HIGHER RISK OF LOW BIRTH WEIGHT AND MULTIPLE NUTRITIONAL DEFICIENCIES IN NEONATES FROM MOTHERS AFTER GASTRIC BYPASS: A CASE CONTROL STUDY

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Introduction

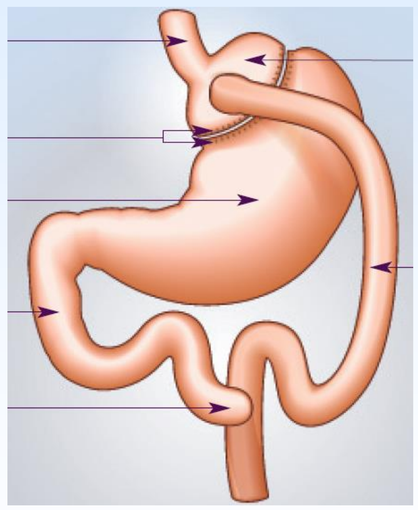
Observational studies of the effect of bariatric surgery on pregnancy outcomes suggest that obstetric outcome is improved ; however, nutritional deficiencies in the mothers are common despite dietary guidance and micronutrient supplementation.
The aim of this prospective study was to compare the clinical characteristics as well as the nutritional profiles in the cord blood of 56 newborns born to mothers after Roux-en-Y gastric bypass (GBP, figure A) and 56 newborns born to non-obese mothers after a normal pregnancy (control), in the Obstetrics Department of Angers University Hospital.

Methods

■Study participants

Women followed in the Obesity Specialized Care Center in Angers who had given birth after Roux-en-Y gastric bypass (GBP) for severe obesity were eligible for the current study. The surgery had been performed between October 2005 and July 2008, and 56 GBP women gave birth to a single newborn between 1 March 2008 and 31 October 2012 in the Obstetrics Department of Angers University Hospital. During the same period, healthy non-obese pregnant women with normal pregnancies followed in the Obstetrics Department were matched for age, parity and smoking habits and were asked to participate in the study, on the basis of one control per patient. They did not have preeclampsia, diabetes or hypertension, denied the use of any illegal substances, and had no complications during pregnancy or labor: 56 gave birth to a single newborn.

A)



After surgery, the women were followed in the Nutrition Unit of Angers University Hospital every 6 months for clinical and nutritional assessment, then monthly at the onset of pregnancy.
They took daily supplements : calcium, iron, zinc, copper, manganese, vitaminA, B1, B2, B5, B6, B8, B9, B12, C, D, E, PP

■Maternal and neonatal biological assessments at birth

- Mother (venous blood) et newborn (cord blood) :
- Blood cell count, serum electrolytes, prothrombin ratio, activated pTT ratio, iron, zinc, calcium, phosphorus, magnesium, vitamins, IGF 1, IGF BP 3, ostéocalcin, leptin, insulin, PTH

Findings

Results of clinical and biological data for newborns,
56 in each group are shown in Table 1 and 2

TABLE 1	GBP	Control	p
BMI before pregnancy (kg/m2)	30,1 ± 6	23,3 ± 5,8	<0,01
Weight gain during pregnancy (kg)	9,8 ± 9,6	12,7 ± 6,1	0,07
Cesarean section (%)	29	4	<0,01
Birth Weight (kg)	3.00 ± 0.57	3.35 ± 0.43	<0,01
Hypotrophy (%)	23	3,6	<0,01
Macrosomia (%)	7	9	NS
Birth lenght (cm)	48 ± 3	50 ± 2	0,02
Breastfeeding (%)	22	51	<0,01

TABLE 2	GBP	Control	p
Calcium (mmol/l)	2,55 ± 0,18	2,63 ± 0,14	0,014
Zinc (mg/l)	0,85 (0,72-0,92)	1,36 (0,81-0,96)	0,015
Vitamin A (µg/l)	185,8 ± 63,2	226,5 ± 59,9	<0,01
IGF1 (ng/ml)	56,6 ± 36	74 ± 31,2	<0,01
Leptin (ng/ml)	5,1 (3,24-8,7)	8,3 (5,37-12,1)	0,02

Conclusion

We have shown here that maternal gastric bypass was associated with lower birth weight and an increased risk of small for gestational age neonates, as well as with several vitamin and trace element deficiencies in the mothers and neonates despite careful maternal supplementation and follow-up. The long-term consequences of the restricted fetal growth, as well as the deficiencies, remain to be determined and indicate the need for follow-up of these infants.

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