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Original Article

Is gestational hypertension beneficial in twin pregnancies?

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ABSTRACT

Objectives: Hypertensive disorders of pregnancy are commonly associated with impaired foetal growth. However, some studies observed that gestational hypertension in twin pregnancy could be beneficial for foetal growth. The aim of this study is to investigate the influence of gestational hypertension on neonatal birth weight among twin pregnancies.
Study design: This is a retrospective study about the comparison of 196 hypertensive twin pregnancies to 912 normotensive ones, who gave birth in the teaching hospital "A. Gemelli" in Rome from 1980 to 2006.
Main outcome measures: Birth weight, inter-twin weight discordance and rate of small for gestational age neonates in the first and second twin.
Results: Birth weight, inter-twin weight discordance and rate of small for gestational age neonates were similar between the two groups. In the normotensive group, the discordance >25% was associated with lower gestational age at the delivery ($p < 0.00001$), data not observed in the hypertensive group. The rate of pregnancies with second twin small for gestational age rose while paralleling the degree of the discordance in both groups.
Conclusion: Gestational hypertension in twin pregnancies, if compared to normotensive ones, is not detrimental for foetal growth.

Introduction

Hypertensive disorders are considered among the most common disease in pregnancy, being the main cause of maternal, foetal and neonatal morbidity and mortality in developed countries. The incidence of hypertensive disorders in singleton pregnancies is around 3–5% in Italy, including 1% of preeclampsia [1]. However, the incidence of hypertensive disorders in twin pregnancies is much greater [2–6]. Recent data report that the incidence of gestational hypertension and preeclampsia is double (12.9% vs. 6.3%) and three times greater (12.7% vs. 4.9%) respectively, in twin pregnancies compared to singleton ones [7]. Furthermore, singleton and twin pregnancies complicated by preeclampsia are more frequently characterized by low birth weight and small for gestational age (SGA) neonates compared to normotensive pregnancies [2,8,9]. So far, few studies analyzed the effect of gestational hypertension not complicated by preeclampsia on neonatal outcomes among twin pregnancies. Already in 2000, Sibai et al. [2] demonstrated that twin pregnancies complicated by hypertension had a better outcome as compared with both preeclamptic and normotensive twin pregnancies. A more recent Canadian study [7] on 102,988 twin pregnancies compared to 5,523,797 singletons showed that gestational hypertension in twin pregnancies had

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overall better neonatal outcomes in terms of rate of preterm delivery, intra-uterine growth restriction, neonatal death and APGAR score, compared to those of singleton pregnancies. The elevated blood pressure in twin pregnancies, in fact, may be a mere effect of a physiologic response to the need for additional nutrients provided with blood [7]. Since the role of gestational hypertension on birth weight in twin pregnancy has not been previously investigated in Italian women, our study aims to analyze the effect of gestational hypertension on neonatal birth weight among twin pregnancies.

Methods

Study participants

A 27-year (from January 1, 1980 to December 31, 2006) retrospective cohort study involving 1273 consecutive twin pregnancies was conducted at the Department of Obstetrics and Gynaecology at the teaching hospital "A. Gemelli" in Rome. Cases consisted of twin pregnancies with gestational hypertension, defined as a diastolic blood pressure $\geqslant$90 mmHg on two or more consecutive occasions, at 6 h apart, developing after 20 weeks of gestation in a previously normotensive woman. Non-cases were twin normotensive pregnancies. Blood pressure was taken with a standard mercury sphygmomanometer, using phases one and five of the Korotkoff sounds before delivery for systolic and diastolic blood pressure, respectively, and recording with the patient in a semi-recumbent position.

Women with preeclampsia, HELLP (haemolytic anemia, elevated liver enzymes, and low platelet count) syndrome, preeclampsia on chronic hypertension, chronic hypertension, major foetal malformations, aneuploidies, type 1 diabetes, foetal hydrops, gestational diabetes, maternal chronic disease and twin-twin transfusion syndrome were excluded from the study.

The indications for planning delivery among hypertensive twin pregnancies were: presence of foetal distress as indicated by foetal heart rate recording, oligo-anhydramnios, abnormal Doppler velocimetry, premature rupture of membranes, or any other obstetric indication. The finding of intrauterine foetal discordance was not an indication for planned delivery if not associated with other signs of foetal distress. Corticosteroids were used to accelerate foetal lung maturation in both hypertensive and normotensive twin pregnancies, when appropriate.

Data collection

Retrospective data collection revealed that among 1273 twin pregnancies with alive twin births: 196 met the case definition, 912 were normotensive twin pregnancies, and 165 twin pregnancies were excluded because of the above mentioned conditions. Information were collected from study subjects by extracting data from medical chart records and entered into a structured database. The following data were collected: prenatal care, duration of gestation (weeks), previous medical history, intrapartum care, delivery and neonatal outcome. Data on maternal age, height, weight before pregnancy, rate of nulliparas, week of delivery, rate of preterm delivery and of Caesarean section, twins' birth weight, birth weight discordance, birth order and sex combination were also collected. Small Gestational Age (SGA) was defined as a birth weight lower than 10th percentile according to a national standard curve for singleton births [10]. Twin A was defined as the first born, and twin B as the second one. Inter-twin birth weight discordance was reported as measure of weight discordance. Signed percentage weight discordance (SPWD) was defined as (twin A weight − twin B weight) × 100/the heavier twin and expressed as a signed percentage. SPWD indicated which twin was heavier according to delivery order. Total birth weight was the sum of twin A plus twin B. The twin B/twin A SGA rate ratio was calculated to allow a direct comparison of SGA frequencies between the two groups of twin pregnancies.

Statistical analysis

The χ^2 test or Fisher's exact test were used to compare frequencies between categorical variables, where appropriate. The comparison of averages for continuous variables was carried out by means of Student's *t*-test or Mann–Whitney according to data distribution and values are presented as mean ± standard deviation (SD). To evaluate the distribution of SPWD among hypertensive and normotensive twin pregnancies, it was arbitrarily categorized into four degrees of discordance (>25%, 25–16%, 15–11% and $\leqslant$10%) and the χ^2 test was then used.

In order to evaluate if week of delivery might influence SPWD considered as a dependent variable, a linear regression analysis was performed using Spearman's coefficient (r). The goodness of fit was assessed by means of R^2 coefficient. To visually look at the strength of the relationship between the two variables, a scatter plot was obtained.

The effect of duration of gestation on SPWD degrees and SGA was assessed by using the Kaplan–Meier non parametric method and the differences were tested by log-rank test. Statistical analyses were carried out using STATA software version 10.1 (Stata Corporation, College Station, TX) and were two-sided. Statistical significance was set at a p value of $\leqslant$0.05.

Results

Table 1 shows main maternal clinical characteristics and pregnancy outcome among 196 hypertensive and 912 normotensive twin pregnancies, while Table 2 details the birth weight features in the compared groups. No significant differences were observed between the groups, both for mothers' clinical features and twin outcomes. The distribution of the four degrees of SPWD was not significantly different (but borderline) between the two groups of twin births ($p = 0.07$, Table 2). The rate of SGA was increased in the second twins in both groups, in comparison to that of the first twins.

Fig. 1 shows a significant correlation between SPWD and the week of delivery in hypertensive ($r = 0.17$; $p = 0.021$), and normotensive pregnancies. ($r = 0.07$; $p = 0.036$).