

Early Neonatal Outcomes of Term Breech Delivery

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Abstract

Objective: To evaluate early neonatal outcomes of term breech deliveries according to the mode of delivery.

Methods: Term (≥ 37 weeks gestation) singleton breech deliveries between January 1 2003 and December 31 2004 were reviewed retrospectively. Neonatal mortality, 1 and 5 minutes Apgar scores, neonatal birth trauma, neonatal convulsions, and neonatal care unit admission were compared due to the mode of delivery.

Results: : 41128 deliveries occurred in our hospital between January 2003 – December 2004. 986 (2.39%) of them were term breech deliveries. 172 (17.4%) and 814 (82.6%) were delivered by vaginally and cesarian section, respectively. In the vaginal route group, 3 (1.7%) neonatal deaths were observed while no deaths was observed in the cesarian group ($p=0.0001$). 5 minute Apgar score of < 4 were observed 4 (2.3%) cases in the vaginal deliveries and no cases were observed in the cesarian delivery group ($p=0.0001$). Birth trauma was seen 7 (0.7%) newborns. 6 (3.5%) and 1 (0.1%) cases were delivered vaginally and cesarian section, respectively. ($p=0.0001$). 15 (1.5%) of them were admitted to the neonatal intensive care unit. Of those, 7 (4.1%) were delivered vaginally, 8 (1.0%) were delivered by cesarean section ($p=0.008$).

Conclusion: Term vaginal breech delivery is associated with increased mortality and morbidity in early neonatal period when compared with cesarean delivery.

Keywords: Breech presentation, route of delivery, neonatal outcomes.

Miadında makat doğumlarda erken neonatal sonuçlar

Amaç: Miadında makat doğumların, doğum şekline göre erken neonatal sonuçlarını değerlendirmek.

Yöntem: 1 Ocak 2003 – 31 Aralık 2004 tarihleri arasında doğum yapan miadında (≥ 37 gebelik haftası), tekil makat doğumlar retrospektif olarak değerlendirildi. Doğum şekline göre, neonatal mortalite, 1. ve 5. dakika Apgar skorları, yenidoğan doğum travması, yenidoğan konvülsiyonu ve yenidoğan yoğun bakım ünitesi ihtiyacı bulunup bulunmamasına göre değerlendirildi.

Bulgular: Ocak 2003 – Aralık 2004 tarihleri arasında hastanemizde toplam 41128 doğum gerçekleştirildi. Bu doğumların, toplam 986 tanesi (%2.39) miadında makat doğumdu. Doğumların, 172 tanesi (%17.4) vaginal yoldan ve 814 tanesi (%82.6) sezaryen ile gerçekleşmişti. Doğum şekline göre yenidoğanlar neonatal ölüm oranları açısından karşılaştırıldığında, doğumun vaginal yoldan gerçekleştiği olguların 3 (%1.7) tanesinde neonatal ölüm meydana gelirken, sezaryen ile doğumun gerçekleştiği grupta neonatal ölüm izlenmedi ($p= 0.0001$). 5. dakika Apgar skoru vaginal doğumun gerçekleştiği 4 (%2.3) olguda <4 olarak tespit edildi ve sezaryen ile doğumun gerçekleştiği grupta Apgar skoru < 4 olan olguya rastlanmadı ($p=0.0001$). Toplam 7 (%0.7) yenidoğanda doğum travmasına rastlandı, 6 (%3.5) olgu vaginal yoldan, 1(%0.1) olgu sezaryen ile doğmuştu ($p=0.0001$). Yenidoğan yoğun bakım ünitesine toplam 15 (%1.5) olgu kabul edildi. Bu olguların, 7 (%4.1) tanesi vaginal yoldan, 8 (%1) tanesi ise sezaryen ile doğmuştu ($p=0.008$).

Sonuç: Miadında vaginal makat doğum, sezaryen doğum ile karşılaştırıldığında erken neonatal dönemde mortalite ve morbidite artışı ile beraberdir.

Anahtar Sözcükler: Makat prezentasyonu, doğum şekli, neonatal sonuçlar.

Introduction

Breech presentation is met about 3-4% in term deliveries. The aim of modern obstetrics is healthy mother and healthy fetus. Breech deliveries are closely related with concepts such as birth trauma, perinatal asphyxia, newborn death as to cephalic deliveries. It is thought for a long time that vaginal breech deliveries increase the mortality and morbidity of newborn when compared with cesarean delivery.

Delivery type which should be chosen in breech presentation is still a problem discussed on today. Disputes on this subject have increased in recent years and controversial results are mentioned in published retrospective works.¹⁻⁶ Debates about the administration of breech delivery complicate prospective works. To decide whether the delivery will be performed in vaginal or abdominal way by physician is so important after finding fetal and maternal situations (such as uterine anomaly, fetal anomaly, multiple gestation, premature, uterine myoma, placenta praevia etc.) creating tendency for breech presentation in a pregnant applied for breech presentation. Birth of a healthy baby from a healthy mother without complication is up to determine risk factors causing breech presentation, to act tenderer and more energetic in administration and inspection as to cephalic presentation by delivery physician.

This study is performed to get answers and to find solutions by the help of literature together with a general view for breech deliveries and to determine deliveries performed in Ministry of Health Istanbul Bakırköy Training and Research Hospital for Gynecology, Obstetrics and Pediatrics and thus to give a viewpoint and hint to physician in delivery approach in which maternal and fetal mortality and morbidity may be reduced.

Methods

Cases which were found term ($\geq 37^{\text{th}}$ gestational week) single breech presentation within pregnant applied to Ministry of Health Istanbul Bakırköy Training and Research Hospital for Gynecology, Obstetrics and Pediatrics in between

1st January 2003 – 31st December 2004 were reviewed retrospectively. Perinatal results were compared as to birth type (vaginal or abdominal way). The study was planned as retrospective cohort study.

Cases which were applied to emergency polyclinic of our hospital and which were taken to maternity ward by deciding elective cesarean after finding breech presentation in term in the antenatal examinations were determined by being applied detailed anamnesis and physical examination, non-stress test, fetal ultrasonography, hemogram and blood type surveys. As to examinations;

- term and,
- single gestation cases
- at 37th gestational weeks and above were included to the study.

In early period ultrasonographies in term determination or ultrasonographies done in maternity ward in cases that did not know or not sure last menstrual period date, those who were proved that approximate fetal weight was more than 2500 gr were deemed as term.

After clinically pelvimetric determination of cases, it was found that regular vaginal examination was done for cervical maturation and dilatation investigating, and fetal cardiotocography was done for determining fetal healthiness to cases which were decided to deliver in vaginal way. Induction and amnions sac were waited to be opened spontaneously by oxytocin in appropriate cases. It was found that all newborns were done Bracht maneuver before all breech delivery maneuvers during vaginal delivery and if this maneuver was not worked, the delivery was performed by Mauriceau-Veit-Smellie maneuver after saving arms by using one of the arm saving maneuvers (classic, Lovset or Muler maneuver as to the preference of physician of delivery).

1 gr cefazolin sodium and antibiotic prophylaxis and non – stress test for determining fetal healthiness were applied to all cases which were decided abdominal delivery. Pfannenstiel and lower uterine segment transverse incision were applied

under general anesthesia to all cases which were performed cesarean.

Obstetrics and gynecology expert and assistant, pediatrician, anesthetist, midwife and newborn nurse were ready in delivery team during delivery in cases of vaginal birth.

All newborns born by cesarean or vaginal way were determined by physical examination by Children Health and Illness physician after delivery.

While determining cases to be included into the study groups, cases having following situations were excluded from the study;

- < 37th week pregnant
- Maternal systemic illness exist
- Multiple gestation
- Antenatal fetal death
- Major fetal congenital malformations (central nervous system anomalies such as spina bifida, meningomyelocele, exencephaly, anencephaly, hydrocephaly and microcephaly; major malformations such as intestinal atresia and congenital heart defect)
- Gestation and hypertensive illness (preeclampsia, eclampsia, gestational hypertension and chronic hypertension)
- Gestation and diabetes mellitus
- Intrauterine growth retardation.

All newborns delivered by vaginal way or cesarean were checked if followings were existed;

- Perinatal mortality
- Being < 7 of first minute APGAR score
- Being < 4 of fifth minute APGAR score
- Neonatal trauma
- Early neonatal convulsion
- Newborn intensive care requirement.

Neonatal death was defined as intrapartum death or death within one week after delivery.

Neonatal trauma was determined as intracerebral bleeding, cephalic trauma, cephalic haematoma, facial nervous clavicle, humerus or femur fracture and other traumas.

SPSS (Statistical Package for Social Science) for Windows 10.0 was used for statistics. Pearson – χ^2 , Fisher absolute test and t test for average of two independent groups were also used for comparing data together with complementary statistical methods (average, standard deviation) in order to determine study data. Statistical significance value p was accepted as < 0.05.

Results

Totally 41128 deliveries occurred in our hospital between January 2003-December 2004. Totally 986 (2.39%) cases appropriate to study criteria were included into the study. Within cases included into the study, 172 cases (17.4%) were delivered by vaginal way and 814 cases (82.6%) were delivered by cesarean. There was statistically no significance between cases delivered by vaginally or by cesarean in terms of gestational week and newborn birth weight ($p=0.525$, $p=0.113$); but as expected, age and parity was significantly low in group delivered by cesarean ($p=0.001$, $p=0.0001$). Nulliparity of vaginally delivered group was significantly lower than group delivered by cesarean ($p=0.0001$) (Table 1).

When comparing groups delivered by vaginally or cesarean as to being < 7 of first minute APGAR score; 1st minute APGAR score < 7 was found in 22 cases (12.8%) of vaginally delivered group and in 81 cases (10%) of group delivered by cesarean. Statistically no significance was found between two case groups ($p=0.273$).

Table 1. Demographic qualities of case groups delivered by vaginal way or cesarean.

| | Breech vaginal delivery (n=172) | Breech cesarean delivery (n=814) | p |
|------------------|------------------------------------|-------------------------------------|--------|
| Age | 28.62 ± 5.07 | 27.30 ± 4.58 | 0.001 |
| Gestational week | 39.03 ± 1.59 | 38.95 ± 1.59 | 0.525 |
| Parity | 1 (0 – 10) | 0 (0 – 6) | 0.0001 |
| Nulliparite | 9 (% 5.2) | 553 (%67.9) | 0.0001 |
| Birth weight (g) | 3045.7 ± 453.1 | 3110.8 ± 497.3 | 0.113 |

Even though no newborn having APGAR score < 4 was found in case group delivered by cesarean when comparing 5th minute APGAR scores of newborns born by vaginally and by cesarean, it was found that 4 (2.3%) newborns in newborn group born by vaginally had 5th minute APGAR score < 4 . There was statistically a significant difference between two case groups ($p=0.0001$).

Totally 7 (0.7%) birth traumas were found in both case groups. 6 birth traumas (3.5%) in vaginally delivered group and 1 birth trauma (0.1%) in group delivered by cesarean were met. Here are the birth traumas we met in both case groups;

- Brachial plexus damage at left arm
- Cerebellar haematoma
- Genital trauma in 2 cases (scrotal incision and scrotal haematoma)
- Haematoma at neck
- Diaphragmatic eventration
- Incision at lower extremity (in group born by cesarean)

When groups delivered by vaginally and cesarean were compared in terms of newborn trauma during delivery; newborn trauma was significantly high in case group delivered vaginally as to case group delivered by cesarean ($p=0.0001$).

When comparing case groups born by vaginally or cesarean in terms of newborn convulsion; convulsion occurred in 1 case (0.1%) in vaginally born group, no newborn convulsion was found in cesarean group. The difference between both groups were not found as significant ($p=0.30$).

Totally 3 (0.3%) cases died in perinatal period.

These were in vaginal delivery group. Here are the death reasons of them;

1st case: It was born 3400 gr and died due to heavy perinatal asphyxia and intracranial bleeding on postpartum third day.

2nd case: It was born 2500 gr and died due to birth trauma and perinatal asphyxia on postpartum fifth day.

3rd case: It was born 2500 gr and died due to perinatal asphyxia on postpartum third day

No risk factor was found for these 3 cases in antenatal period examinations. The difference between both case groups was statistically found significant when they were compared in terms of newborn loss in perinatal period ($p=0.0001$).

7 cases (4.1%) from vaginal delivery group and 8 cases (1%) from cesarean delivery group were taken into newborn care unit when both groups were compared in terms of newborn intensive care unit. All of 7 newborns from vaginal delivery group were put in newborn unit due to birth trauma and asphyxiated birth. 4 of 8 cases from cesarean group which required newborn care unit were put in newborn unit due to dyspnea and 4 of them were put in newborn unit due to newborn sepsis diagnosis. The difference between both case groups was statistically found significant ($p=0.008$) (Table 2).

Discussion

Reducing birth trauma and perinatal asphyxia are within the most important purposes of delivery

Table 2. Newborn results as to birth type of term breech deliveries.

| | Breech vaginal delivery (n=172) | Breech cesarean delivery (n=814) | p |
|------------------------------|------------------------------------|-------------------------------------|--------|
| 1st min. APGAR < 7 | 22 (%12.8) | 81 (%10.0) | 0.273 |
| 5th min. APGAR < 4 | 4 (%2.3) | 0 | 0.0001 |
| Birth trauma | 6 (%3.5) | 1 (%0.1) | 0.0001 |
| Newborn convulsion | 1 (%0.6) | 0 | 0.30 |
| Perinatal death | 3 (%1.7) | 0 | 0.0001 |
| Requirement for newborn unit | 7 (%4.1) | 8 (%1.0) | 0.008 |

medicine developing centuries. It has been thought for long times that vaginal breech delivery increases neonatal mortality and morbidity when compared with cesarean. This observation becomes a debate for last years and being retrospective of studies in this subject increased the debates.¹⁻⁶ Debates on breech delivery administration complicate randomized prospective studies and there are 3 randomized controlled studies comparing neonatal outcomes. First two studies published about 20 years ago and it was reported in these two studies that vaginal breech delivery cause minimal risk increase at properly chosen cases.⁷⁻⁹ Hannah et al compared planned cesarean with vaginal breech delivery in cases with breech presentation in a big and multi-centered, prospective, randomized controlled study and they found that neonatal mortality and morbidity was lower in planned cesarean case group as to vaginal delivery group.⁹ American and British Obstetrics and Gynecology Societies suggested planned cesarean in term, single breech presentation cases after this study.^{10,11}

Brenner et al stated that mortality rate was 25% in 1016 breech delivery and the mortality rate was 2.6% in non-breech deliveries and that antepartum, intrapartum and neonatal deaths in all phases of gestation was significantly high.¹

Tank et al saw that the most frequently seen damages were brain, spinal cord, adrenal glands and spleen in autopsy when they determined the outcomes of traumatic vaginal delivery.¹²

In an analysis performed in Netherlands in 57.819 cases, Schutte et al found that perinatal mortality was high in breech presentations even after correcting gestational age, congenital defects and birth weight.¹³

Krebs et al reported that cerebral palsy in fetuses with breech presentation had no relation with birth type; thus, medical intervention could not be successful for reducing perinatal mortality related with breech presentation.¹⁴ This concept was expanded by Nelson and Ellenberg, they found non-cerebral malformation in 1/3 of children born by breech presentation and having cerebral palsy.

Flanagan et al found 1st minute Apgar scores of newborns which were breech presentation and born by vaginally were lower than those born by elective cesarean; but they could not find any increase in mortality and morbidity.¹⁶

Cheng and Hannah made a systematic research in world literature about term breech deliveries and they found 82 studies in literature published within 1966-1992 and they chose 24 of them for analysis. When they compared perinatal results between planned cesarean breech delivery and vaginal breech delivery, they observed that all death cases were in group delivered vaginally and all neonatal and morbidity occurred after trauma increased in vaginal delivery groups. They suggested preferring cesarean delivery for persistent breech presentation in term until a good planned randomized study having enough statistical power is performed.¹⁷ Similarly, Gifford et al performed meta analysis of term breech delivery outcomes and these analyzes showed that trauma and asphyxia increased in vaginal delivery.¹⁸

In their study which was performed on 1433 pregnant, Pradhan et al compared planned cesarean birth at babies having breech presentation in term with cesarean birth at vaginal and labor in terms of perinatal mortality and morbidity; they found that 5th minute Apgar scores were statistically higher in planned cesarean group and newborn care unit requirement was lower in this group but they found that there was no significant difference between groups in terms of neonatal convulsion and birth trauma and they saw that 3 newborn death cases occurred in group delivered by vaginal and cesarean at labor. No significant difference was observed between groups in terms of special care at cerebral palsy and childhood periods.¹⁹

Gilbert et al evaluated 4952 vaginally delivered cases, 35297 cases delivered by cesarean at labor and 60418 cases delivered by elective cesarean which were totally 100667 cases delivered by breech presentation in term within 3.2 million cases and they found increased mortality and morbidity (asphyxia, brachial plexus injury, birth trauma).

ma) in nullipara vaginal delivery as to cesarean before labor. They could not find difference for neonatal mortality between multipara group delivered by vaginally and group delivered by elective cesarean, but they found that morbidity (asphyxia, brachial plexus injury, birth trauma) increased in multipara group delivered vaginally.²⁰

As a result of well-planned prospective randomized controlled 3 studies including 2396 cases at Cochrane Library Database, perinatal and neonatal deaths, heavy neonatal morbidity were found significant in pregnant with breech presentation being done planned cesarean in term.²¹

We could not find any difference between vaginal and cesarean breech deliveries in terms of first minute Apgar scores in our study; but when we looked to fifth minute Apgar scores which are more precious for determining perinatal asphyxia, we found that fifth minute Apgar score was significantly lower in vaginally delivered group ($p=0.0001$).

Birth trauma was quite high in vaginally delivered group ($p=0.0001$). We found complications such as diaphragmatic eventration (related with phrenic nerve palsy) and scrotal incision together with most frequently seen traumas in literature such as brain, spinal cord and genital trauma. Highness of newborn trauma in vaginal breech deliveries was compatible with the literature.

There was no significant difference between groups in terms of neonatal convulsion ($p=0.30$). Only convulsion was observed in newborn which was born vaginally and found diaphragm eventration and died postpartum fifth day in our study.

While early neonatal mortality was seen in 3 newborns in case group delivered vaginally, it was not observed in any case in case group delivered by cesarean and the difference between them was found significant ($p=0.0001$). This diagnosis was compatible with literature.

When groups were compared in terms of newborn care unit requirement, we found that requirement was significantly higher in vaginally delivered group ($p=0.008$). While 7 cases from vaginal delivery group were put in newborn unit due to birth trauma and asphyxiated birth; none of 8

cases was not related with trauma from cesarean group which was put in newborn unit. 4 of them were put in newborn unit due to dyspnea and 4 of them were put in newborn unit due to newborn sepsis diagnosis.

There are prospective studies which reported that fetus at breech presentation in term can be safely delivered by vaginal way providing to chose case well.^{8,22-26} But legal regulations of countries changing in last years constrained physicians to consider vaginal breech delivery matter. Increased perinatal mortalities and morbidities which were found in groups delivered by vaginally brought tendency of cesarean delivery for fetuses in all breech presentation in term. Today, anesthesia, sterilization, operating room conditions and operator experience for developing cesarean decreased cesarean morbidity in terms of maternal state. This condition is one of the important reasons of increasing cesarean rates. External cephalic version seems as a good alternative for reducing this increased cesarean rates²⁷ and it may be a good option for developing countries like our country. But our knowledge is sufficient for now and more randomized controlled studies are needed.

Though insufficiency of current scientific data, it is thought that elective cesarean is safer for newborn as a result of studies published in recent years and of our study even though there is no consensus about the matter. We found in our study that asphyxia, newborn intensive care requirement, newborn trauma and neonatal death were significantly high in group delivered vaginally.

Conclusion

More prospective, randomized, controlled studies are needed for standardization of birth types found breech presentation in terms of mother and fetus health but it seems that it is hard to execute such studies in today's judicial conditions.

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