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Original Article

Is trial of labor harmful in breech delivery? A cohort comparison for breech and vertex presentations

S. Adjaoud [a,*], R. Demailly [b,e], S. Michel-Semail [a,c], T. Rakza [a], L. Storme [a,d], P. Deruelle [a,d], C. Garabedian [a,d], D. Subtil [a,e]

[a] *Pôle femme–mère–nouveau-né, université Lille, hôpital Jeanne-de-Flandre, CHU de Lille, 59000 Lille, France*
[b] *Obstetric department, Lille Catholic university, Lille Catholic hospitals, 59000 Lille, France*
[c] *Centre hospitalier, 91, avenue Lagache, 59100 Roubaix, France*
[d] *EA 4489, environnement périnatal et croissance, university Lille, 59000 Lille, France*
[e] *EA 2694 santé publique, épidémiologie et qualité des soins, university Lille, 59000 Lille, France*

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ABSTRACT

Introduction. – Planned vaginal delivery in breech presentation is accompanied by an excess neonatal risk that has, however, rarely been compared to that of delivery in vertex presentation. Because of the severity of complications that can occur in long-term follow-up, the risk of asphyxia is of particular concern.

Material and methods. – To assess immediate neonatal status after a planned vaginal delivery of fetuses in breech compared with vertex presentation, we planned a retrospective hospital cohort study of singleton term deliveries from 2000 to 2011. The indicators used to assess neonatal status were: 5-min Apgar score < 7, acidosis, both moderate ($pH < 7.15$) and severe ($pH < 7.0$), asphyxia ($pH < 7.0$ and base deficit ≥ 12.0 mmol/L), transfer to the neonatal intensive care unit (NICU), and in-hospital neonatal death.

Results. – Compared with 43,595 trials of vaginal delivery in vertex presentation at term during the 12-year study period (93.8% of all vertex presentations), the 665 breech deliveries for which planned vaginal delivery was planned (43.2% of all breech presentations) had a quadrupled risk of severe acidosis (ORa 4.3 [2.2–7.5]), but no increase in the risk of asphyxia (ORa 0.7 [0.1–3.0]), NICU transfer (ORa 0.8 [0.4–1.3]) or in-hospital death (ORa 1.3 [0.1–6.0]). Moreover, compared with the 876 planned cesareans, the risk of severe acidosis in the 665 trials of vaginal delivery in breech presentation was four times higher (OR 4.3 [2.3–4.7]), but we observed no increase in neither asphyxia nor other risks studied.

Conclusion. – In our hospital, planned vaginal delivery is safe for breech presentations because it is associated with an increase of severe acidosis but not asphyxia.

Introduction

In breech presentation at term, since the Term Breech Trial showed an excess of risk in trial of labor [1], prophylactic cesarean deliveries of fetuses have become routine in many countries [2–4]. Several recent cohorts have also found an increased risk of neonatal morbidity and mortality associated with trials of vaginal delivery for breech presentations [5–9]. This excess risk was recently confirmed in a meta-analysis of observational studies [10]. Nevertheless, the level of risks is still under debate as it could be related to the delivery conditions [11,12], and the attempted vaginal delivery in breech presentation is still possible if these conditions are met [13–15]. Recently, Behran and Haileamlak recommended that the perinatal risks of planned vaginal delivery be compared for breech and vertex presentations, as this excess risk may be both associated with the mode of delivery (vaginal vs. cesarean delivery) and with the presentation itself (breech vs. vertex) [10].

Few studies have compared neonatal prognosis for trials of vaginal delivery according to presentation [16–19]. Only one of them looked at pH measurements at birth, although it is the only way to assess newborn status with objectivity. It found that the risk of neonatal acidosis associated with vaginal delivery of breech presentation increased, although the authors considered the level was acceptably low [16]. This study did not, however, differentiate acidosis and asphyxia, that is essential because only asphyxia is associated with poor long-term neurological outcome [20–22].

* Corresponding author at: université Lille–Nord de France, hôpital Jeanne-de-Flandre, 1, rue Eugène-Avinée, 59037 Lille cedex, France.
E-mail address: soniaadjaoud@hotmail.com (S. Adjaoud).

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To assess the role of the presentation in the prognosis for planned vaginal delivery, we compared immediate neonatal status — especially acidosis and asphyxia — after a planned vaginal delivery for fetuses in breech and in vertex presentations.

Material and methods

This retrospective study examined files of women in our university hospital maternity ward with neonatal intensive care unit from 1st of January 2000 to 31st of December 2011. Women were included if they had given birth during the study period to a singleton child at term, in either breech or vertex presentation. Multiple pregnancies, medically indicated terminations of pregnancy, and in utero deaths were excluded from the study.

A written protocol has governed the delivery of breech presentations in our department since 2004 [23]. It states that a maternal CT pelvimetry has to be undergone near 37 weeks of gestation in case of refusal or failure of breech external version. A vaginal delivery may be attempted when:

- the biparietal fetal diameter has been compared with the maternal CT pelvimetry data (median conjugate–biparietal diameter $\geq$ 15 mm, median transverse diameter–biparietal diameter $\geq$ 25 mm, and interspinous diameter–biparietal diameter $\geq$ 0);
- flexion of the fetal head has been verified at the onset of labor;
- the woman's has provided informed oral consent.

We retrospectively extracted maternal and neonatal data for all the mother/child pairs included in the study from the information entered into our computerized database after each birth. For the mothers, this included age, obstetric history, type of onset of labor, and mode of delivery. All women who had a cesarean at the beginning of labor because they went into labor before their planned prelabor cesarean was performed were classified in the same group as those with prelabor cesareans — that is, they were excluded. Data recorded about newborns included the Apgar score, the arterial pH and base deficit, both of which were measured on the umbilical cord immediately after birth, transfer to the neonatal intensive care unit (NICU), and death during hospitalization. Moderate acidosis was defined as an arterial pH $<$ 7.15 and severe acidosis by a pH $<$ 7.0. Asphyxia was defined by the combination of arterial pH $<$ 7.0 and a base deficit $\geq$ 12.0 mmol/L [20]. The French Ethics Committee for Research in Obstetrics and Gynecology (CEROG) approved this study.

The analysis compared neonatal outcomes according to presentation by adjusting the results — by logistic regression — on the differences observed between groups in univariate analysis. We planned, should we find an excess risk associated with breech presentation, to assess whether cesarean delivery was potentially protective. The data were recorded and analyzed with Epi Info software (Version 3.1, Epidata Association, Denmark). The Chi^2 test was used to test comparisons of percentages. The data for any groups with especially few subjects were reorganized (and the cells pooled), and the comparisons tested with Fisher's exact test. The Kruskal-Wallis nonparametric test was used to compare means. Percentages are reported between parentheses, and means with the standard deviation of the distribution. Differences were considered significant when the P-value $<$ 0.05.

Results

There were 56,027 deliveries in our maternity ward during the study period (Fig. 1). After excluding multiple pregnancies (3.1%), preterm births (before 37 weeks) (11.1%), transverse presentations (0.3%), and in utero deaths or medically indicated terminations of pregnancy (0.2%), we were able to include 47,996 deliveries of live born term singleton infants, whatever the type of delivery: 1541 of them were in breech presentation (3.2%) and 46,455 in vertex presentation.

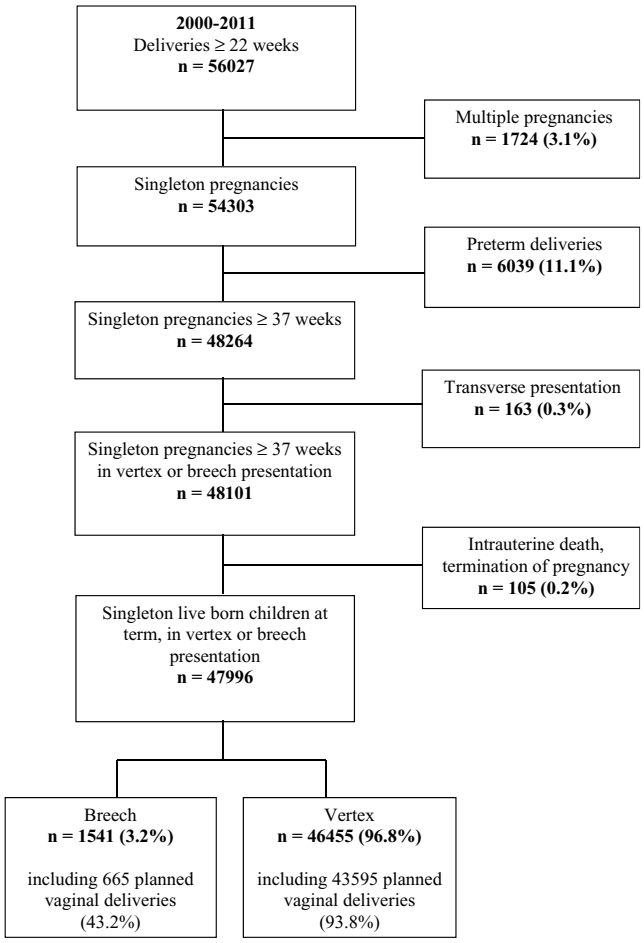

Fig. 1. Flow Chart.

Table 1 describes the women's and newborn characteristics according to presentation (breech or vertex), whatever the mode of delivery. Women with fetuses in breech presentation, compared with vertex, were more often nulliparous or had previously had a cesarean delivery. A planned vaginal delivery occurred in only 43.2% of breech, allowing a vaginal delivery in 36.4% of breech presentations (versus 93.8% and 86.2% of vertex). The rate of these trials for breech presentations increased regularly from 30.2% in 2000 to 59.0% in 2011, allowing a vaginal delivery from 22 to 50% of

Table 1
Characteristics of mothers and newborns according to presentation during the study period, whatever the mode of delivery.

	Breech, n = 1541	Vertex, n = 46455	P
Maternal age (years)	29.5 ± 5.2	29.6 ± 5.5	0.53
Gestational age (weeks)	38.8 ± 1.2	39.3 ± 1.2	< 0.001
Nulliparous women	876 (57.0)	20444 (44.5)	< 0.001
Previous cesarean	207 (13.4)	5231 (11.3)	< 0.001
Planned vaginal delivery	665 (43.2)	43595 (93.8)	< 0.001
Induction of labor	107 (6.9)	9418 (20.3)	< 0.001
Cesarean section during labor	104 (6.7)	3540 (7.6)	0.20
Vaginal delivery	561 (36.4)	40055 (86.2)	< 0.001
Birthweight (g)	3200 ± 470	3350 ± 470	< 0.001
Birthweight < 2500 g	96 (6.2)	1358 (2.9)	< 0.001
Umbilical artery pH	1439 (93.4)	42355 (91.2)	0.01