

Artigo Original/Original Article

Corionicidade em gravidez gemelar: impacto nos resultados perinatais

Chorionicity in twin pregnancies: impact upon perinatal results

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ABSTRACT

Objective: To evaluate and compare complications in monochorionic and dichorionic twin gestations.

Study design: Retrospective observational study

Population: 323 twin pregnancies managed at our institution between January 2000 and December 2005.

Methods: review of clinical files

Results: There were 108 monochorionic and 215 dichorionic twin gestations. Fetal death occurred in 9 pregnancies – 8 monochorionic and 1 dichorionic ($p=0.01$); discordant growth of 25% or more was present in 52 cases – 26 monochorionic and 26 dichorionic ($p=0.05$); intrauterine growth restriction was found in 42 pregnancies – 22 monochorionic and 20 dichorionic ($p=0.05$). Twin-to-twin transfusion syndrome complicated 8 monochorionic twin gestations. There were 12 cases of congenital abnormalities – 4 in monochorionic and 8 in dichorionic pregnancies. Preterm delivery occurred in 53 cases: 24 monochorionic and 29 dichorionic gestations ($p=0.03$).

Conclusions: Complications were more frequent in monochorionic than in dichorionic pregnancies. Differences between the two groups were significant for fetal mortality, discordant growth, fetal growth restriction and preterm delivery.

Key-words: twin pregnancies; chorionicity

INTRODUCTION

Monochorionic twin pregnancies have an increased risk of serious complications due to imbalance placental vascular sharing between fetuses.

Chorionicity diagnosis by ultrasound, ideally performed before the 14th week of gestation, is crucial for planning

prenatal vigilance, since specific clinical problems can arise in 15-20% of monochorionic twins¹. The more serious complications in monochorionic twins develop between the 17th and 26th weeks of gestation and include: twin-to-twin transfusion syndrome (TTTS); marked growth discordance and fetal brain injury to the surviving twin if the co-twin dies spontaneously.

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The authors aimed to evaluate and compare the complications occurred in monochorionic and in dichorionic twin gestations.

MATERIAL AND METHODS

A retrospective analysis was made and all twin pregnancies managed at our department between January 2000 and December 2005 were reviewed through a data base of twin pregnancies made up of reviewed clinical files of the pregnancies followed in the Outpatient Unit (57.9%) and those with prenatal surveillance in other institutions but with the delivery occurring in our department (48.9%).

Only twin pregnancies with histological confirmation of chorionicity were included, either spontaneous or resulting from assisted reproduction. The following aspects were evaluated and compare between pregnancies: discordant growth (a difference in estimation of fetal weight of 25% or greater), intra-uterine growth restriction, early preterm delivery (birth before the 32 weeks gestation) and occurrence of twin-to-twin transfusion syndrome, whereas congenital abnormalities, perinatal mortality, birthweight, admission of newborns in neonatal intensive care unit (NICU) and their morbidity were evaluated and compare between the fetuses.

Relevant neonatal morbidity was subdivided in respiratory (hyaline membrane disease, chronic respiratory disease), infectious (sepsis, necrotizing enterocolitis), and neurological (intraventricular haemorrhage, leucomalacia).

The statistic methods used to analyse the results were the chi-square test for qualitative variables and the t-student for quantitative ones.

RESULTS

Overall, 345 multiple pregnancies were assessed at our department, with prenatal care starting at the 1st trimester in 94.7% of the cases. Of these, 323 were included, 108 (32.8%) monochorionic and 215 (65.3%) dichorionic.

Of the 323 pregnancies included, fetal death occurred in eight monochorionic (seven due to TTTS

at mean gestational age of 24.6 3.9 weeks and one of unknown cause at 27th week of gestation) and in one dichorionic pregnancy, due to fetal malformation (2.5% vs. 0.3%; $p = .001$).

Discordant growth (TTTS cases not included) was present in 26 monochorionic and in 26 dichorionic pregnancies (24.1% vs. 12.1%; $p = .005$).

Intrauterine growth restriction was found in 22 monochorionic and 26 dichorionic pregnancies (20.4% vs. 9.3%; $p = .005$).

Twin-to-twin transfusion syndrome complicated eight monochorionic twin gestations (7.4%), with a mean gestational age at diagnosis of 24.4 ± 3.6 weeks and resulting in seven fetal deaths.

There were 12 cases of congenital abnormalities: four in the monochorionic (acardic fetus, diaphragmatic hernia, malformation of mandible articulation and oral cleft) and eight in the dichorionic pregnancies (trisomy 21, anencefaly, central nervous system malformation, cardiopathy, duodenal atresia, pulmonary adenomatosis, skeletal malformations and oral cleft): 3.7% vs. 3.7%; $p = .63$.

Delivery occurred before 32 weeks in 53 cases: 24 in monochorionic and 29 in dichorionic gestations (22.2% vs. 13.5%; $p = .034$).

Mean birthweight was 1984 ± 602 g in the monochorionic group against 2277 ± 569 g in the dichorionic group ($p < .0001$).

NICU admission was needed for 81 newborns of the monochorionic and for 125 newborns of the dichorionic gestations (75% vs. 58.1%; $p = .001$).

There were two neonatal deaths (one intrapartum and one due to pulmonary hypertension) in the monochorionic group and eight (one intrapartum, one due to polimalformation syndrome, four due to respiratory problems, one due to meningitis and other due to intraventricular haemorrhage) in the dichorionic group (0.6% vs. 2.4%; $p = .29$).

Neonatal morbidity was (monochorionic vs. dichorionic): neurological (intraventricular haemorrhage, leucomalacia) 1.9 vs. 1.4% ($p = .54$), respiratory (hyaline membrane disease, chronic respiratory disease) 29.4 vs. 21.8% ($p = .08$) and infectious (sepsis, necrotizing enterocolitis) 21.3 vs. 10.7% ($p = .009$).

Table I summarizes the results obtained.

Table I. Results from the study according to the chorionicity and statistic evaluation

	MONOCHORIONIC twin pregnancies	DICHORIONIC twin pregnancies	p value*
N (n; %)	108 (32.8)	215 (65.3)	
Perinatal mortality (n; %)	10 (3.1)	9 (2.8)	.06
Fetal mortality (n; %)	8 (2.5)	1(0.3)	.001
Neonatal mortality (n; %)	2 (0.6)	8 (2.4)	.3
Discordant growth (n; %)	26 (24.1)	26 (12.1)	.005
IUGR (n; %)	22 (20.4)	26 (9.3)	.005
TTTS (n; %)	8 (7.4)		
Congenital abnormalities (n; %)	4 (3.7)	8 (3.7)	.6
Delivery <32 weeks (n; %)	24 (22.2)	29 (13.5)	.03
Mean birthweight (g)	1984 ± 602	2277 ± 569	< .0001
NICU admission (n; %)	81 (75)	125 (58.1)	.001
Neonatal morbidity (n; %)			
Neurological	3 (1.9)	2 (1.4)	.5
Respiratory	47 (29.4)	32 (21.8)	.08
Infectious	23 (21.3)	23 (10.7)	.009

IUGR – intrauterine growth restriction; TTTS – twin-to-twin transfusion syndrome; NICU – neonatal intensive care unit

* a p value <.05 was considered significant

DISCUSSION

The prevalence of twin pregnancies in our study was 1.5%. The overall prevalence of monozygotic twins was 0.5%, similar to that described in other studies (0.3-0.5%)². Monozygotic twins accounted for 28% of the twin pregnancies, which is within the expected incidence of 20-30%².

Monozygotic twin pregnancies are associated with a high perinatal mortality (a risk 3-4 times greater than in dizygotic pregnancies^{3,4}), mostly due to prematurity and placental vascular anomalies¹.

Antepartum death of one of the fetuses may occur in 2.5–5% of twin pregnancies, being associated with significant morbidity and mortality in the surviving co-twin⁵. Our perinatal deaths in monozygotic twins were mostly due to antepartum events, fact also described by Baghdadadi⁶.

The perinatal mortality found in our study (3.1% in monozygotic and 2.8% in dizygotic pregnancies, p = .06), represents a very good result, considering that perinatal death rates of up to 50% in monozygotic twins are described in the literature³. This could be explained by early referral and close fetal surveillance of monozygotic twin pregnancies.

Our incidence of TTTS (7.4%) was slightly lower than the 10-15% described in literature, with some of these cases contributing to fetal monozygotic deaths.

Intrauterine growth restriction (IUGR) is common in monozygotic twins, with severe IUGR occurring in up to 25% of multiple gestations with increased rates in monozygotic pregnancies^{4,7}. In addition to the factors stated above, adverse outcome in monozygotic pregnancies is strongly associated with the high incidence of preterm delivery^{4,5,7}, which was also found in our study, when considering early preterm deliveries (<32 weeks of gestation).

As expected from the higher rates of IUGR, discordant growth and preterm delivery, mean birthweight is usually lower in monozygotic twins when compared to dizygotic.

The neonatal morbidity can be roughly assessed by NICU admission rates, being these generally higher in monozygotic than in dizygotic twins.

In spite of the limitations related to the retrospective observational design of the study, we can conclude that perinatal outcome of twins seems to be influenced by the type of placentation, with monozygotic twin pregnancies characterized by higher fetal mortality and increased incidence of some forms of fetal and

neonatal morbidities, like IUGR, discordant growth, preterm delivery (<32 weeks) and neonatal infections. Early and correct sonographic determination of chorionicity (to identify the twins at risk for TTTS, IUGR, discordant growth, and thus at higher risk for fetal death) and early referral to a tertiary health care centre (in order to ensure antenatal, intrapartum and postnatal care), can therefore be important for improvement of the perinatal outcome in twin pregnancies^{7,8}.

REFERENCES

1. Machin GA. Vascular anatomy of monochorionic twin placentas. Blickstein I, Keith L, editors. Multiple Pregnancy. United Kingdom: Taylor and Francis, 2005; 193-200
2. Matijevic R, Solac M, Kalogjera N, Kurjak A. Monochorionic twin pregnancy: retrospective analysis of predicted pregnancy outcome. *Croat Med J.* 2003 Dec;44(6):734-9.
3. Rekha B, Ling Y B, Shaheen A, Stuart W. Outcome of twin pregnancies complicated by single intrauterine death in relation to vascular anatomy of the monochorionic placenta. *Hum Reprod.* 1999 Aug;14(8):2124-30.
4. Sebire NJ et al. The hidden mortality in monochorionic twin pregnancies. *Br J Obstet Gynaecology*, 1997 Oct;104(10):1203-7
5. Sherer MD. Adverse perinatal outcome of twin pregnancies according to chorionicity: review of the literature. *Am J Perinatol.* 2001;18(1):23-37.
6. Baghdadi S, Gee H, Whittle MJ, Khan KS. Twin pregnancy outcome and chorionicity. *Acta Obstet Gynecol Scand* 2003; 82: 18-21
7. Victoria A, Mora G, Arias F. Perinatal outcome, placental pathology and severity of discordance in monochorionic and dichorionic twins. *Obstet Gynecol* 2001; 97: 310-315.
8. Hatkar PA, Bhide AG. Perinatal outcome of twins in relation to chorionicity. *J Postgrad Med.* 1999; 45: 33