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Original Article

Pregnancy outcomes in relation to different types of diabetes mellitus and modes of delivery in macrosomic foetuses in Bahrain

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الملخصا

أهداف البحث: إن أسلوب توليد الحوامل من مرضى السكري مختلَف عليه. صُممت هذه الدراسة بغرض تقييم الأنماط المختلفة لتوليد الأطفال كبار الحجوم بسبب ارتفاع معدل انتشار داء السكري في البحرين.

طرق البحث: تم إجراء هذا التحليل الاستعادي على الأمهات اللواتي أنجبن أطفالا ذوي أوزان ≤ ٤.٠ كغم من عام ٢٠٠١م إلى عام ٢٠١١م في مستشفى قوة دفاع البحرين. تم تسجيل البيانات المتعلقة بعمر ووزن وأسلوب التوليد والإصابة بداء السكري من عدمه ومدة الحمل وعدد الولادات السابقة. كان المستخرج الرئيس؛ تأثير داء السكري على قرار السماح بالولادة المهبلية للأطفال كبار الحجوم. وشملت المستخرجات الأخرى عدم نجاح محاولة التوليد الطبيعي، وعدد الولادات السابقة، وأثر عمر الأم، ووزن الجنين على قرار محاولة التوليد الطبيعي، ومضاعفات حديثي الولادة المرتبطة بالولادات المهبلية.

النتائج: نسبة المواليد كبار الحجوم في فترة الدراسة كانت ٢.٢٪ من بين المواليد. لوحظت الإصابة المسبقة بداء السكري في ٣.٩٪ من الخاضعات للدراسة. اختلفت نسبة إجراء عمليات قيصرية مجدولة من ١٢.٥٪ في الأمهات اللواتي لا يعانين من داء السكري إلى ٥٠٪ في اللواتي يعانين منه. أما بالنسبة لإعطاء فرصة ولادة طبيعية، فقد أتم حوالي ٧٠٪ من المرضى اللواتي يعانين من داء السكري ولادة طبيعية ناجحة. كان احتمال الحاجة إلى إجراء اضطراري أقل في اللواتي سبق لهن الولادة مقارنة باللواتي لم يسبق لهن الولادة، إلا أن احتمال القيصرية المجدولة كان متساو بينهما. لم يكن لعمر المريضة ولا لوزن الجنين أي أثر على نجاح محاولة الولادة المهبلية.

الاستنتاجات: كان المعتاد في السابق الإكثار من عرض العملية القيصرية المجدولة على الحوامل ذوات الأجنة كبار الحجم في حال كن يعانين من داء السكري. غالبية المرضى الخاضعات لمحاولة الولادة الطبيعية أتممن ذلك بالقليل من المضاعفات.

الكلمات المفتاحية: الأجنة كبار الحجم؛ تعسر ولادة الكتف؛ العملية القيصرية؛ داء السكري؛ سكري الحمل

Abstract

Objectives: The mode of delivery in diabetic patients is debatable. This study was designed to assess the pattern of delivery of macrosomic babies with a high prevalence of diabetes mellitus in Bahrain.

Methods: This retrospective analysis was conducted on mothers who delivered babies weighing ≥4.0 Kgs from 2001 to 2011 at Bahrain Defence Force Hospital. Data regarding patients' age, weight, mode of delivery, diabetic status, gestational age and parity were recorded. The main outcome was the effect of diabetes mellitus on the decision to allow vaginal delivery for macrocosmic babies. Other outcomes were failed trial of labour, parity, maternal age and foetal weight on the trial of labour and neonatal morbidity associated with vaginal births.

Results: The incidence of macrosomic babies was 2.2% of total births. Pre-existing diabetes mellitus was 3.9% of the study cohort. The rate of elective Caesarean section increased from 12.5% in non-diabetic mothers to 50% in patients with pre-existing diabetes. In cases of allowing a trial of labour, approximately 70% of patients with pre-existing diabetes had successful vaginal delivery. Patients with a previous delivery were less likely to undergo emergency procedures, but had the same probability for elective Caesarean compared with primigravida. Patient's age and foetal weight had no influence on successful trial of vaginal birth.

Conclusions: There was a trend to offer more elective Caesarean sections in patients with macrosomic babies in the presence of pre-existing diabetes. The majority of

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patients who were offered a trial of labour achieved vaginal delivery with minimal morbidity.

Keywords: Caesarean section; Diabetes; Foetal macrosomia; Gestational diabetes; Shoulder dystocia

Introduction

Macrosomia is defined by the American College of Obstetricians and Gynecologists (ACOG) as a birth-weight over 4000 g with no correlation to gestational age.[1] Macrosomia affects approximately 3–15% of all pregnancies. The diagnosis can only be confirmed retrospectively after delivery of the neonate.[2] Genetic, ethnic and racial factors are associated with foetal macrosomia.[3] Pre-gestational diabetes results in foetal macrosomia in 40% of pregnancies.[3]

Furthermore, when patients have gestational diabetes, the risk of having macrosomic babies increases to 50%.[4] A KSA study was conducted from 2004 to 2006 and confirmed the prevalence of macrosomic babies to be 5.6% using the same birth weight definition.[4] Another recent large birth cohort Kuwaiti study reported macrosomia in 6.1% of the cohort, and 23.0% of babies were large for their gestational age.[5]

Macrosomia can cause numerous perinatal and maternal complications.[6] Large babies can be traumatized during vaginal birth, especially those with shoulder presentation. Even with an uncomplicated delivery, macrosomic babies, especially those born to diabetic mothers, have an increased incidence of admission to intensive care infant units to regulate their blood sugar levels and electrolytes. Macrosomia can also lead to maternal complications, such as prolonged labour, Caesarean delivery (CSD), labour assisted with oxytocin, postpartum haemorrhage, infection, serious perineal tears of the 3rd and 4th degree, thromboembolic events (DVT) and anaesthetic accidents.[7]

To prevent any chance of birth trauma to mother and baby, some authors suggested induction of labour before 40 gestational weeks, others recommend routine Caesarean section (CS) for the delivery of foetuses >4500 g.[8] Al-Haddabi's group reported that among 7367 deliveries in a three-year study conducted in the Department of Obstetrics and Gynecology, Sultan Qaboos University Hospital, Sultanate of Oman, the CS rates were increased in the macrosomic group compared with the general group (25.8% vs. 13.1%).[9] Ultrasound techniques are not very reliable in detecting and diagnosing macrosomia.[10]

Unfortunately, there are still no clear guidelines governing the management of macrosomia in diabetic patients, and this issue should be given serious consideration due to its consequence.

The present retrospective analysis aims to assess the mode of delivery in patients with large babies associated with different types of diabetes. The analysis also assessed other factors that might influence the clinical decision and final outcome.

Materials and Methods

Data were collected retrospectively at the BDFMH. Patients who gave birth to babies weighing ≥4.0 Kgs were included. Patients' birth records and birth registry were reviewed between 2001 and 2011. The mode of delivery was recorded in the form of vaginal, emergency lower segment Caesarean section (LSCS) and elective LSCS. Cases were divided into three groups: non-diabetic, gestational diabetes and pre-existing diabetes. All pregnant women included in the study were screened with the 50-g glucose tolerance test at approximately 20 weeks of gestation. Patients who screened positive were subject to a full glucose tolerance test. Patients with one abnormal reading were considered to be glucose intolerant. Patients with two abnormal readings were confirmed to have gestational diabetics. In our analysis, BDF Hospital patients with glucose intolerance were included in the gestational diabetic group. All patients with pre-existing diabetes were either induced or had elective Caesarean before reaching full term. Patients with gestational diabetes were offered delivery at term. Failure to progress was diagnosed based on Friedman's curve.

Patient's age, weight, gestational age at delivery, parity and 3rd and 4th degree tears were recorded. Shoulder dystocia was diagnosed when gentle traction failed to deliver the shoulder and additional obstetric manoeuvres were required. Birth trauma, including Erb's palsy and clavicular/humeral fractures in our birth registry, were recorded.

The main outcome was the effect of DM on the decision to allow macrosomic baby vaginal delivery. Other outcomes included the rate of emergency LSCS with trial of labour, effect of previous delivery/maternal age/foetal weight on the trial of labour and neonatal morbidity associated with vaginal birth. Data were analysed using the StatsDirect statistical package. Two-sided Mann–Whitney U tests were used to compare the medians between two groups, and two-sided unpaired t tests were used to compare the means between two groups. Chi square tests were used in crosstabs, and Fisher–Freeman–Halton exact test was employed in crosstabs when any cells had an expectation of less than 5. P-values of less than 0.05 were considered statistically significant.

Results

The incidence of macrocosmic babies represented approximately 2.2% of all recorded deliveries (811 out of 36,827 cases). Approximately 78% (634/811) of patients did not have gestational or pre-existing diabetes. Gestational diabetes was noted in 18% (145/811) of patients, and pre-existing diabetes was only found in 4% (32/811).

Thirty-four patients with glucose intolerance were added to the gestational diabetes group. Approximately 25% of the patients with gestational diabetes (26/111) were managed with insulin during pregnancy, whereas the remaining majority (76.6%) were managed with diet. Three-fourths of patients with pre-existing diabetes (24/32) were type 1, and