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A RETROSPECTIVE INVESTIGATION OF PRETERM BIRTH IN BREECH PRESENTATION DURING THE PERIOD OF 26 YEARS

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SUMMARY. Breech presentation is childbirth, during which may be expected higher perinatal mortality and morbidity when compared to cephalic presentation. The breech presentation complicates 20–35 % of preterm delivery. This group of neonates is exposed to hypoxic damages, as well as birth injuries with consequent intracranial hemorrhages. The mortality rate of preterm infants is much higher than the mortality of full-term infants. A higher risk of perinatal asphyxia and birth trauma makes obstetricians decide for operative completion by Cesarean section.

Research methods. We conducted a retrospective study and analyzed and compared perinatal categories: perinatal mortality and morbidity, the mode of pregnancy completion, and the incidence of Cesarean section and vaginal delivery in six periods. Patients and research methods. The studied material was collected for the period of the past 26 years from the archives in the Department of Obstetrics and Gynecology. All singleton pregnancies with the breech presentation were analyzed, delivered either vaginally or by Cesarean section. Results. The incidence of Cesarean sections in preterm births with breech presentation gradually grows through the studied period. Obstetricians were increasingly opting for a Cesarean section in the situation of preterm birth and breech presentation, to eliminate traumatic and hypoxic damage, and thus tried to reduce perinatal mortality. The perinatal mortality rate of premature fetuses in a breech presentation who were delivered vaginally, according to numerous authors was statistically significantly higher compared to the perinatal mortality of premature neonates who were delivered by Cesarean section.

Conclusion. The research emphasizes the importance of the completion of the premature birth of a child in the breech presentation by Cesarean section if the child is alive and there are no identifiable development defects.

Introduction

According to various authors, the prevalence of preterm birth ranges between 5–15%, partly because of different definitions, partly because of racial differences, but also because of ethnic groups, countries and institutions where available data are obtained.¹

Every birth, regardless of the infant's weight at birth, at fewer than 37 weeks' gestational age is preterm birth. A breech position or presentation is an irregular position in which the foetus is in a longitudinal lie with its buttocks located above the cervix, i.e. the internal os.² Causes or factors that increase the risk which result in a breech presentation involve diverse conditions which disable cephalic presentation or involve foetal inability to adequately move.² In preterm birth, especially before the 32nd gestational week, the breech presentation of the foetus is more common particularly since the foetal physiological rotation has not yet been completed. In vaginal preterm breech delivery, the child is exposed to greater risk of trauma and hypoxia than at cephalic presentation. In a large number of preterm babies, various authors, from 15% to 20%, give a special significance to preterm breech birth.³ A less favourable outcome of preterm breech delivery is correlated with a greater number of complications with the umbilical cord and hypoxia, and the difficult passage of a relatively large head of the preterm fetes through an insufficiently enlarged or un-

prepared birth canal, i.e. the rapid passage of the baby's head which is observed in multiparous women.³ It should be emphasized that there is a greater possibility of cerebral bleeding of either traumatic or hypoxic origin. A preterm breech infant has a worse outcome than one of the same gestational age delivered in a cephalic position.^{1,2,3} In addition, there is a great vulnerability of cerebral, still insufficiently mature blood vessels.⁴ Complications in pregnancies and deliveries with breech presentation are more often caused by pathological conditions that had directly or indirectly caused this presentation and the obstetric interventions which aim to reverse the presentation into cephalic, than the improper presentation itself.³ Consequences which are often indicated are a premature breaking of the water sac, umbilical cord lowered or prolapsed, primary or secondary inertia of labour and prolonged labour with the associated foetal hypoxia, acidosis and infection. With that presentation increased perinatal mortality and morbidity are associated. Increased perinatal risk is a consequence of asphyxia, and increased frequency of birth trauma in vaginal delivery. Factors that increase the risk of an unfavourable perinatal outcome are often complications of pregnancy and childbirth, which occur more frequently than with preterm cephalic delivery. In vaginal breech delivery, the infant is exposed to greater risk of traumatic and hypoxic injuries than in cephalic presentation.⁴ Saling found cerebral haemorrhage in 14%

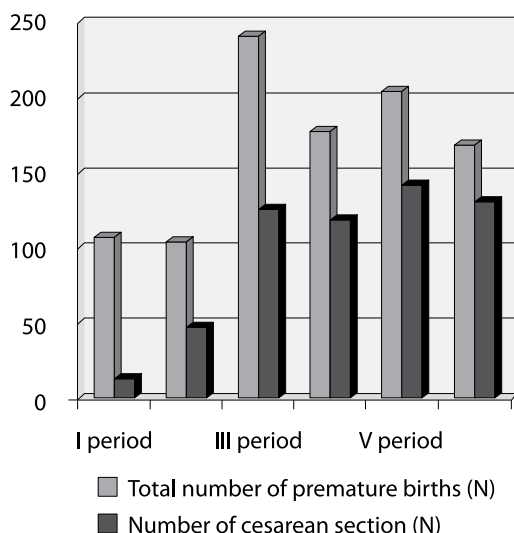


Figure 1. The frequency of cesarean section in early premature births breech presentation

Table 1. The frequency of cesarean section in early premature births breech presentation

	I period 1974.–1976.	II period 1984.–1986.	III period 1987.–1992.	IV period 1995.–1998.	V period 2001.–2005.	VI period 2007.–2011.
Total number of (N) premature births	107	104	241	177	204	168
Number of cesarean section N (%)	13 (12.2%)	47 (45.2%)	126 (52.3%)	118 (66.7%)	142 (69.6%)	130 (77.38%)

Table 2. The incidence of premature births breech presentation in relationship to the total number of births in breech presentation

Period	The total number of births in breech presentation (N)	Premature births in breech presentation (N; %)
I period 1974.–1976.	529	107 (20.3%)
II period 1984.–1986.	543	104 (19.2%)
III period 1987.–1992.	1113	241 (21.7%)
IV period 1995.–1998.	728	177 (24.3%)
V period 2001.–2005.	799	204 (25.5%)
VI period 2007.–2011.	655	168 (25.7%)

Table 3. The number of premature births completed by cesarean section and vaginal route; perinatal mortality (PM) over the analyzed periods

Period	Total number of premature births in breech presentation	Number of cesarean section N (%)	Vaginal premature deliveries N (%)	PM (‰)
I period	107	13 (12.15%)	94 (87.85%)	1 (0.934‰)
II period	104	47 (45.19%)	57 (54.81%)	3 (2.884‰)
III period	241	126 (52.28%)	115 (47.72%)	7 (3.043‰)
IV period	177	118 (66.67%)	59 (33.33%)	5 (2.825‰)
V period	204	142 (69.60%)	62 (30.40%)	6 (2.941‰)
VI period	168	130 (77.38%)	38 (22.62%)	3 (1.786‰)
TOTAL	1001	576	425	25 (2.498‰)

of the full terms and 70% of preterms.⁵ Rovinsky et al. found traumatic injuries in 54% and hypoxic injuries in 46% of deceased infants.⁶ Bone fractures, nerve and soft tissue injuries are more commonly observed in breech births. Đelmis et al. determined a wide application of Caesarean section in preterm breech births, especially between 33 and 37 weeks, which significantly reduces the mortality of newborns, but during the gestation from 29 to 32 weeks did not find any significant difference.⁴ The survival of a preterm depends both on its trauma and hypoxia during delivery, as well as on postnatal hypoxia. A preterm which avoided trauma and hypoxia when delivered by Caesarean, is still exposed to postnatal risk from respiratory and other complications directly related to its biological immaturity.⁷ Therefore, the outcome of the preterm depends not only on the ophthalmic procedure during delivery but also on the availability of neonatal care.⁷

Materials and Methods

A retrospective study was performed over six major periods, comparing perinatal mortality and morbidity, pregnancy completion, as well as the incidence of Caesarean and vaginal delivery. The examinees/sample was all breech position singletons, at the Clinical Department of Gynaecology and Obstetrics Zagreb, Petrova 13, completed by caesarean section. The sample was collected through six major periods over 26 years.

Results

Retrospective analysis of all singleton preterm breech births in 26 years showed an increasing trend to perform preterm deliveries by Caesarean section (*chart 1*). In the I-period (1974–1976), there were 12.2% Caesareans in breech preterm infants, continuously increasing through all the investigated periods up to the VI period (2007–2011) in frequency up to 77.38%; which by the last period represents a 6.34 times higher incidence of Caesareans in the completion of preterm breech deliveries (*Table 1*).

The prevalence of preterm breech births in relation to the total number of breech births in the analysed periods ranged from 19.2% to 25.7% (*Table 2*). Perinatal mortality (PM) during the analysed periods ranged from 0.934‰ (I-period 1974–1976) to a maximum of 3.043‰ (III-period 1987–1992). The last analysed period (VI-period 2007–2011) had a PM of 1.786‰ (*Table 3*). From the data analysed, it is evident that mortality in

Table 4. Distribution of births in breech presentation through six investigated periods according to the weeks of pregnancy

Weeks of pregnancy	I period 1974.–1976.	II period 1984.–1986.	III period 1987.–1992.	IV period 1995.–1998.	V period 2001.–2005.	VI period 2007.–2011.
29.–32.	40 (7.6%)	26 (4.8%)	70 (6.3%)	39 (5.4%)	55 (6.9%)	33 (5.04%)
33.–37.	67 (12.7%)	78 (14.4%)	171 (15.4%)	138 (18.9%)	149 (18.6%)	135 (20.61%)
≥38.	422 (79.7%)	439 (80.8%)	872 (78.4%)	551 (75.7%)	595 (74.5%)	487 (74.35%)

premature breech births gradually decreased during the analysed periods, despite the ever more frequent trend of completion of such births by caesarean section. The analysed data suggests that we have probably reached the lowest possible numbers in perinatal mortality by implementing C-section as a safer delivery for breech infants and by having better and more optimal expertise of good neonatal care. In this study it is apparent that during the six analysed periods there is an average between 4.8% and 7.6% of breech births between 29–32 weeks; 12.7%–20.61% breech births between 33–37 weeks; and between 74.5%–80.8% of breech births by 38 and more weeks of gestation (Table 4).

Discussion

Breech presentation has been known to be linked to higher perinatal mortality and even bigger morbidity.⁷ From historical data and clinical experience it is logical to conclude that a higher perinatal risk with incidences of asphyxiation and a traumatic component is primarily associated with vaginal delivery. Factors that increase the risk of an unfavourable perinatal outcome are a direct consequence of complications during pregnancy and childbirth that occur at a higher incidence in breech premature births.

Goldenberg and Nelson reported back in 1977 in their retrospective study of the importance of completing all preterm breech births by Caesarean section, to reduce the frequency of asphyxiating and traumatic damage and reduce perinatal mortality.⁸ Döring et al. report 29.6% perinatal mortality in the period from 1965 to 1973.⁹ During the period from 1974 to 1976, Đelmiš et al. recorded births from 29–32 weeks of gestation perinatal mortality was 32.5%, and in infants from 33–36 weeks mortality was 19.4%.⁴

Each country organises its monitoring of the survival of all newborns by grouping them according to weeks of gestation. Although the smallest and the extremely early periviable births make less than 1% of all newborns, today they still form the largest mortality group. Survival of preterm infants is directly dependent on the length of the pregnancy; the shorter its duration, the higher the mortality of the infants which are then more prone to illness. As a rule, preterm infants are significantly less healthy and have long-term difficulties and higher mortality rates than term infants. In Slovenia, in 1986, the mortality rate of preterm breech infants was 25.8%.¹⁰ Newer data from Amon and his associates in-

dicating the preterm breech neonate survival rate. Altogether 35% of infants with birth weights less than 1000g and 60% of infants delivered by Caesarean section survived.¹¹ Ghosha's newer data and retrospective research on 'The International Term Breech Collaborative Group' report that a planned caesarean section is a better and for the infant safer method of completing breech delivery.² Retrospective research by Golfier and associates demonstrate and point out that a term vaginal breech delivery significantly increases the risk of perinatal complications and perinatal mortality, and therefore an elective Caesarean section is preferred.¹² At the same time, the risk of maternal complications in such births is only moderately elevated.¹² Rietberg et al. report to us about mortality and morbidity rates on the sample of 33824 term breech deliveries and the method of delivery from 1995 and 1999 in the Netherlands.¹³ Thus, vaginal breech delivery and emergency Caesarean section delivery show seven times lower Apgar score, three times more birth trauma, and two times higher perinatal mortality than delivery by elective Caesarean section.¹³ Whether widespread use of Caesarean section at premature breech deliveries significantly reduces infant mortality has been the subject of different opinions in recent years. In addition, numerous factors are known to occur more frequently in breech births and can thus increase the risk of an unfavourable perinatal outcome. These are: foetal developmental disorders, primary or secondary inertia of labour, prolonged labour, preterm delivery and prematurity, premature rupture of the membranes, perinatal infection, umbilical cord prolapsed, placenta praevia, foetal distress and birth trauma, manual extraction, preeclampsia, not fully dilated cervix, etc.¹⁴

The obstetrician's greatest doubt with breech presentation is whether to proceed with vaginal delivery or an elective Caesarean section. At present, most authors prefer Caesarean section for preterm breech deliveries. The frequency of an elective caesarean section in the world today is between 50% and 100%.

Thus, in cases of preterm breech deliveries, most authors, when good neonatal care is available, recommend breech delivery by Caesarean section. Hochuli¹⁵ and associates refer to the lowest limit for a Caesarean section 1,000g; Audra¹⁶ and associates refer to <32 weeks; while for Lelle¹⁷ and associates it is <37 weeks; Mecke¹⁸ and associates imply Caesarean section when the baby's weight is between 1000 and 2500 grams. Niles¹⁹ and associates in their retrospective study investigated 176

premature breech births indicating the importance of completing a pregnancy by Caesarean section because of a significant reduction in neonatal mortality and morbidity. Thomas²⁰ and associates studied the perinatal survival of preterm neonates of extremely small birth weight born between 23 to 26 weeks of gestation and concluded that whether the delivery was vaginal or by caesarean section, it didn't significantly affect neonatal survival at this gestational age. Toivonen²¹ and colleagues in their cohort retrospective study note lower Apgar score values in the 1st minute in preterm vaginal breech deliveries than by Caesarean. In the Clinic for Gynaecology and Obstetrics, Đelmiš et al emphasize a liberal and wide-ranging application of the Caesarean section as a mode of preterm breech delivery between 33 and 37 weeks of gestation.⁴

Conclusion

Retrospective analysis over six periods shows us the importance of using Caesarean section for delivering preterm breech infants, if the foetus is alive and has no recognizable developmental long-term difficulties. Good neonatal care deems possible choosing caesarean section as method of delivery even for infants at every low gestational age and particularly those from 33 to 37 weeks of gestation. Due to high mortality in vaginal preterm breech delivery, most authors recommend Caesarean section. This mode of delivery at the same time prevents hypoxic and traumatic brain lesions in preterm infants. If there are no optimal neonatal care conditions when performing a Caesarean section in the interest of the child and gestation shorter than 33 weeks, the caesarean will not significantly improve perinatal results while increasing the risk for the mother at the same time.

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RETROSPEKTIVNO ISTRAŽIVANJE PRIJEVREMENIH POROĐAJA U STAVU ZATKOM U RAZDOBLJU OD 26 GODINA

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Izvorni znanstveni članak

Ključne riječi: prijevremeni porođaj, stav zatkom, perinatalni mortalitet, carski rez

SAŽETAK. Stav zatkom predstavlja prezentaciju čeda, kod koje možemo očekivati veći perinatalni mortalitet i morbiditet u odnosu na stav glavičicom. Učestalost prijevremenih porođaja u stavu zatkom kreće se od 20–35%. Tako prijevremeno porođena djeca izloženija su hipoksičnim oštećenjima, kao i traumatskim ozljedama s posljedičnim intrakranijalnim hemoragijama. Smrtnost nedonoščadi je višestruko veća od smrtnosti donošene djece. Veći rizik od perinatalne asfiksije i porođajne traume češće rezultira s većom učestalošću operativnog dovršenja porođaja carskim rezom, za koji se češće odlučuju porodničari. *Metode istraživanja.* Provedena je retrospektivna studija kroz šest velikih razdoblja, gdje je uspoređen perinatalni mortalitet i morbiditet, način dovršenja trudnoće, kao i učestalost carskih rezova i vaginalnih porođaja. Ispitanice i način istraživanja provedenog tijekom 26 godina bile su sve jednodne trudnoće s djetetom u stavu zatkom, završene carskim rezom. *Rezultati.* Učestalost carskih rezova kod prijevremenih porođaja zatkom postupno raste kroz istraživana razdoblja. Porodničari se sve češće odlučuju za carski rez kod prijevremenih porođaja djece u stavu zatkom, kako bi eliminirali traumatsko i hipoksično oštećenje, te tako pokušali smanjiti perinatalni mortalitet. Perinatalni mortalitet vaginalnih porođaja prijevremeno porođene djece u stavu zatkom, prema brojnim autorima je statistički znakovito veći, od perinatalnog mortaliteta prijevremeno porođene djece carskim rezom. *Zaključak.* Provedeno istraživanje nas upućuje na važnost dovršenja prijevremenog porođaja djeteta u stavu zatkom carskim rezom, ako je dijete živo i nema prepoznatljive mane razvitka.