



Maternal and Perinatal outcomes in term singleton malpresentations

Dr.Mamata Soren

Associate Professor, Department of Obstetrics and Gynaecology, VSSIMSAR, Burla; Sambalpur

Dr. Sudhanshu Sekhar Nath

Senior Resident, Department of Obstetrics and Gynaecology, VSSIMSAR, Burla; Sambalpur

Dr. Sangeeta Mishra

Junior Resident, Department of Obstetrics and Gynaecology, VSSIMSAR, Burla; Sambalpur

ABSTRACT**Introduction:**

Malpresentation creates a mechanical problem in the delivery of fetus and thus associated with increased frequency of perinatal mortality and morbidity due to prematurity, congenital anomalies and birth trauma or asphyxia. Caesarean sections done to reduce these are associated with impaired maternal outcome, increased risks of uterine rupture, placenta previa and placenta increta in subsequent pregnancies. These observations are true in developing countries where poverty, lack of education, inadequate health resources and no antenatal follow-ups are main problems. Keeping in view the above facts, maternal outcome study is also necessary to determine a proper delivery plan so that the complication can be reduced.

Aims and Objectives:

To find out the maternal & perinatal outcome in term singleton malpresentations and relationship of vaginal & CS deliveries in such cases.

Materials and Method:

This prospective observational study carried out in the Department of Obstetrics & Gynecology, V.S.S. Medical College, Burla included all 171 consecutive term singleton malpresentations and their deliveries during a 20 month period, from Feb 2013 to October 2014 and analyzed in detail.

Results:

We found 38.84% cases of breech, 63.6% cases of face were delivered vaginally whereas all cases of brow, shoulder, elbow and hand prolapse including 61.2% of breech and 36.4% of face presentation were delivered through CS. Overall perinatal mortality was 11.69% and total neonatal mortality was 2.34%.

Conclusion:

The policy of wholesome elective Caesarean Section for term singleton breech is contradicted because of its likely effect in maternal morbidity and no significant difference in perinatal outcome was observed. Offering a trial of vaginal delivery in breech & other malpresentation where the condition favors, to well counseled strictly selected patients remains an appropriate option.

KEYWORDS :**Introduction:**

The optimal management of any malpresentation at term remains a lively debating issue. There have been no prospective randomized trials of sufficient size to resolve this issue except few studies on term singleton breech. In the absence of such information, obstetricians have to rely on presumptions and assumptions. Even though many studies are available on breech presentation are also posing risk to mother and fetus which is an increased concern for patient as well as to health community.

The definitive etiology for malpresentations is not known in majority of cases. They may be associated with contracted pelvis, large baby, polyhydramnios, multiple pregnancy, low lying placenta, preterm labour, anomalies of fetus (neck tumours), or uterus (congenital acquired, e.g. lower segment fibroids).

The management of term breech is highly controversial and varies among different institutions and even among different clinicians in the same institution. The decision to perform cesarean delivery is often based on personal experience or a fear of litigation. Regarding other malpresentations especially in brow and face, brow is associated with high mortality and morbidity of both mother & fetus. The presentation may correct itself in labour by flexion and present as a vertex and undergo further extension and present as a face and may result in vaginal delivery.

Persistence of brow presentation in labour room at term is not compatible with vaginal delivery and necessitates a CS and time allowed to see whether flexion or extension would take place. Failure to progress in next few hours in labour with the persistence of brow presentation is an indication for CS and not for augmentation of labour with oxytocin.

The general causes for malpresentations apply for face presentation. There is a small chance of congenital abnormality such as anencephaly or thyroid goitre and this need to be excluded by an ultrasound examination. In the majority it is due to extension of the head in a normal fetus. An early transition stage in face presentations, it is recognized as a state of unstable equilibrium, and it is difficult to see how it can become persistent. Even with favorable mento-lateral or anterior position if there is failure to progress the safer option for the fetus is CS in the first stage. Majority of face are delivered by vaginally but still controversy remains if associated with any other disease or its risk factor.

Perinatal mortality is increased 2-4 fold with breech presentation, regardless of the mode of delivery. Deaths are most often associated with malformations, prematurity, and intrauterine fetal demise. (Confinio et al 1985) The risk of perinatal mortality associated with vaginal breech delivery may be 2-5 times higher than planned caesarean section. It is estimated that perinatal mortality for breech presentation at term is about 4-5% for vaginal delivery and 2-4% for caesarean section. The higher perinatal mortality and morbidity associated with breech presentation is due principally to prematurity, congenital malformation, birth asphyxia and trauma. Yet no data are available regarding other malpresentation in terms of fetal outcome.

These problems and outcomes in different malpresentation are not adequately addressed in previous studies. We examined the neonatal mortality and early morbidity associated with vaginal delivery of fetuses at term in a tertiary care hospital of western Odisha over the period of 20 months and tried to find out the occurrence of different outcomes in terms of different modes of delivery, parity age and with respect to different malpresentation.

AIMS AND OBJECTIVES:

Primary objective- To find out the maternal & perinatal outcome in term singleton malpresentation.

Secondary objectives- To study the distribution of different term singleton malpresentations, age, parity and relationship of vaginal & CS deliveries in such cases.

MATERIALS AND METHODS:

The study was carried out in the Department of Obstetrics & Gynaecology, V.S.S. Medical College, Burla. The study design was a prospective observational study of all consecutive term singleton malpresentation and their deliveries during a 20 month period, where 171 consecutive malpresentation deliveries were included. All singleton term pregnancies having malpresentation (booked/unbooked) were recruited from Feb 2013 to October 2014 and analyzed in detail.

Cases with multiple pregnancy, Pre-term (< 37 weeks) and Post term (> 42 weeks gestation), Previous Caesarean section, Intra-uterine growth retardation, Pre-eclampsia, eclampsia and other obstetric & medical complications were excluded from the study.

METHODS:

Detailed history taking Detailed clinical examinations-General, Systemic and Obstetrical examination Pelvic examination All the necessary investigations Establishing management protocol.

All necessary investigations were repeated as and when required. Analysis of management protocol. Maternal and fetal outcome studied. Data collected was analysed.

RESULTS:

All term singleton pregnancies were taken out of which 171 were recruited (booked / unbooked) and followed up in the period under study. Patients with age group 21-25 yr represent the highest (51.4%) occurrence of malpresentation followed by the age group 26-30 yrs (22.3%) and the primigravida group having highest (50.87%) occurrence of malpresentation followed by para 1(28%) Almost all type of malpresentation was encountered amongst which the breech presentation was the highest (81.28%).

TABLE-1: TYPE OF MALPRESENTATION

Malpresentation	Number	Percentage
BREECH	139	81.28
Frank	82	47.9
Complete	52	30.4
Footling	5	2.92
FACE	11	6.43
BROW	4	2.33
SHOULDER	9	5.263
ELBOW & HAND PROLAPSE	4	2.33
COMPOUND	4	2.33

Overall, 62 (36.25 %) women delivered vaginally & CS was done in 109 cases out of which planned cesarean section was done in 51 (29.82 %) & emergency CS was done in 58(33.92%).

Out of all breech deliveries, 38.3 % have undergone vaginal delivery, 47% have undergone planned CS & 38% undergone emergency CS. Out of all face deliveries, 36.4% have undergone vaginal delivery & no emergency CS was done. Elbow & hand prolapsed presentation have undergone 100% CS. table-4

TABLE-2 INCIDENCE OF PERINATAL MORTALITY IN TERM SINGLETON MALPRESENTATION(N%)

N=171	BREECH (139)	FACE (11)	BROW (4)	SHOULDER (9)	HAND (4)	Total (171)
Still Birth	7.91(11)	18.2 (2)	25(1)	11.11(1)	25(1)	9.35(16)
Neonatal death	1.43(2)	0	25(1)	0	25(1)	2.39(4)
Perinatal mortality	9.35(13)	18.2(2)	50(2)	11.1(1)	50(2)	11.69(20)
Corrected perinatal mortality	2.87(4)	0	50(2)	0	25(1)	4.09(7)

Perinatal mortality was 11.6% out of all malpresentations and the

neonatal mortality rate was only 2.34%. Among the different malpresentation groups, 100% brow, 75% elbow and hand prolapse, 33.4% shoulder, 18.2% of face, 15.18% of breech presentation were having low APGAR at 1min; whereas 75% brow, 50 % hand prolapse with only 4.3% of breech presentation presented a low APGAR at 5min. (Table-7) Perinatal mortality was highest (50%) in brow presentation, least (2.87%) with breech and was not observed in face and shoulder presentation. In this study, we observed out of all vaginal deliveries 19.35 % (RR=2.09 CI-(0.95-4.64) P=0.067) lead to low APGAR at 1min in case of breech and 3.23%(3.12 CI=0.18-52.6, P=0.428) in face deliveries. Only 3.23% cases of vaginal deliveries lead to low APGAR at 5 min and in our study it was observed in breech presentation. We found corrected perinatal mortality of only 3.22% (RR=0.787, p=0.77) out of all vaginally delivered patients. Neonatal mortality is only 1.61% out of all vaginal deliveries.

TABLE-3: PERINATAL OUTCOMES OF TERM SINGLETON MALPRESENTATION IN CAESAREAN DELIVERIES

CS delivery n=109	Breech	Face	Brow	Shoulder	Elbow & hand prolapse
APGAR (1min) <7	8.25	0	2.88	2.75	2.75
APGAR (5min) <7	3.7	0	2.75	0.92	1.84
Corrected Perinatal Mortality 4.58 %(5)	1.83(2)	0	1.83(2)	0	0.91(1)
Neonatal Mortality	0.92		0.92		0.92

Out of all the Caesarean deliveries 8.25%, 2.88% & 2.75% cases are from breech, brow and shoulder presentations respectively had low Apgar scores (Table-9). Highest occurrence of low APGAR at 5 min are from breech deliveries out of all CS. There is a perinatal mortality of 4.58% out of all CS deliveries and 1.83% each from breech and brow presentation.

TABLE-4: PERINATAL OUTCOMES IN TERM SINGLETON BREECH DELIVERIES

	VAGINAL (N=54)	CAESARIAN SECTION (N=85)
APGAR (1min) <7	22.23 (12)	10.5 (9)
APGAR (5min) <7	3.7 (2)	4.7 (4)
Soft tissue damage	0.06(3)	0.02(2)

Table-5: RELATIVE RISK OF VAGINAL DELIVERIES IN COMPARISON TO CS IN ALL TERM SINGLETON MALPRESENTATION

	Relative risk	CI	P value
APGAR (1min) <7	2.344	1.046-5.24	0.0383
APGAR (5min) <7	0.879	0.16-4.66	0.8796

So in this context it can be said that vaginally delivery may have a significant risk for low APGAR at 1 min but in low APGAR at 5 min it can't be said specifically that the vaginal delivery has a risk. Also with regards to very low APGAR score there is no significant risk. Otherwise the sample is not sufficient to find a risk of vaginal deliveries with CS. (Table-11).

After excluding the congenital anomalies and complicating IUD, the corrected perinatal mortality in the vaginal delivery versus the cesarean section was significant (p=0.004), the vaginal delivery group having a corrected perinatal mortality of 3.22% whereas Caesarean group is having 4.85%. (Table-5).

The perinatal outcome that we evaluated in different malpresentation with terms of APGAR score <7 was highest percentage in brow and hand prolapsed (75% & 25 %) respectively as compared to Face (18.2%) & breech (15.1%), Soft tissue damage is highest among face deliveries (27.3%) & more common (4.8%) those who delivered vaginally as compared to CS (1.83%). It is also more common occurrence in multipara group as compared to primi. (Table-14).

Damage to soft tissue was sustained equally but slightly higher in vaginal groups (4.83%). Such damage can be attributed to the fact that delivering the infants even by caesarean section is essentially the process of breech extraction. None of the injuries were life threatening. (Table-12).

When parity is considered as a risk factor then incidence of corrected

perinatal mortality is highest in multipara group(8.6%)as compared to Priimigravida/ nulliparous group(0.99%). In multipara group, perinatal morbidity was significantly higher in terms of APGAR (1min 25.7%, 5min10%) as compared to primigravida/ nulliparous group (12.9% & 3.9% respectively).

We compared the incidence of low birth weight which has a higher incidence in face(27.3%) presentation and breech(23.02%) were highest among all mal presentations. But the incidence of LBW in vaginally delivered group were highest which may not be attributed to any procedural delivery group. But incidence of LBW was highest in primi group (24.4) as compared to multipara(16.7%) (Table-13)

TABLE-6: AGE GROUP AS RISK FACTOR IN TERM SINGLETON MALPRESENTATION

Birth weight	AGE≤20 (n=29)	AGE (21-34) (n=135)	AGE≥35 (n=7)
BW <2500	31.03(9)	20.74(28)	14.28(1)
APGAR (1min) <7	13.7(4)	15.55(21)	14.28(1)
APGAR (5min) <7	3.4(1)	3.7(5)	14.28(1)
Still Birth	6.89(2)	8.9(12)	28.5(2)
Soft tissue damage	3.4(1)	2.96(4)	0

Age group≤20 yrs are most commonly (31%) associated with LBW as compared to 21-34 & ≥35 yr age group (Table-14) . APGAR score at 1 min were found to be highest (15.55%) in 21-34 yr age group, but APGAR at 5 min is highest in ≥35 yr age group.(14.2%). Still birth incidence is highest(28.5%) who delivered at the age of ≥35 yr.

There was no maternal death in either group. Table 15 shows in comparing maternal morbidity PPH was highest among Face (18.2%) Brow (25%). Maternal morbidity in the cesarean section group was 16.5% and in the vaginal group, it was 14.5%.

TABLE-7: INCIDENCE OF MATERNAL COMPLICATIONS IN MODE OF DELIVERY

TABLE-8: STUDIES SHOWING PERINATAL MORTALITY AND MORBIDITY IN BREECH

Sl No.	Authors	Year	No of women	Vaginal		CS		Vaginal		CS	
1	Hannah et al	2000	2083	33.2%	67.8%	-	-	5.0%	1.6%		
2	Giuliani et al.	2002	699	-	-	2.3%	0.5%	-	-		
3	Jukka et al	2003	986	46.1%	53.9%	1.2%	0.5%	-	-		
4	Bassaw et al	2004	344	54.3%	45.7%	2.6%	0.6%	1.2%	0.3%		
5	Nordin et al	2007	165	-	-	-	-	7.3%	0.6%		
6	Singh et al	2009	265	42.6%	57.4%	3%	0.7%	15.1%	4.1%		
7	Present study	2014	171	36.2%	63.8%	7.01%	5.26%	1.16%	1.16%		

In this study 61.15% of breech were delivered by CS, there is a neonatal mortality rate in breech of 1.4 % and corrected perinatal mortality (i.e excluding IUD and congenital anomalies) of 2.87%. Our perinatal morbidity in vaginal delivery in terms of low APGAR(<7) at 1minute is7.19% & caesarian delivery is 7.91 % .So very low(0-3) APGAR at 1min is 1.4 % which corroborates with the finding of Goffin et al 2006.

In the present study, incidence of face presentation is 6.43% & out of which 18.2% had low APGAR at one minute those cases were delivered vaginally but caesarean section in face presentation was not associated with perinatal morbidity. We didn't find low APGAR at 5min in both vaginal and CS delivered cases of face presentation. 100% cases of brow ,33.34% cases of shoulder and 50% cases of elbow & hand prolapsed cases were associated with perinatal morbidity and all were delivered through CS. With regards to perinatal mortality, 2.87% of breech, 50% of brow, 25% of elbow and hand prolapse were observed out of all presentation. Apart from breech (1.43%) ,25% of brow & 25% of elbow & hand prolapse are associated with neonatal mortality.

In different studies, potential short-term maternal benefits of planned vaginal delivery compared with planned cesarean delivery included a shorter maternal length of hospital stay, lower infection rates, fewer anesthetic complications, and higher breastfeeding initiation rates .We

	Vaginal(n=62)	Caesarean Section (n=109)
Requirement of BT		1.83(2)
Uterine Incision Extension		4.58(5)
Hospital acquired infection		3.7(4)
PPH	6.45(4)	4.58(5)
Perineal tear	8.06(5)	
Wound sepsis & wound dehiscence		0.91(2)
Total	14.51(9)	16.5(18)

Incidence of maternal complications was (16.5%) in CS as compared to vaginal delivery (14.5%) in term singleton malpresentation.

Age group as a factor & 21-34 yrs are most commonly associated with bad maternal outcomes. But the occurrence of PPH is highest among women >35 yrs. So Increased parity may be a risk factor for bad maternal outcome in term singleton malpresentations.

SUMMARY:

There is increased reluctance in many centers to allow vaginal birth in patients with breech presentation after the publication of the Term Breech Trial (Hannah et al 2000) In our study we adopted assisted breech delivery in case of breech .We found 38.84% cases of breech, 63.6% cases of face were delivered vaginally whereas all cases of brow, shoulder, elbow and hand prolapse including 61.2% of breech and 36.4% of face presentation were delivered through CS. The overall perinatal mortality in our study is 11.69% whereas total neonatal mortality was found to be 2.34%. But after excluding IUD and congenital anomalies the corrected perinatal mortality is 4.09%. When we are comparing the neonatal mortality, 2.75% of CS & only 1.61% of vaginal deliveries in malpresentation were observed.

In comparison to other studies regarding breech, perinatal and morbidity rates, our study also correlates with Bassawa et al 2004 in terms of perinatal mortality in CS deliveries far lower than Singh et al 2009 (4.1%).But when we compared the perinatal mortality in breech vaginal deliveries it is far lower than other studies after term breech trial as shown in table-19

got similar results in our study (NIH statement 2006). Whereas maternal benefits of Cesarean delivery compared with a planned vaginal delivery included a decreased risk of postpartum hemorrhage and transfusion, fewer surgical complications, and a decrease in urinary incontinence during the first year of delivery, we contradict this statement as in our study, as there are increased maternal complication in terms of the parameters described where incidence of maternal outcome is more in cesarean delivery (16.5%) than in vaginal delivery(14.5).Maternal outcomes that seemed to favor neither delivery route included postpartum pain, pelvic pain, postpartum depression, anorectal function, sexual function.

In other studies like Singh et al 2012 an unexpected finding was the relationship between breech presentation incidence and corresponding cesarean rates suggesting the possibility of an over-reporting bias in the reporting of breech / malpresentation. They found a 15.1% of neonatal mortality in vaginal delivered patients and 4.1% mortality in CS. Probably the confounding factor like IUD other congenital and diseased condition where vaginal delivery is a compelling indication are not excluded .May be baseline criteria are not set right in those studies. Over-reporting the number of such births could lead to a systematic underestimation of the percentage of breech/ malpresentation delivered by cesarean as most non-breech term infants are delivered vaginally.

However, it may be the case that reporting of breech/malpresentation may not be consistent across regions according to other studies as shown in table 19. The source of inconsistency may be differences in the assessment and reporting of malpresentation. We believe that the large differences in the incidence of breech and corresponding variation in breech caesarean rates and vaginally delivery rates according to study are likely due to differences in assessment and reporting, as well as variations in clinical decision making.

A policy of elective caesarean section for all term breech fetus has been criticised because of its likely effects on maternal morbidity and mortality and the training of obstetric staff. Using decision analysis Bingham and Lilford concluded that planned abdominal delivery might be a safer option for the mother even if only 17% of trials of vaginal breech delivery were unsuccessful. (Bingham et al 1987) Feldman and Freiman calculated that routine elective caesarean might be safer when the incidence of failed trial of labour was greater than 26%. As 40% of trials of vaginal breech delivery result in emergency surgery, (Feldman et al 1985) the maternal benefits of such a policy may be more imagined than real. Whether enough vaginal breech deliveries are taking place to allow resident obstetric staff to have reasonable experience is questionable. Furthermore, from this data, it is not possible to make conclusions about the potential benefits of caesarean section for breech & other malpresentation to prevent mortality due to the variability of decision making and the inability to exclude confounding factors i.e parity, Age etc. In our study, 16 patients planned for vaginal delivery underwent emergency CS for nonprogression in breech presentation. Elective/planned CS was done in case of 12 breech presentation who did not give consent for planned vaginal delivery & underwent CS. Some of them might have successfully delivered if trial for vaginal delivery would have been made. Same is with the cases of bad obstetric history in breech presentation. So decision making requires proper counseling. In cases of face presentations, vaginal delivery has a very good maternal & perinatal outcome. Trial of vaginal delivery can be given safely unless otherwise indicated. In brow presentation, out of 4 brow presentation, 2 were planned for vaginal delivery & expected for spontaneous correction to vertex but underwent emergency CS for persistent brow presentation. So, insufficient data & limited period of study cannot make about the optimal outcome of CS over vaginal delivery. In cases of 7 transverse lie (presentation was shoulder), admitted for confinement, 4 were expected for spontaneous conversion to vertex but 2 of them had cord prolapse with rupture of membrane & 2 of them had fetal distress & underwent emergency CS. Another 2 of shoulder presentation did not give consent for vaginal expectation & they were with bad obstetric history. Hand prolapse required emergency CS & elbow presentation in labor require emergency CS. In 4 compound presentations, we had 1 vaginal delivery with good perinatal & maternal outcome & 3 underwent emergency CS for nonprogression of labor. So insufficient data & limited period of study limits the decision in favour of optimal outcome in CS.

We suggest that different studies for incidence of different malpresentation and their outcome should be carried out with sufficient data which needs extensive period of study. As because till date breech is the most common malpresentation but there are also other malpresentation may be common in some other region yet not studied.

Recently, the results have become available on both the neonatal and the maternal outcome of deliveries after randomization in the term breech trial. At two years, in contrast to the original results in which perinatal death and serious neonatal morbidity were higher in the planned vaginal delivery group, no differences were evident in the combined outcome variable, including death after delivery and neurodevelopmental delay. (Scherjon et al 2005) Most cases of neonatal death and morbidity in the term breech trial cannot be attributed to the mode of delivery. Moreover, analysis of outcome after 2 years has shown no difference between vaginal and abdominal deliveries of breech babies. It is now concluded that the original term breech trial recommendations should be withdrawn (Glazerman et al 2006).

Offering a trial of vaginal delivery in breech & other malpresentation where the condition favors, to well counselled strictly selected patients remains an appropriate option. (Hopkins et al 2007) Vigorous intrapartum monitoring and proper technique of breech delivery & other malpresentations have been established as the most important determinant for successful outcome in vaginal breech delivery without

compromising fetomaternal well-being and curtailing the caesarean section rate.

Vaginal delivery is still warrantable except compelling indications, in well-counselled strictly selected patients. In this study, there was a majority of unbooked cases in advanced labour which suggest possible direct relationship with lack of education and antenatal checkup. However, these findings would have been modifiable in booked and well-counselled cases.

CONCLUSION:

As seen in other studies, we do not favour the policy of wholesome elective Caesarean Section for term singleton breech because of its likely effect in maternal morbidity and no significant difference in perinatal outcome. Same is in the case of face presentation. Other presentations like brow & shoulder need sufficient data to reach the optimized benefit of Caesarean Section over vaginal delivery. Hand prolapsed & elbow Presentation in labor are themselves indication of caesarean section Low socioeconomic status, illiteracy, delayed referral in the sequence of health care delivery system increases the risk of perinatal outcome both in vaginal and Caesarean Section as the maximum cases of neonatal death are the unbooked cases from remote places and after emergency Caesarean Section. Hence early diagnosis, proper antenatal checkups, quick referral, decision by case to case basis, training of obstetrics staff will have better perinatal & neonatal outcome if practiced. Delay in referral pose a significant risk to both mother and the fetus, so the trial of labor can be undertaken at the secondary referral hospitals where all the facilities for Caesarean Section are available and the optimization of the outcome can be done by proper training and regular practice of trial of labor. Rationalised approach will decrease the number of non deserving Caesarean Section, hence decreasing maternal morbidity & risk of future bad obstetric outcome associated with Caesarean Section.

In countries where the majority of cesarean sections for breech are done in emergency, a trial of vaginal delivery yields comparable results. In malpresentation like brow and shoulder there is insufficient data to prove the vaginal delivery is a safer option. So in those cases Caesarean Section delivery is still the safe mode of delivery. Therefore, it is concluded that the balanced decision about the mode of delivery on a case by case basis as well as conduct, training, and regular drills of trial of vaginal delivery will go a long way to optimize the better outcome of malpresentations.

Overall morbidity and mortality cannot be assigned to a particular group of deliveries unless until the complete malpresentation status and their outcomes in a particular malpresentation would not be studied in detail in further studies.

REFERENCES:

1. Alarab M, Regan C, O'Connell MP, Keane DP, O'Herlihy C, Foley ME. Singleton vaginal breech delivery at term: still a safe option. *Obstet Gynecol* 2004 Mar;103(3): 407-12.
2. Al-Inizi SA, Khayata G, Ezimokhai M, Al-Safi W. Planned vaginal delivery of term breech remains an option: result of eight years experience at a single centre. *J Obstet Gynaecol* 2005;25: 263-6.
3. Awwad JT, Nahhas DE, Karam KS: Femur fracture during caesarean breech delivery. *Int J Gynaecol Obstet* 43:324, 1993 [PMID:7907046].
4. Bashir R, Khattak K, Anwar A. Planned vaginal delivery versus elective lower segment caesarean section for breech presentation at term. *J Ayub Med Coll* 2000; 12:3-5.
5. Bassaw B, Ramprasad N, Roopnarainasingh S et al. Correlation of fetal outcome with mode of delivery for breech presentation. *J Obstet Gynecol*. 2004;24:254-8.
6. Brenner WE, Bruce RD, Hendricks CH: The characteristics and perils of breech presentation. *Am J Obstet Gynecol* 118:700, 1974 [PMID: 4813810].
7. Bingham P, Lilford RJ. Management of the selected term breech presentation: assessment of the risks of selective vaginal delivery versus caesarean section for all cases. *Obstet Gynecol* 1987;69:965-78.
8. Bingham P, Hird V, Lilford RJ. Management of the mature selected breech presentation: an analysis based on the intended method of delivery. *Br J Obstet Gynecol* 1987;94:746-52.
9. Casey BM, McIntire DD, Leveno KJ: The continuing value of the Apgar score for the assessment of newborn infants. *N Engl J Med* 2001;344(7):467-471.
10. Cheng M, Hannah M: Breech delivery at term: A critical review of the literature. *Obstet Gynecol* 82:605, 1993 [PMID:8377990].
11. Clausen I, Nielsen KT: Breech position, delivery route and congenital hip dislocation. *Acta Obstet Gynecol Scand* 67:595, 1988.
12. Committee on Fetus and Newborn, American Academy of Pediatrics, Committee on Obstetric Practice, American College of Obstetricians and Gynecologists: Use and abuse of the Apgar score. *Pediatrics* 1996, 98(1):141-142.
13. Confino E, Gleicher N, Elrad H, Ismajovich B, David MP. The breech dilemma: a review. *Obstet Gynecol Surv* 1985;40:330-7.
14. Kruikshank DP, White CA: Obstetric malpresentations: Twenty years' experience. *Am J Obstet Gynecol* 116:1097, 1973 [pmid:4721139].
15. De Leeuw JP, DE Haan J, Derom R, Thiery M, Martens G, van maele. Mortality and early neonatal morbidity in vaginal and abdominal deliveries in breech presentation. *J Obstet Gynecol* 2002 Mar;22(2): 127-39.
16. Dewhurst's textbook of Obstetrics & Gynecology, 8th edn; Chapter 26:311-324

17. Eller DP, Van Dorsten JP: Route of delivery for the breech presentation: A conundrum. *Am J Obstet Gynecol* 173:393, 1995[7645613].
18. Feldman GB, Freiman JA. Prophylactic caesarean at term? *N Engl J Med* 1985;312: 1264-7.
19. Geutjens G, Gilbert A, Helsen K: Obstetric brachial plexus palsy associated with breech delivery. A different pattern of injury. *J Bone Joint Surg [Br]* 78:303, 1996.
20. Gifford DS, Morton SC, Fiske M, et al: A meta-analysis of infant outcomes after breech delivery. *Obstet Gynecol* 85:1047, 1995 [PMID:7770253].
21. Gimovsky ML, Wallace RL, Schifrin BS, Paul RH. Randomized management of nonfrank breech presentation at term: a preliminary report. *Am J Obstet Gynecol* 1983; 146: 34-40.
22. Guiliiani A, Scholl WMJ, Basver A, et al. Mode of delivery and outcome of 699 term singleton breech deliveries at a single center. *AJOG*.2002;187:1664-8.
23. Glezerman, Marek MD. Five years of term breech trial: the rise and fall of a randomized controlled trial. *Am J Obstet Gynecol*.2006;194:20-5.
24. Goffinet F, Carayol M, Foidart JM, et al. Is planned vaginal delivery for breech presentation at term still an option. *Am J Obstet Gynecol*. 2006;194:1002-11.
25. Goplerud J, Eastman NJ, Compound presentation: Survey of 65 cases. *Obstet Gynecol* 1:59, 1953 [PMID: 13013641].
26. Greene TR, Gardeil F, Turner MJ. Long term implications of caesarean section. *Am J Obstet Gynecol* 1997; 176:254-55.
27. Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, SAigal S, Willan AR. Planned caesarean section versus planned vaginal birth for breech presentation at term : a randomized multicentre trial. Term Breech Trial Collaborative Group. *Lancet* 2000Oct 21; 356(9239): 1375-83.
28. Hemminki E, Merilainen J. Long term effects of caesarean sections: ectopic pregnancies and placental problems. *Am J Obstet Gynecol* 1996; 174: 1569-74.
29. Hofmeyr GJ, Hannah ME. Planned caesarean section for term breech delivery. *Cochrane Database Syst Rev*2003; (3)Cd000166.
30. Hopkins LM, Esakoff T, Noah MS, Moore DH, Sawaya GF, Laros RJ Jr. Outcomes associated with caesarean section versus vaginal breech delivery at a university hospital. *J Perinatol* 2007;27:141-6.
31. Jadoon S, Jadoon S M K, Shah R. Maternal and Neonatal Complications in Term Breech Delivered Vaginally; *Journal of the College Physicians and Surgeons Pakistan* 2008, Vol. 18 (9):555-558.
32. John C. Hauth and F. Gary Cunningham. Vaginal Breech Delivery Is Still Justified. *Obstetrics & Gynecology* 2002 June 99(6): 1115-16.
33. Johnson CE: Transverse presentation of fetus. *JAMA* 187:642,1964[pmid: 14088443]
34. Lahsen H, Fear K, Sturdee D. Trends in the management of the breech presentation at term: experience in a District General Hospital over a 10-year period. *Acta Obstet Gynecol Scand* 2002 Dec;81(12):1116-22.
35. Lindqvist A, Norden-Lindeberg S, Hanson U. Perinatal mortality and route of delivery in term breech presentations. *Br J Obstet Gynecol* 1997Nov; 104(11): 1288-91.
36. Marc J.N.C Keirse. Evidence-Based Childbirth Only For Breech Babies? *BIRTH* 2002 March 29(1): 55-59.
37. Montreal, Que: Face & brow presentation; Canada M.A.J July 1950 vol.63.
38. NIH State-of-the Science Conference Statement on Caesarean delivery on maternal request. *NIH Consens State Sci Statements* 2006;23:1-29. Available at: <http://consensus.nih.gov/2006/cesareanstatement.pdf>.
39. Nordin NM. An audit of singleton breech deliveries in a hospital with a high rate of vaginal delivery. *Malays J Med Sci*. 2007;14:28-37.
40. Obeichina N J, Okolie V E, Eleje G U, Okechukwu Z C, Anemeje O A; Twin versus singleton pregnancies : the incidence pregnancy complications, and obstetric outcomes in a Nigerian tertiary hospital *International Journal of Women's Health* 2011;3 227-230.
41. Paterson CM, Saunders NJSIG. Mode of delivery after one caesarean section: audit of current practice within a health region. *BMJ* 1991;303:818-21.
42. Rietberg CC, Elferink-Stinkens PM, Visser GH: The effect of the Term Breech Trial on medical intervention behavior and neonatal outcome in The Netherlands: An analysis of 35,453 term breech infants. *Br J Obstet Gynecol* 112(2):205,2005.
43. Sanchez-Ramos L, Wells TL, Adair CD, Arceln G, Kaunitz AM, Wells DS. Route of breech delivery and maternal and neonatal outcomes. *Int J Gynecol Obstet* 2001;73:7-14.
44. Scherjon SA, van Roosmalen J. Breech presentation at term: the caesarean section that is routinely advised is ultimately not safe for the child. *Ned Tijdschr Geneeskd* 2005; 149: 2204-6.
45. Schuitmaker N, Van Roosmalen J, Dekker G, van Don-gen P, van Geijn H, Gravenhorst JB. Maternal mortality after Caesarean section in the Netherlands. *Acta Obstet Gynecol Scand* 1997; 76: 332-34.
46. Schutte MF, van Hemel OJS, van de Berg C, et al: Perinatal mortality in breech presentations as compared to vertex presentations in singleton pregnancies in the Netherlands. *Eur J Obstet Gynecol Reprod Biol* 19:391, 1985[PMID:4018378].