International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 22-10-2019; Accepted: 24-11-2019
www.medicalsciencejournal.com
Volume 5; Issue 12; December 2019; Page No. 102-104

Study on perinatal outcome of Monochorionic in comparison to dichorionic twin pregnancies

Chiman Lal Maida[1*], Hanslata Gehlot[2]
[1-2] Department of Obstetrics and Gynecology, Dr. S. N Medical College Jodhpur, Rajasthan, India

Abstract
Background: The evolution of advanced reproductive techniques over the past three decades has led to an increase in the incidence of twin pregnancy worldwide. Monochorionic (MC) twins have the highest risk of congenital malformations and two to five fold increased risk of perinatal mortality and morbidity and are at substantially increased risk of adverse outcome compared to Dichorionic (DC) twins.
Aims and Objective: To compare the neonatal outcomes of monochorionic and dichorionic twin pregnancies
Material and Methods: This was a prospective study about all twin pregnancies of known chorionicity at S N Medical College Jodhpur, Rajasthan. Chorionicity was determined on the basis of first-trimester ultrasound assessment of the dividing membrane characteristics and/or routinely postpartum pathological examination of placentas and intertwin membranes.
Results: Out of 240 twin pregnancies, 51 (21.2%) were monochorionic and 189 (78.8%) were dichorionic pregnancies. MC twins had a significantly lower birth weight and gestational age compared to DC twins. Pathologic Doppler results were observed more often for MC pregnancies than for DC pregnancies. Perinatal mortality (±20 weeks of gestation) was 11.6% in MC twin pregnancies and 5.0% in DC twin pregnancies. Mortality rate was 16% for DC and 45% for MC twins.
Conclusion: Perinatal morbidity and mortality remain high among monochorionic twins. This is likely due to frequent twin-to-twin transfusion syndrome, prematurity, fetal growth restriction and intrauterine fetal death. Improved fetal and neonatal management may result in improved outcomes.

Keywords: twins, Monochorionic, dichorionic, perinatal outcome, morbidity, mortality

Introduction
The evolution of advanced reproductive techniques over the past three decades has led to an increase in the incidence of twin pregnancy worldwide. This increase has been observed both in the case of dizygotic and, to a lesser extent, monozygotic twinning [1-3]. Monochorionic twins have the highest risk of congenital malformations, perinatal mortality and morbidity [4]. Monochorionic (MC) twins are variably reported to be at two- to fivefold increased risk of perinatal mortality and morbidity compared with dichorionic (DC) twins [5-8].

MC twins are at substantially increased risk of adverse outcome compared to DC twins [5]. This excess of adversity in MC twins is mainly attributed to the complications resulting from connected circulationc [9]. The vascular anastomoses are the anatomical basis for connected circulation within twin pairs. Three types of vascular anastomoses are reported in injection studies of MC placentas, namely arterio-arterial (AA) anastomoses, veno-venous (VV) anastomoses, and arterio-venous (AV) anastomoses. The unidirectional blood flow in AV anastomoses enables volume disequilibrium, resulting in severe complications such as TTTS and TAPS [10]. In contrast, little is known of the vascular anastomoses in DC placentas due to lack of placental injection forDCplacentas. In addition, placental share discordance is quite common in MC twins, leading to discordant fetal growth, even selective intrauterine growth restriction [9, 11].

The risk in MC twins is increased in particular for stillbirth, leading to recommendations for earlier delivery in MC twins. There is a lack of studies that report prospective risk of stillbirth by gestational age for twin pregnancies on a large population base, in particular stratifying by chorionicity.

Material and Methods
Study Population
A prospective study was conducted in conducted in the Department of Obstetrics and Gynecology, Umaid Hospital under Dr S N Medical College, Jodhpur, Rajasthan over a period of one year from July 2018 to June 2019. There were 5560 children were delivered during the period of one year. Of that 5320 were single birth while 240 were twins.

Methodology
Chorionicity was determined on the basis of first-trimester ultrasound assessment of the dividing membrane characteristics and/or routinely postpartum pathological examination of placentas and intertwin membranes. All twin gestations were monitored according to a standard protocol, which consisted of a first-trimester determination of chorionicity and a detailed anomaly scan at 20 weeks of gestational age; DC twin pregnancies were monitored by regular ultrasound assessment of growth, amniotic fluid volume and Doppler of the umbilical artery at least at 20, 24 and 28 weeks and fortnightly thereafter. In monochorionic twin pregnancies evaluation of growth and Doppler profiles of umbilical artery and middle cerebral artery were performed every 2 weeks from 14 weeks onwards. Women with either non reassuring fetal findings or with maternal complications were submitted to frequent but at least twice weekly maternal–fetal evaluations that were performed during hospitalization or during visits at the outpatient clinic. In uncomplicated MC twins, elective delivery was

offered around 37 weeks of gestation.

Results

Over a period of one year 5560 children were delivered among that 5320 were single births while 240 were twins which accounts the incidence of twins were 4.3%. Out of 240 twin pregnancies 51 (21.2%) were Monochorionic (48 diamniotic, 3 monoamniotic) and 189 (78.8%) were Dichorrionic pregnancies. The mean maternal age was 30.9 ± 5.3 years and 44.6% were primigravidas. The mode of delivery was caesarean section in 80.4%. The distribution of gender in the overall study population was near evenly split with 234 male (48.8%) and 246 female (51.2%) newborns. The mean gestational age at birth was 34 + 2 ± 3 + 1 weeks and the mean birth weight for the larger twin was 2294 ± 597 g (range 680 - 3800 g) and for the smaller twin 1993 ± 577 g.

Comparison of MC and DC twin pregnancies revealed that women with DC twins were on average older than those with MC twins. MC twins had a significantly lower birth weight and gestational age compared to DC twins. Pathologic Doppler results were observed more often for MC pregnancies than for DC pregnancies. Mechanical ventilation or nCPAP was significantly more often required for MC versus DC twins. Incidence of infection was higher in the MC than in the DC group, but this was not significant. TTTS developed in 5 MC twin pregnancies. These pregnancies had to be delivered early (on average at 29 + 1 weeks of gestation), showed a high morbidity (mechaniccal ventilation, infection) and severe birth weight discordance.

Perinatal mortality (±20 weeks of gestation) was 11.6% in MC twin pregnancies and 5.0% in DC twin pregnancies. The excess perinatal mortality in MC twins was mainly due to the high incidence of stillbirths: 7.6% in MC twins compared with 1.5% in DC twins. The incidence of neonatal death did not differ substantially between MC and DC twins. Thirty-eight MC twin pregnancies were complicated by TTTS, of which 9 were treated by laser occlusion of vascular anastomoses. Twenty-two percent (17 out of 76) of MC twins with TTTS died.

Eighty percent of MC twins and 66% of DC twins were admitted to the neonatal nursery. The proportion of twins admitted to the NICU was also higher for MC twins than for DC twins 29.4 and 19.5%, respectively. Overall, neonatal morbidity was considerably higher in MC twins.

IUD rate in continuing pregnancies after 32 weeks of gestation was 2.1% in MC twin pregnancies and 0.3% in DC twin pregnancies (HR 8.75, 95% CI 2.65–28.88). Again, the incidence of neonatal mortality did not differ between both groups. From 37 weeks onwards, intrauterine survival of MC twins decreased, whereas the survival of DC twins remained high. Mortality rates according to chorionicity did not differ.

Table 1: Distribution of total pregnancies (n = 5560)

Pregnancy	Number	Percentage
Single birth	5320	95.7%
Twins	240	4.3%
Total	5560	100%

Table 2: Distribution of twins (n = 240)

Twins	Number	Percentage
Monochorionic	51	21.2%
Dichorionic	189	78.8%
Total	240	100%

Table 3: Obstetric and fetal parameters of twin pregnancy

Parameters	Mean ± SD
Maternal age	30.9 ± 5.3
Gestational age (Week + days)	34 + 2 ± 3 + 1
Birthweight 1st twin	2294 ± 597
Birthweight 2nd twin	1993 ± 577

Table 4: Maternal, obstetric, fetal and neonatal parameters and chorionicity

Parameters	Chorionicity	
	Dichorionic	Monochorionic
1. Maternal Parameters		
Maternal age	31.3 ± 5.2	29.4 ± 5.5
Gestational age (Week + days)	34 + 3 ± 3 + 1	33 + 1 ± 3+1
2. Obstetric parameters		
Pathologic Doppler	23 = 12.2%	12 = 23.5%
3. Fetal parameters	n = 378 = 78.9%	n = 102 = 21.1%
Birth weight (g) Mean ± SD	2205 ± 581	1920 ± 587
4. Neonatal parameters		
Ventilation/nCPAP	84 = 22.2%	35 = 34.3%
Infection ± sepsis in first week	20 = 5.3%	10 = 9.8%
IVH ≥3°	7 = 1.9%	3 = 2.9%
Perinatal mortality	5.0%	11.6%
Neonatal death during stay in NICU	5.8	9.5

Discussion

Monochorionic (MC) twins are two to fivefold increased risk of perinatal mortality and morbidity compared to dichorionic (DC) twins [5-8].

In this study we found that out of 240 twin pregnancies, 51 (21.2%) were MC (48 diamniotic, 3 monoamniotic) and 189 (78.8%) were DC pregnancies. Our results are in concordant with Corinna P *et al* [12] who also reported monochorionic and dichorionic pregnancy were the 21% and 77% respectively.

In this study we found that the mean maternal age was 30.9 ± 5.3 years which is concordant with the study conducted by Ratha Chinmayee *et al*. [13] who has reported 30.8± 4.6 years.

Our findings about higher early neonatal mortality rate for MC twins are in concordant to a recent report[14]. Our finding are in line with various reports demonstrating less favourable pregnancy outcomes in MC vs DC twins and also support reports that noted a correlation between preterm delivery and higher infection and mechanical ventilation rates in MC twins. MC twins are described to be

at a higher risk for fetal (even at term) and neonatal death, necrotising enterocolitis and neurological injury [15] similar to our results regarding early neonatal death.

Previous studies have also shown that perinatal mortality in DC pregnancies (i.e. after 37 weeks of gestation) is relatively low at term (0.5–4.5%; in our study 0.3%) and that death in term MC twins is higher (2.0–6.8%; in our study 3.5%) [16-18].

However, even in the absence of either TTTS or single intrauterine fetal death, neuromorbidity is increased in (preterm) MC twins compared with DC twins. Multiple vascular anastomoses may indeed cause transitory cardiovascular imbalance, severe enough to decrease brain perfusion and to cause cerebral lesions without resulting in an IUD or clinically evident TTTS [19].

Our study suggests that the optimal time of delivery is 36 weeks of gestation. Barigye *et al*. [20] suggested an even earlier delivery (34–35 weeks), given the earlier occurrence of IUDs in their study. On the basis of our study and that of Barigye *et al* it seems likely that about one-third of the intrauterine demise may be prevented when delivery takes place before 37 weeks. Such an early delivery is also suggested by the recent small population of Cordero *et al*. [21] who found no fetal deaths in deliveries between 34 and 37 weeks.

Conclusion

Perinatal morbidity and mortality remain high among monochorionic twins. This is likely due to frequent twin-to-twin transfusion syndrome, prematurity, fetal growth restriction and intrauterine fetal death. Improved fetal and neonatal management may result in improved outcomes.

References

1. Platt MJ, Marshall A, Pharoah PO. The effects of assisted reproduction on the trends and zygosity of multiple births in England and Wales 1974–99. Twin Res 2001;4:417–21
2. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Munson ML. Births: final data for 2002. Natl Vital Stat Rep 2003;52:1–113
3. Blickstein I. Estimation of iatrogenic monozygotic twinning rate following assisted reproduction: pitfalls and caveats. Am J Obstet Gynecol 2005;192:365–8
4. Powers WF, Kiely JL. The risks confronting twins: a national perspective. Am J Obstet Gynecol 1994;170(2):456-61
5. Sebire NJ, Snijders RJ, Hughes K, Sepulveda W, Nicolaides KH. The hidden mortality of monochorionic twin pregnancies. BJOG 1997;104:1203–7
6. Hatkar PA, Bhide AG. Perinatal outcome of twins in relation to chorionicity. J Postgrad Med 1999;45:33–7
7. Leduc L, Takser L, Rinfret D. Persistance of adverse obstetric and neonatal outcomes in monochorionic twins after exclusion of disorders unique to monochorionic placentation. Am J Obstet Gynecol 2005;193:1670–5
8. Hack KE, Derks JB, de Visser VL, Elias SG, Visser GH. The natural course of monochorionic and dichorionic twin pregnancies: a historical cohort. Twin Res Hum Genet 2006;9:450–5
9. Lewi L, Jani J, Blickstein I, Huber A, Gucciardo L, Van Mieghem T, Deprest J. The outcome of monochorionic diamniotic twin gestations in the era of invasive fetal therapy: A prospective cohort study. American Journal of Obstetrics and Gynecology. 2008; 199(5):514-8.
10. Lopriore E, van den Wijngaard JP, Middeldorp JM, Oepkes D, Walther FJ, van Gemert MJ, Vandenbussche FP. Assessment of feto-fetal transfusion flow through placental arterio-venous anastomoses in a unique case of twin-to-twin transfusion syndrome. Placenta 2007; 28:209-11.
11. Fick AL, Feldstein VA, Norton ME, Wassel Fyr C, Caughey AB, Machin GA. Unequal placental sharing and birth weight discordance inmonochorionic diamniotic twins. American Journal of Obstetrics and Gynecology. 2006; 195:178-83.
12. Corinna Peter, Paul Wenzlaff, Jan Kruempelmann, Gerhard Alzen, Eva Bueltmann, Susanne E. Gruessner. Perinatal morbidity and early neonatal mortality in twin pregnancies. Open Journal of Obstetrics and Gynecology 2013; 3:78-89.
13. Ratha Chinmayee, Kaul Anita An Analysis of Pregnancy Outcome in Dichorionic and Monochorionic Twins Given Special Antenatal and Intranatal Care: A Four-Year Survey. The Journal of Obstetrics and Gynecology of India 2014; 64(4):255–259
14. Rde, C.A.M., Brizot Mde, L., Liao, A.W., Krebs, V.L. and Zugaib, M. Early neonatal morbidity and mortality in growth-discordant twins. Acta Obstetricia et Gynecologica Scandinavica. 2009; 88:167-71.
15. Bagchi, S. and Salihu, H.M. Birth weight discordance in multiple gestations: Occurrence and outcomes. Journal of Obstetrics and Gynaecology2006; 26, 291-6.
16. Chitrit Y, Filidori M, Pons JC, Duyme M, Papiernik E. Perinatal mortality in twin pregnancies: a 3-year analysis in Seine Saint-Denis (France). Eur J Obstet Gynecol Reprod Biol 1999; 86:23–8.
17. Bleker OP, Oosting H. Term and post term twin gestations. Placental cause of perinatal mortality. J Reprod Med 1997;42:715–8
18. Derks J, Voerman SK, Elias SG, Bode CL, Ten Hof J, Roos E *et al*. Mortality and morbidity in mono- and dichorionic twin pregnancies: a retrospective analysis of 630 pregnancies. Fetal Diagn Ther 2003; 18 (Suppl 1):28.
19. Lewi L, Van Schoubroeck D, Gratacos E, Witters I, Timmerman D, Deprest J. Monochorionic diamniotic twins: complications and management options. Curr Opin Obstet Gynecol. 2003;15:177-94.
20. Barigye O, Pasquini L, Galea P, Chambers H, Chappell L, Fisk NM. High risk of unexpected late fetal death inmonochorionic twins despite intensive ultrasound surveillance: a cohort study. PLoS Med. 2005; 2:e172.
21. Cordero L, Franco A, Joy SD, O'Shaughnessy RW. Monochorionic diamniotic infants without twin-to-twin transfusion syndrome. J Perinatol. 2005; 25:753-8