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COMPARATIVE STUDY OF PERINATAL OUTCOME OF GROWTH RESTRICTED FETUSES IN HYPERTENSIVE MOTHERS VERSUS OTHER CAUSATIVE FACTORS

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ABSTRACT

From July 1998 to November 1999 we have followed up 15712 deliveries (12044 vaginal and 3668 cesarean section) in our hospital. Among these, 182 cases were primarily diagnosed as intrauterine growth restriction (IUGR) and 248 pregnancies were complicated with hypertensive disorders. In these two groups we have investigated the outcome of the neonates. Neonatal weight under the 10th percentile in these two groups was 1.63% and 36.3% and perinatal mortality was 4.4% and 6.1% respectively ($p<0.05$), due to the much higher incidence of IUGR and greater perinatal mortality in hypertensive pregnant women as compared with the general obstetric population. We conclude that it is valuable to manage close observation in all cases of pregnancy induced or aggravated hypertension.
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INTRODUCTION

Although intrauterine growth restriction (IUGR) is commonly diagnosed in obstetrics and carries an increased risk of perinatal morbidity and mortality, it remains a difficult entity to discuss and manage. Identification of IUGR is crucial because proper evaluation and management can result in a favorable outcome. Certain pregnancies are at high risk for growth restriction, although a substantial percentage of cases occur in the general obstetrics population. Accurate dating early in pregnancy is essential for diagnosis of IUGR. A lag of 4 cm or more in uterine height suggests IUGR.

One of the problems in dealing with IUGR is its definition. Infants who have not achieved full growth in utero would be described as growth restricted. However there is no real way to reliably measure individual growth potential. We use the term small for gestational age (SGA) in a fetus that has failed to achieve the threshold weight that is usually defined as the 10th, 5th or 3rd percentile, or 2 standard deviations below the population average.Ultrasonography is the gold standard for assessment of size and the amount of amniotic fluid. Growth restriction is classified as symmetric and asymmetric.

MATERIAL AND METHODS

From July 1998 to November 1999, we investigated all of the pregnancies complicated with intrauterine growth restrition (IUGR). From among 15712 deliveries (12044 vaginal and 3368 cesarean section). We divided our cases into two groups. In the first group, IUGR with undefined cause and in the second group, IUGR in hypertensive pregnant mothers. Clinical evaluation and sonographic measurements were performed in all cases. If the sonographic findings and neonatal weight were less than the 10th percentile, the case would be confined to the IUGR group. The birth weight (limited to 2500 g), gestational age at the time of delivery (more or less than 37 weeks), perinatal mortality and frequency of IUGR were compared with the general obstetrics population.

RESULTS

From among 15712 pregnancies, we have found 182

cases primarily diagnosed as IUGR due to undefined causes (first group), and we also studied the incidence of IUGR in 248 hypertensive pregnant mothers (2nd group). Birthweight under the 10th percentile was 1.63% (167 cases in the general obstetrics population) and 36.3% (90 cases in 248 hypertensive mothers) respectively (Fig.1). The incidence of IUGR in hypertensive mothers was 22 fold greater than the general obstetrics population ($p<0.000$).

Perinatal mortality rates were 4.4% and 6.1% (Fig. 2) in the two groups respectively ($p<0.05$).

Birthweight less than 2500 g was observed in 86.8% and 30.5% of the two groups respectively (Fig. 3), weight below 2500 g was 3-folds more common in the first group ($p<0.000$).

Newborn weight under the 10th percentile was 91.7% and 48.3% (Fig. 4) in the two groups respectively, nearly twice in the first group ($p<0.001$). There is a statistical difference in the two study groups.

Gestational age more than 37 weeks was seen in 80.6% (123in165) and 67.2% (162 in 241) in whom the pregnancy had been terminated. Gestational age under 37 weeks was 19.6% and 32.8% (Fig. 5) in the two groups respectively ($p<0.001$).

Frequency of cesarean section was 38% and 45.4% in the two groups respectively. The rate of cesarean section in our general obstetrics population was 23.3% (Figs. 6&7). There is a statistical difference between the two study groups ($p<0.05$).

Previously we have observed that maternal problems were the cause of more than two-thirds of cases, and similar to the results of other authors in our hospital, pregnancy complicated by hypertension had a much higher rate of obstetrical interventions than the control groups.

DISCUSSION

Fetal growth restriction is the second cause of perinatal mortality followed by prematurity. The incidence of fetal growth restriction varies depending on the population under examination (including geographic location and stan-

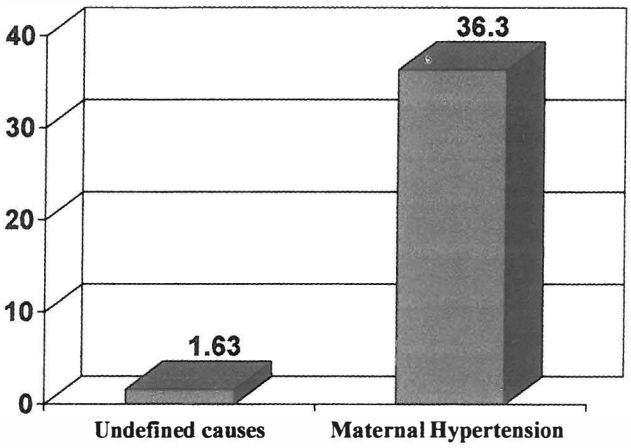

Fig. 1. Newborn weight <10th percentile ($p<0.000$).

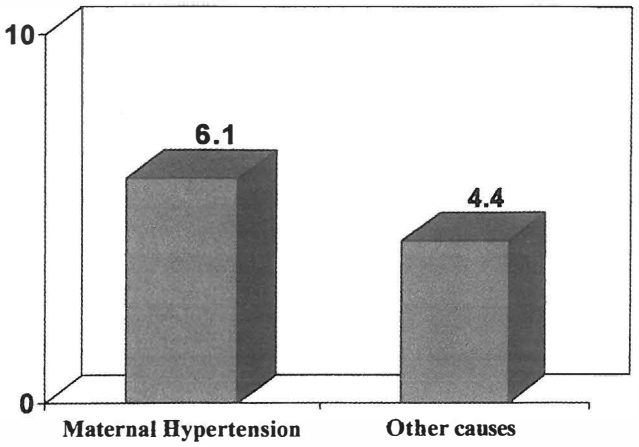

Fig. 2. Perinatal mortality rate (in I.U.G.R. cases) ($p<0.05$).

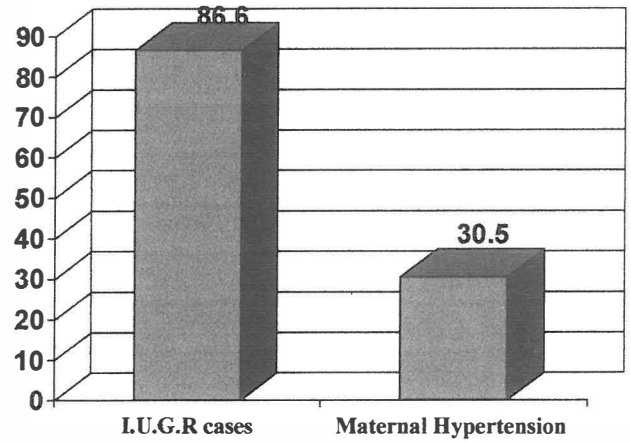

Fig. 3. Neonatal weight <2500 g ($p<0.000$).

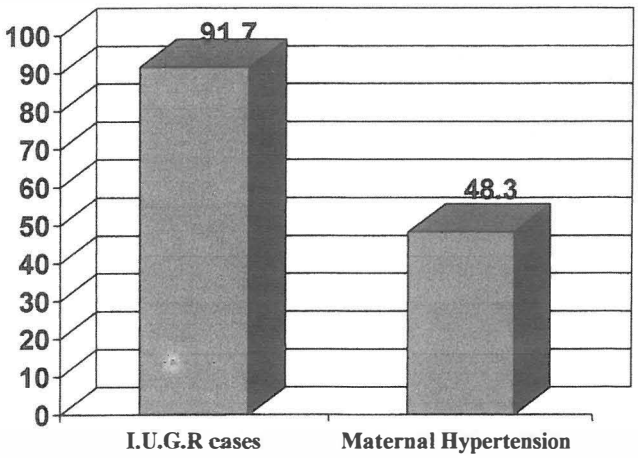

Fig. 4. Neonatal weight <10th percentile ($p<0.001$).

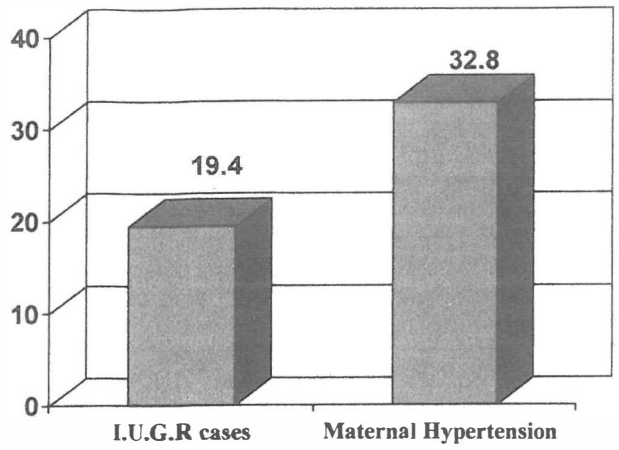

Fig. 5. Gestational age <37 weeks (p<0.001).

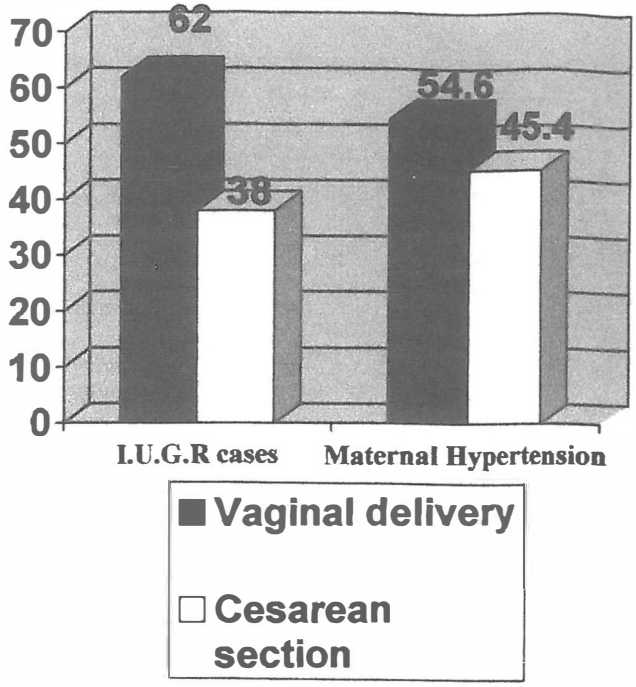

Fig. 6. (p<0.05).

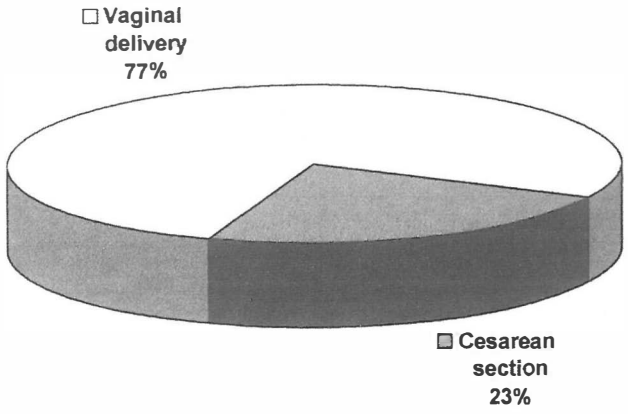

Fig. 7. Total delivery= 15712 (Vaginal delivery= 12044, Cesarean section= 3668).

dard curves used as reference) and is estimated to be approximately 5% in the general obstetrics population.

In assessing prenatal outcome by weight less than 2500g at term, such infants have a perinatal mortality rate 5-30 times more than infants whose birthweight are at the 50th percentile. Infants whose birthweights are less than 1500g have a 70-100 times higher mortality rate. Fetal growth is dependent on genetic, placental and maternal factors. Traditionally, small for gestational age fetuses (SGA) have been categorized as either symmetric or asymmetric in order to identify both etiology and prognosis. In asymmetric IUGR the growth of the head as compared with the rest of the body is proportionally small and occurs early in gestation.

Fetuses who are small for constitutional reason and not pathologically also tend to be in this group. Asymmetrical growth restriction usually refers to the fetuses affected either late in gestation or whom the pathologic process is typical of utero-placental insufficiency.

The management of IUGR must be individualized for each patient. In addition to managing any maternal illnesses a detailed sonogram should be performed to search for fetal anomalies, and karyotyping should be considered to rule out aneuploidy. The management of IUGR must be individualized for each patient. In addition to managing any maternal illnesses, a detailed sonogram should be performed to search for fetal anomalies, and karyotyping should be considered to rule out aneuploidy. The biophysical profile and oxytocin challenge test should be instituted. Doppler velocimetry of the umbilical artery identifies the growth-restricted fetuses at greatest risk for neonatal morbidity, but each of these tests has a relatively high false-positive rate in low risk patients.

Obstetrical management of IUGR varies with differing gestational age of the fetuses and/or etiological aspects. Because of increased risk of intrapartum asphyxia, the fetus should be monitored carefully and continuously during labor. When the diagnosis of IUGR is confirmed, the gestational age is 36 weeks or greater, and the amniotic fluid index is normal, and when the cervix is favorable, the pregnancy should be terminated.

Oligohydramnios at 36 weeks or greater, regardless of the Bishop Score of the cervix, indicates the need for delivery.

Anhydramnios beyond 23-30 weeks of gestation, repetitive late deceleration or a biophysical profile <6 and/or evidence of fetal hypoxia with Doppler studies, and arrest of growth during a 2-3 week interval also indicates that the pregnancy should be terminated.

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REFERENCES

1. Gabbe SG: Intrauterine growth restriction. In: Gabbe SG, Niebyl JR, Simpson JL, Annas GJ, et al. (eds), Obstetrics: Normal and Problem Pregnancies. 3rd ed., New York: Churchill Livingstone, pp. 863-86, 1996.
2. Craigo SD: The role of ultrasound in diagnosis and management of intrauterine growth retardation. Semin Perinatol 18: 292-304, 1994.
3. Creasy RK, Resnik R: Intrauterine growth restriction. In: Creasy RK, Resnik R, (eds), Maternal-Fetal Medicine: Principles and Practice. 3rd ed., Philadephia: Saunders, pp. 558-74, 1994.
4. Fetal growth restriction. In: Cunningham FG, et al, (eds.), William's Obstetrics. 20 th ed., Stanford, Conn: Appleton & Lange, pp. 839-54, 1997.
5. Genbruch U: Assessment of the fetal circulatory state in uteroplacental insufficiency by Doppler ultrasound. Which vessels are the most practicable (opinion). Ultrasound in Obstetrics and Gynecology 8: 77-81, 1996.
6. Golan A, Lin G, Evron S, Arieli S, Niv D, David MP: Oligohydramnios: maternal complications and fetal outcome in 145 cases. Gynecol Obstetrics Invest 37: 91-5, 1994.
7. Manninig FA, Hohler C: Intrauterine growth retardation: diagnosis, prognostication, and management based on ultrasound methods, In: Fleischer AC, et al. (eds), The Principles and Practice of Ultrasonography in Obstetrics and Gynecology. 4th ed., Norwalk, Conn: Appleton & Lange, pp. 331-48, 1991.
8. Markestad T, Vik T, Ahlsten G, Gebre-Medhin M, Skjaeren R, Jacobsen G, et al: Small-for-gestational-age (SGA) infants born at term: growth and development during the first year of life. Acta Obstet Gynecol Scand 165 (Suppl) 93-101, 1997.
9. McCurdy CM Jr, Seeds JW: Oligohydramnios: problems and treatment. Semin Perinatol 17: 183-96, 1993.
10. Nageotte MP, Towers CV, Asrat T, Freeman RK: Perinatal outcome with the modified biophysical profile. Am J Obstet Gynecol 170: 1672-6: 1994.
11. Neerhof MG: Causes of intrauterine growth restriction. Clin Perinatol 22: 375-85, 1995.