

# Breech Presentation: Determinants of the Delivery Route and Neonatal Prognosis at the University Hospital Center of Brazzaville (Republic of Congo)

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## To cite this article:

Buambo Gauthier Regis Jostin, Eouani Levy Max Emery, Ngami Ariane Gloire, Mokoko Jules Cesar, Potokoue Mpia Sekangue Samantha Nuelly, Itoua Clautaire, Iloki Leon Herve. Breech Presentation: Determinants of the Delivery Route and Neonatal Prognosis at the University Hospital Center of Brazzaville (Republic of Congo). *Journal of Gynecology and Obstetrics*. Vol. 10, No. 2, 2022, pp. 92-96. doi: 10.11648/j.jgo.20221002.16

Received: February 26, 2022; Accepted: March 14, 2022; Published: March 18, 2022

**Abstract:** Objective. To analyze the determinants of the delivery route and the neonatal prognosis in case of breech presentation at the University Hospital Center of Brazzaville. Method. Monocentric analytical cross-sectional study conducted from January 1 to December 31, 2019 in the Obstetrics Gynecology Department of the University Hospital Center of Brazzaville, comparing 54 women who gave birth by cesarean section and 23 women who gave birth vaginally. Were included all women who gave birth to a fetus in breech presentation whose chronological age was greater than or equal to 28 weeks of amenorrhea or a birth weight greater than 1000 g and their newborn. The variables studied were pre, per and post partal. The p-value of the probability was considered significant for a value less than 0.05. Results. Breech delivery represented 1.6% of deliveries, i.e. 97 out of 6075. The women delivered were not different in age [29 (24-34) vs 29 (26-33),  $p > 0.05$ ] nor in parity [1 (0-3) vs 2 (0-3),  $p > 0.05$ ]. Most of them gave birth by caesarean section (63.9% vs 36.1%). The determinants of the delivery route were: level of education (48.1% vs 73.9%; OR=3.1 [1.04-8.9];  $p < 0.05$ ), gestational age less than 34 WA (0% vs 13%;  $p < 0.05$ ), the existence of a uterine scar (22.2% vs 0%;  $p < 0.05$ ) and insufficient fundal height (3.7% vs 26.1%; OR=0.12 [0.02 – 0.7];  $p < 0.05$ ). Neonatal morbidity was not influenced by the route of delivery. Newborns from the vaginal route were the most transferred to neonatology (5.6% vs 34.8%; OR=0.11 [0.3 – 0.47];  $p < 0.05$ ) and died (0% vs. 17.4%;  $p < 0.05$ ). Conclusion. The decision of the way of delivery in case of breech presentation at the University Hospital of Brazzaville depends on both maternal and obstetrical factors. Identifying the determinants requires careful questioning and rigorous obstetrical examination.

**Keywords:** Breech Presentation, Childbirth, Determinants, Prognosis, Congo

## 1. Introduction

Breech presentation is a longitudinal presentation, in which the pelvic end of the fetus presents first in the axis of the superior strait [1]. Its overall frequency in the world

varies between 3% and 5% of deliveries [2]. In Africa, it is between 1.5% and 5.4% [2]. In Congo, its frequency at the Brazzaville Hospital Center is estimated at 4.7% of deliveries [3]. Breech delivery is a situation with high risk of perinatal morbidity and mortality which remains a controversial

subject throughout the world, because of its potentially dystocic nature [4]. As a result, it is a worrying situation for the obstetrical team. According to Hanna's meta-analysis in 2000, it appears that vaginal breech delivery is associated with an increased risk of neonatal morbidity and mortality; hence the recommendation to systematically perform a prophylactic caesarean section [5]. On the other hand, the National College of Obstetrician Gynecologists of France (CNGOF) certifies that there is not sufficient current data to systematically perform a caesarean section, thus favoring the vaginal route [6]. At the Center Hospitalier Universitaire de Brazzaville, studies devoted to breech delivery have been exclusively descriptive, focusing on clinical and prognostic aspects without addressing the determinants of the delivery route. Thus, the present study has set itself the objective of analyzing the determinants of the delivery route in the event of breech presentation at the University Hospital of Brazzaville.

## 2. Method

This was an analytical cross-sectional study conducted from January 1 to December 31, 2019, in the Obstetrics Gynecology Department of the University Hospital Center of Brazzaville, comparing women who gave birth to a fetus in breech presentation vaginally and those who gave birth by caesarean section. Were included for both groups all women who gave birth to a fetus in breech presentation whose chronological age was greater than or equal to 28 weeks of amenorrhea (SA) or with a birth weight greater than 1000 g. Deliveries of malformed and/or dead fetuses on arrival in the

delivery room were excluded. The variables studied were prepartum (socio-demographic and reproductive), perpartum related to delivery methods and postpartum (neonatal characteristics, neonatal death). SPSS version 25 software was used for the statistical analysis. The results were presented as a proportion for the qualitative variables. The quantitative variables were expressed as the mean and its standard deviation or as the median and its quartiles (q1 – q3). Pearson's Chi2 was used to compare percentages. Its corrected, the exact test of Fischer was used in the event of a theoretical number less than or equal to 5. The tests of T-Student and Mann Whitney were used to compare means and medians respectively. The univariate analysis consisted in linking the variable of interest (way of delivery) with all the other explanatory variables. To study the form of the association between the variable of interest and its explanatory variable, the odds ratio (OR) with its 95% confidence interval (CI) was estimated at the significance level below 5%.

## 3. Results

During the study period, 6075 deliveries were performed, including 97 in breech presentation, i.e. 1.6%. The preferred delivery route was caesarean section in 63.9% (n=62) of which seven were excluded, i.e. 10%. Thirty-five women gave birth vaginally, i.e. 36.1%, of whom 12 were excluded, i.e. 34.3%.

The women delivered were not different in age or parity (Table 1).

**Table 1.** Sociodemographic and reproductive characteristics.

	Caeserean section		Vaginal birth		OR [CI 95%]	p
	n	%	n	%		
Age (years)						
Median (q1-q3)	29 (24-34)		29 (26-33)			0.5
Min – Max	17 – 41		20 – 38			
Education level					3.1 [1.04-8.9]	0.04
With level	26	48.1	17	73.9		
Without level	28	51.9	6	26.1		
Gainful activity	21	38.9	10	43.5		0.7
Pregnancy						
Median (q1-q3)	3.5 (2-5)		3 (1-4)			0.9
Min – Max	1 – 12		1 – 9			
Parity						
Median (q1-q3)	1 (0-3)		2 (0-3)			0.8
Min – Max	1 – 7		1 – 8			

Pregnant women with a scarred uterus (n=12 or 22.2%) all gave birth by caesarean section (p=0.01).

Three-quarters of pregnant women with a fundal height between 24 cm and 30 cm (n=8) gave birth significantly

vaginally (Table 2).

In 26 cases, i.e. 76.4%, cesarean section was performed in the event of suspicion of macrosomia defined by a fundal height greater than or equal to 35cm.

**Table 2.** Clinical characteristics.

	Caeserean section		Vaginal birth		OR [CI 95%]	p
	n	%	n	%		
Gestational age (WA <sup>1</sup> )						
Median (q1-q3)	38 (39-40)		37 (34-39)			0.006
Min – Max	34 – 42		28 – 41			

	Caesarean section		Vaginal birth		OR [CI 95%]	p
	n	%	n	%		
[28 – 34]	0	0	3	13.0	1	0.01
[34 – 37]	11	20.4	6	26.1		0.5
[37 – 42]	43	79.6	14	60.9		
Fundal height (cm)						
[24 – 30]	2	3.8	6	26.1	0.12 [0.02 – 0.7]	0.01
[31 – 34]	26	48.1	9	39.1	1	
[35 – 38]	26	48.1	8	34.8	-	0.9
Complete breech fetus	31	57.4	16	69.6	-	0.3
Ruptured membranes	26	48.1	13	56.5	-	0.5

<sup>1</sup>WA: week of amenorrhea.

No pelvic anomaly was noted.

More than half of the women who gave birth were in labor, ie 36 (66.7%). In nearly two-thirds of cases, caesareans were performed during labor for maternal and fetal indications. Maternal indications were dominated by uterine scar (n=12) and primiparity (n=7). As for fetal indications, suspicion of macrosomia and twinning occupied the top of the list in 26 and 8 cases respectively.

At the end of the univariate analysis, the determinants of the mode of delivery were : level of education, gestational age, fundal height and the existence of a uterine scar.

The vaginal route was the preferred delivery route in educated pregnant women, in cases of high or medium prematurity and insufficient uterine height.

Neonatal morbidity and mortality were not influenced by delivery route but by prematurity (Table 3).

**Table 3.** Neonatal characteristics.

	Caesarean section		Vaginal birth		OR	CI (95%)	p
	n	%	n	%			
Apgar score at the 1 <sup>st</sup> min							0.3
Good ( $\geq 7$ )	52	96.3	21	91.3			
Bad (1 à 6)	2	3.7	2	8.7			
Intensive care	13	24.1	7	30.4	-	-	0.5
Transfer in neonatology	3	5.6	8	34.8	0.11	[0.3 – 0.47]	0.001
Death	0	0.0	4	17.4	-	-	0.01

## 4. Discussion

Despite the small size of our sample and the large proportion of vaginal births excluded, which probably influenced our results, the trend is to perform caesarean section in the event of breech presentation in our maternity ward. Several factors influencing the choice of delivery route in case of breech presentation have been reported, such as the age of the pregnant woman.

The young age of pregnant women would be associated with inexperience expressed by the discomfort and non-cooperation of parturients during childbirth, often frequent in the absence of epidural analgesia. However, in cases of advanced age over 35 years and nulliparity, caesarean section seems to be the preferred route providing the most safety compared to the vaginal route which would require continuous and rigorous fetal monitoring in low-resource maternity units. Also, the National College of French Obstetrician Gynecologists (CNGOF) reports that nulliparity is associated with an increased risk of failed vaginal delivery attempt compared to women who have already given birth [7]. No significant difference was noted for age and parity in our series.

Most often related to age, the level of education was a determinant of the mode of delivery, associated three times more with caesarean section among educated pregnant women

who are most often requesters because they are more inclined to understand the risks related to childbirth. In a French study on the evolution of acceptability by obstetricians and patients of the vaginal route in the event of breech presentation, the authors report the increase in the use of caesarean section from 52% to 80% from 1998 to 2004, significantly associated with increasing refusal of the vaginal route by parturients ( $p=0.001$ ) [8]. Many authors have reported a predominance of illiterate or poorly educated women giving birth the most vaginally in case of breech presentation [9, 10].

Clinically, gestational age has been one of the determinants of delivery route as reported in the American guidelines [11]. According to the American College of Obstetrician Gynecologists (ACOG), before 26 weeks of amenorrhea, there would be a lack of quality clinical evidence to help in the choice of delivery route [11]. A large retrospective cohort study recently concluded that between 28 and 31 weeks of amenorrhea, there is a significant reduction in the risk of perinatal morbidity and mortality during a planned delivery by caesarean section in countries where the neonatal management of premature babies is good. However, this risk remains unchanged in case of vaginal delivery between 32 and 36 weeks of amenorrhea [5]. On the other hand, the CNGOF does not recommend one way of delivery rather than another in the event of premature breech delivery. It emphasizes the need to verify the absence of

hyperextension of the fetal head by ultrasound before attempting vaginal delivery and to prefer caesarean section if such a position is demonstrated [6].

As in the case of prematurity, due to a modest technical platform and the difficulties of taking charge of newborns with low birth weight in our hospitals, the vaginal route has been the predominant route in the event of insufficient uterine height, minimizing thus the impact that a caesarean section can have on the psychological, socioeconomic and obstetrical levels in a situation already at high risk of perinatal morbidity and mortality. Faye Dieme in Senegal in 2018, found an influence of prematurity and low birth weight on neonatal prognosis, respectively increasing the risk of neonatal morbidity by 7 (OR=6.8 [1.6 – 28.8];  $p=0.002$ ) and 11 (OR=11.2 [4.2-29.4];  $p=0.001$ ) [12].

About the association of breech presentation and scarred uterus, the rates of planned caesarean sections have multiplied in view of the reluctance to perform obstetrical maneuvers in the event of acceptance of vaginal delivery at term in the event of a scar. uterus [8, 11] despite the recommendations of the CNGOF, which does not consider a history of caesarean section as a contraindication to vaginal delivery in the event of a breech fetal presentation [6].

The fetal weight, although not estimated in our study, influenced the choice of delivery route. The suspicion of macrosomia or a large breech fetus was an indication for caesarean section from the outset. According to the CNGOF, there are insufficient data to recommend the systematic performance of an estimation of fetal weight and/or a measurement of the biparietal diameter as criteria for accepting a vaginal approach [6]. However, if the estimated fetal weight known before birth is greater than 3800 g, a caesarean section is to be preferred [6]. Similarly, twinning due to uterine overdistension, was the subject of elective caesarean section.

Compared to decompleted breech presentation, complete breech presentation at term is not associated with attempted vaginal delivery with an increased risk of severe perinatal morbidity [6, 12].

In addition to various determinants, the choice of delivery route in case of breech presentation depends greatly on the experience of the birth attendant [11]. Caesarean section would be the route preferred by most doctors because of the low experience of the vaginal route [11]. In 2000, high rates of caesarean section in the event of breech presentation (86.9%) in the USA were noted in parallel with a reduction in the number of practitioners experienced in vaginal delivery and insufficient specialist teaching on the vaginal delivery in case of breech presentation [11]. The predominant choice of caesarean section in the Gynecology and Obstetrics department of the University Hospital Center of Brazzaville is partly justified by the decisions of specialist doctors, sometimes influenced by their low level of experience.

While mothers are not affected in distressing ways in literature, newborns, on the other hand, pay the heaviest price. In our series, as in that of Ulander [13], the poor adaptation to extra-uterine life assessed by the Apgar score and the

notion of resuscitation, were not influenced by the delivery route. On the other hand, neonates delivered by the vaginal route, transferred to neonatology and those who died were transferred for prematurity, corroborating the results of Faye Dieme [12]. Perinatal and neonatal mortality rates are difficult to compare between the different studies because of the criteria used and the type of study carried out. Indeed, some works include fetal deaths and/or fetal malformations, the delivery of these fetuses being mainly performed vaginally, their inclusion will tend to overestimate the risks associated with the vaginal route. In addition, numerous studies have found a reduction in mortality and perinatal morbidity in the event of scheduled caesarean section, the reference remaining the randomized trial by Hannah in 2000 [5]. But after a two-year follow-up Whyte [14] concludes that there is no difference between the different modes of delivery, something that was confirmed in the PREMODA study by Carayol [15].

## 5. Conclusion

This study has identified some factors on which actions should be taken to improve the quality of management of breech delivery. These are the primary and secondary prevention of premature births through quality prenatal follow-up, the promotion of the temptation of version by external maneuver before 36 weeks of amenorrhea and the continuation of theoretical lessons and the practice of obstetrical maneuvers based on simulation.

## Conflicts of Interest

All the authors do not have any possible conflicts of interest.

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