also reported it in 2.1%-4.11% cases [9 - 11]. In our study the incidence was 7.04% comparatively higher inspite of including only term uncomplicated pregnancy. The possible explanation might be higher number of referral cases in a radius of 50-60km to our tertiary care centre due to the anticipated risks associated with breech presentation.

The rate of vaginal delivery and LSCS was 32.11 % and 67.89 % respectively in our study. The rate of vaginal delivery has been reported from 38.9% to 72.1% in various developing nations of the world. In India the reported incidence of vaginal delivery was 42.6%. Literature reports it 55.8% in Pakistan, 54.6% in Cameroon, 42.6% In India, 72.1% in Nigeria and 38.9% in Ethiopia [9]. The low incidence of vaginal delivery in present study was primarily due to two reasons, the first is being a referral tertiary care center we are receiving high risk patients from all over the state. About 49% cases in our study were already having one or the other risk factors which did not allowed us for a trial of vaginal delivery to avoid maternofoetal complications. The second reason is non utilisation of external cephalic version in our institute.

The incidence of adverse maternal outcome in group 2 was 0.09% (4 patients developed PPH and 4 patients developed cervico-vaginal tear. Literature reported incidence varies from 3.6% to 13.2% [12,13]. In group 1 the incidence of PPH was comparatively low (one patient). But definitely in group 1 there was prolonged hospital stay as well as late resumption of routine activity by patient compared to group 2.

In present study the incidence of adverse perinatal outcome7.79% in group 2 and 4.58% in group 1, studies reports it upto 23.8% in vaginal breech delivery with perinatal mortality upto 8.3% [12]. The perinatal morbidity in vaginal breech delivery is 2 to 5 fold higher compared to caesarean section. Studies also highlighted 13.3 times higher odds ratio for Apgar <7 at 5min compared to LSCS group [12,13]. In present study also initially the perinatal morbidity was almost double in group 2 compared to group 1 but long term outcome was same. The perinatal mortality in present study was only one in vaginal delivery group due to delayed delivery of foetal head and resuscitation failure. A low incidence might be due to a more conservative approach and inclusion of term pregnancy in the study as prematurity might increase the perinatal morbidity and mortality.

In the present study, the factors that determined mode of delivery in breech presentation were parity status of patient, foetal weight and bishop score of patients at the time of admission. Literature has reported positive correlation between rate of complications and nulliparity [1,4,14]. That's why caesarean section is preferred over the vaginal delivery in nulliparous patients. In present study also 51.35% caesarean section were done for primigravida with breech presentation, however 50% patients delivered vaginally were also nulliparous. For estimated foetal weight, the literature gives a broad range from 2.5-4.0 kg [4,15,16]. In present study, the maximum weight delivered vaginally was 3.2 kg.

In our study patients with bishop score seven or more with no other high risk factors delivered vaginally. We could not get any study reporting a correlation of the Bishop score with mode of delivery but in our study almost all the nulliparous women who delivered vaginally reported in active stage of labour or second stage of labour. A few reported in latent phase and progressed well during their waiting period of LSCS. However all the nulliparous women who reported without labour pains underwent LSCS. Besides, the status of membranes and attitude of foetal head also affects decision process [17]. As the absent membranes increases the incidence of cord prolapse and a state of oligohydraminos results in failed vaginal delivery [8,18]. According to literature deflexed foetal head predispose for arrest of after coming foetal head [8,18]. In present study also patients with leaking per vagina with poor Bishop and deflexed foetal head were not considered for trial of vaginal delivery inspite of multiparity. Varying with different protocols for vaginal breech delivery in present study we found Bishop score >6 with intact membranes might be used as a good predictor of vaginal breech delivery.

The factors we associated with mode of delivery have no bearing with development of milestones. The time has come to broad our thinking in understanding the milestone development in pregnancy with breech presentation. Bjellmo et al in their study showed that singleton children born at term without congenital malformations had a higher risk for stillbirth and neonatal mortality if they were born in the breech presentation regardless of mode of delivery compared with those born by vaginal cephalic delivery (3/10001) [19]. These authors consolidated with their study that foetuses with antenatal acquired risk factors for adverse outcomes are more likely to present in the breech than in the cephalic presentation at birth. Studies evaluated antenatal risk factors associated with adverse perinatal outcomes in planned vaginal breech labour at term and found that stillbirth rate was significantly higher in cases of planned vaginal breech labour than in cases of cephalic presentation (0.2 to 0.3). This outcome was in correlation with foetal growth restriction, oligohydramnios, gestational diabetes mellitus and a history of caesarean section [5,6,7,19]. Beyond doubt these factors on one side predisposes patient to poor antenatal growth of foetus and on other side also increases the risk of operative delivery. In the present study we excluded all these factors and concentrated mainly on factors affecting mode of delivery and effect of mode of delivery on milestone development. All the neonates in present study irrespective of mode of delivery developed normally. There was no developmental delay in the neonates who underwent resuscitation process or admitted in nursery. Even the term breech trial follow up study showed no difference in the mental development of planned caesarean delivery and planned vaginal delivery. Children with serious neonatal morbidity survived well and developed normally the reason may be lack of antenatal obstetrical and medical complications in both the groups.

The successful external cephalic version (ECV) has reduced the risk of cesarean delivery by approximately 40% as reported by Hofmeyr et al [20] and in present study considered as a cause for high incidence of LSCS. But ECV itself has lot of limitations one is technical competency of the obstetrician as well as institute and second is big list of contraindications and prerequisites of ECV [5]. A large study in Australia over 32,321singleton breech pregnancy 22.3% were considered ineligible for ECV (in view of oligo-hydraminos, APH, prev LSCS, abnormal pelvis) only 10.5% of singleton breech pregnancy had ECV [5, 21].

The review of literature and present study strongly suggests that antenatal and underlying disorders that may be associated with persistent term breech presentation may result in adverse outcomes among foetus and any discussion limited to only mode of delivery don't address the whole issue.

Limitations of this study: In the present study we used X-ray instead of ultrasound to determine foetal attitude an older modality in view of limited facilities, lack of ECV.

Conclusion

With this study we found average foetal weight and good bishop score in term breech presentation patients may favour vaginal delivery and milestones development usually remains unaffected in both modes until severe asphyxiating episode happens. However ECV should be included in management plan and residents as well as faculty members should be trained.

The uniqueness of our study lie in the fact we took all normal pregnant females with breech presentation and excluded prematurity, IUGR and other obstetric and medical complications. Second is we highlighted that good Bishop score with presence of amniotic membranes at time of presentation may be considered as a good predictor for vaginal delivery. Besides we did prolonged follow up of children of both the groups for one year by their milestones development.

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