Acid-base balance in vertex and breech presentation neonates after elective cesarean delivery at term

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Apgar scores, umbilical blood pH, and bicarbonate levels are generally lower and partial pressure of carbon dioxide (pCO₂) levels are higher for vertex vaginal deliveries compared with vaginally delivered breech neonates [1]. Although elective cesarean delivery might improve the outcome for breech presentation [2], it is not clear whether a different metabolic status and perinatal outcome should be expected in breech and vertex presentation neonates delivered by elective cesarean.

We compared all singleton pregnancies with breech presentation neonates delivered by elective cesarean at term with a control group of singleton pregnancies with vertex presentation neonates delivered by elective cesarean at term between January 2003 and March 2006. The control group was comprised of women with 1 or 2 prior elective cesarean deliveries as an indication for the index elective cesarean, and primigravidae who requested an elective cesarean. Women with maternal or fetal conditions such as diabetes, hypertension or intrauterine growth restriction were excluded. The women in the study were matched for maternal age, pregnancy week at delivery, and parity. The perinatal outcome measures were birth weight, Apgar scores at 1 and 5 minutes, and umbilical cord acid-base balance.

There were 404 women in the breech presentation group and 1007 in the vertex presentation group. The mean age, gravidity, and parity of the women were significantly different between the breech and vertex groups (33.5 years vs 31.8 years, 2.95 vs 2.19, and 1.26 vs 0.64, respectively; \( P<0.001 \)). Importantly, there were no differences in Apgar scores (1 min: \( -9.1 \pm 0.3 \), 5 min: \( -9.3 \pm 0.3 \) vs 1 min: \( -9 \pm 0.35 \), 5 min: \( -9.2 \pm 0.2 \), respectively) or umbilical arterial and venous pH levels between the

References


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breech and vertex neonates (7.25±0.69 vs 7.26±0.7 and 7.33±0.05 vs 7.33±0.06, respectively), and no difference in the base excess (−2.8±2 vs −2.9±2, respectively).

Vaginal breech deliveries are associated with an increased risk of lower umbilical pH and adverse neonatal outcome [1,2]. This might be a direct effect of prolonged compression on the umbilical cord or some other feature during delivery [2]. Alternatively, there might be other undetermined in utero factors that have an impact on blood umbilical gases associated with breech presentation regardless of the route of delivery.

We sought to eliminate the process of active labor as a factor that influences the umbilical acid base status by comparing umbilical gases and Apgar scores of neonates delivered by elective cesarean in breech or vertex presentation, which showed that there was no difference in pH levels.

We speculate that lower Apgar scores and pH detected in term breech presentations should be attributed to the process of labor and delivery and not to other in utero factors.

References


Iodine intake in pregnancy

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Iodine is an essential micronutrient required for thyroid hormone biosynthesis. The recommended daily adult intake is 150 μg, increasing to 220–300 μg for pregnant and lactating women. Urinary iodine concentration (UIC) is an accurate indicator of iodine intake because more than 90% is excreted over a 24-hour period. The World Health Organization, United Nations Children’s Fund, and the International Council for the Control of Iodine Deficiency Disorders established that for a given population, the appropriate UIC in clinically healthy pregnant women should be 150–249 μg/L [1,2].

Iodine deficiency disorders (IDDs) are implicated in several diseases [3]. Despite iodine prophylaxis programs in many countries, iodine deficiency is still a significant public health concern [4].

Following the introduction of a salt iodization program (30 mg/Kg of salt) in Italy in 2005, we wanted to investigate whether the increased iodine requirement during pregnancy is being met in an urban area of Rome. Between January 2007 and March 2008, 124 clinically healthy pregnant women were enrolled to evaluate UIC in spot urine samples collected in the morning. The mean age of the women was 32 years, and mean body mass index (BMI, calculated as weight in kilograms divided by height in meters squared) was 25.3±2.6. Fifty-seven women were in the first trimester of pregnancy, 34 in the second, and 33 in the third. A control group of 145 age-matched healthy nonpregnant women (mean age 30 years; mean BMI 24.2±2.4) was also enrolled. All participants were resident in the urban area of Rome and had no restrictions on iodized salt intake. Informed consent was obtained from each participant.

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Fig. 1. Mean urinary iodine concentration (UIC) in 145 clinically healthy age-matched nonpregnant women and 124 clinically healthy pregnant women. The differences between the groups were analyzed using the t test (P<0.01).