



Perinatal morbidity and mortality in monochorionic diamniotic twin pregnancies ≥ 32 weeks of gestation in a tertiary care centre-a retrospective study

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Abstract

Objective: To study perinatal outcome in monochorionic diamniotic twins ≥ 32 weeks of gestation.

Design: Retrospective study

Setting: Government medical college Thrissur

Population: All monochorionic twin pregnancies ≥ 32 weeks of gestation delivered between 2007 January to 2017 December.

Methods: Medical records of all monochorionic twins in the time period were reviewed.

Main outcome measures: perinatal morbidity and mortality in babies.

Conclusion: In monochorionic twin pregnancies the incidence of adverse outcome, NICU admission, NEC, IVH, RDS, IUD, NND are at a higher level irrespective of mode of delivery.

Introduction

Monochorionic (MC) twins are at increased risk of perinatal mortality and neonatal morbidity compared with dichorionic twins¹. This is because of haemodynamic imbalance caused by placental vascular anastomoses^{1,2}. In the case of fetal death, these vascular anastomoses put the surviving sibling at increased risk of co-twin death or adverse neurological outcome^{3,4}. Even after excluding twin-twin transfusion syndrome mortality is still higher than dichorionic twins⁵. Unfortunately current antenatal surveillance like fetal heart rate monitoring, fetal ultrasound and

Doppler studies fails to predict or prevent such cases⁶. As a consequence, there is controversy in the literature about when to deliver twins. Intrauterine fetal death rates vary from 32 weeks of gestation, leading to diverse recommendations on the optimal timing of delivery^{1,5,7-12}. The same holds as to the mode of delivery in relation to the perinatal mortality¹³⁻¹⁸. However previous studies on the subject is lacking in our institute, we set up a study to assess the perinatal morbidity and mortality among MCDA twins of ≥ 32 weeks of gestation.

Methods

The study was performed in a tertiary care centre –Government medical college, Thrissur. The study was approved by institutional research committee and ethical committee.

We reviewed the medical records of all MC twin pregnancies delivered in our institution between January 2007 and 2017 December..First,a selection was made of all twin pregnancies with identical gender, i.e. boy-boy or girl-girl twin. Subsequently , we checked the medical charts to assess whether the pregnancy was monochorionic or not. Monochorionicity was determined on the basis of first trimester ultrasound assessment of the dividing membrane characteristics. (absence of twin peak sign and presence of thin dividing membrane)or from postpartum examination of the placenta and inter twin membrane.

All MCDA twins were monitored according to a standard protocol, which consisted of a first trimester ultrasound determination of chorionicity, a detailed anomaly scan at 20 weeks of gestational age and regular ultrasound assessment of growth, amniotic fluid volume and Doppler of the umbilical artery atleast 20,24 and 28 weeks and fortnightly thereafter. Women with either non reassuring fetal findings or with maternal complications were submitted to frequent but atleast twice weekly maternal and fetal evaluations like amiotic fluid volume and Doppler assessment of umbilical artery, and if abnormal, then Doppler of middle cerebral artery and ductus venosus –and assessment of blood pressure, and if indicated laboratory assessments, that were performed during hospitalisation or during visits at an outpatient clinic setting.

Termination of pregnancy was offered around 36-37 weeks of gestation if no complication occurred. If any complication that were managed accordingly.

Baseline characteristics, course of pregnancy, mode of delivery as well as neonatal outcome were documented.

Gestational age was calculated from the first day of last menstrual period confirmed by first

trimester ultrasound or from the day of oocyte transfer in pregnancies from assisted reproduction. In this study all MCDA twins ≥ 32 weeks of gestation who met the inclusion criteria were included. Stillbirth was defined as an IUFD occurring from 32 weeks of gestation. Gestational age at the time of death were ascertained by ultrasound. Still birth were divided in antepartum deaths, i.e. fetuses in which death was known before onset of labour, and intrapartum fetal deaths, i.e. fetuses that were alive at the start of labour. Early neonatal death was defined as death of an infant during the first 7 days of life, whereas late neonatal death was defined as death between 8 and 28 days after birth²⁰. Perinatal mortality was defined as IUFD or early neonatal death (within 8 days of life). Composite major neonatal morbidity was defined as the occurrence of one or more of the following issues; respiratory distress syndrome, intraventricular haemorrhage²¹, necrotising enterocolitis²² and proven sepsis. Selective intrauterine growth restriction was defined as sonographically estimated fetal weight below the 10th percentile in one twin²³. Discordant twins were defined as birth weight difference of 25% between foetuses.

Analysis

First, we studied perinatal outcome (apgar score at 5 minute, NICU admission, NEC, RDS, IVH) and second we studied the maternal characteristics (age, gestational age, mode of delivery, any complications).

All statistical analysis was performed with the SPSS system.

Results

During 10 year period 198 sets of MCDA twins were delivered. Of which 23 sets delivered before 32 weeks and thus were excluded. 175 sets delivered after 32 weeks. (n=number of babies=350). Major congenital anomalies were noted in 7 cases (2%). Of these 175 women, 75 cases were referred from secondary hospitals because of pregnancy complications. Maternal age

and parity are shown in table 1 and 2 respectively. Baseline characteristics of the pregnancies are shown in Table 3. Majority belong to age group between 20-30 years. (72.5%) majority were nullipara (n=69). Female babies were slightly higher than male babies (180 vs 170). Median gestational age at delivery was 36-37 weeks (n=45). Of the total cases, 45% (n=79) delivered by caesarean section. Of which 27 cases performed for previous CS, 25 for non vertex presentation, 7 for preeclampsia. Failed induction was 7, fetal distress 5 (2 cord prolapse), abruption 4, abnormal Doppler was 4. Total induced cases were 35.

Table 4 shows incidence of IUFD, stillbirth, neonatal death and neonatal morbidity. Low Apgar score at 5 minute (<3) was observed in 10 babies of which 5 born vaginally and 5 by caesarean section. Apgar score between 3-5 were observed in 6 babies, both vaginal delivery and caesarean contributes equally. Overall perinatal mortality was 27 in number (7%) In which 20 died in utero, 3 fetuses died before 32 weeks. There were 17 cases of neonatal deaths and all of them had a birth weight of less than 1 kg. 7 cases were early neonatal death. Average birth weight was 1.8 kg. Discordant twins were 48 (27%). Total 155 babies were admitted in NICU and 75 among them were <34 weeks. 21 cases were >36 weeks. RDS was observed in 70 cases and NEC in 30 cases. IVH seen in 30 cases. Sepsis observed in 11 cases. Composite morbidity seen in 50% of cases. Anomalies were observed in 8 babies.

There were no significant differences in mortality between women who had a planned caesarean section compared with those who underwent a trial of labour. Women with a planned caesarean section were at increased risk of neonatal morbidity, respiratory distress syndrome and admission to the neonatal intensive care unit with infants delivered vaginally.

Table 1. Maternal age

Twin pregnancies (n=175)

Age in years	N	(%)
<20	12	(7)
20-30	127	(72)
30-40	34	(19)
>40	2	(1%)

Table 2. Parity

Nullipara	87	(49%)
Para 1	69	(39%)
Para 2	16	(10%)
Para 3	3	(2%)

Table 3. Gestational age and mode of delivery

Gestational age	n
32-33 weeks	
Vaginal delivery	31
Caesarean	6
33-34 weeks	
Vaginal delivery	6
Caesarean	3
34-35 weeks	
Vaginal delivery	9
Caesarean	13
35-36 weeks	
Vaginal delivery	11
caesarean	9
36-37 weeks	
Vaginal delivery	18
caesarean	27
>37 weeks	
Vaginal delivery	21
caesarean	21

Table 4. Perinatal outcome N

IUFD	20
NND	27
RDS	70
NEC	30
IVH	30
Congenital anomaly	7
sepsis	11

IUFD-intrauterine fetal death, NEC-necrotising enterocolitis, RDS-respiratory distress syndrome, IVH-Intraventricular haemorrhage.

Pre eclampsia was observed in 33 cases (18%), of which 2 cases developed eclampsia. GDM developed in 11 cases (6%) and PPH seen in 11 cases (6%), managed medically in 9 cases and needed surgical intervention in 2 cases. Abruption seen in 8 cases which contributes to 4.5% cases. MSAF in 5 cases (3%). Cord prolapse seen in 2 cases.

Discussion

This study provides important information regarding maternal characteristics and perinatal complications among MCDA twins.

The majority of pregnancies in this study were uncomplicated pregnancies, treated in our institution whereas 31 % were referred from regional hospitals. Analysis of the mortality data did not show any significant differences in results between referred pregnancies and pregnancies that had all their antenatal care in our institution. Perinatal mortality in this study was 7%. In another study, the perinatal mortality was between 20-68 per 1000 births.^{1,24} IUFD in this study was 20. Various studies showed the same incidence²⁵. Fetal death in MC twins might be prevented by intensive monitoring as was described by Simoes et al⁸. Even if their intensive follow up, the incidence of IUFD is similar to that of this study in which pregnancies were monitored fortnightly. so further studies are required to know how frequently these patients should be monitored to prevent fetal death. Recent studies pointing out the increased risk of unexpected fetal death in MC twins might have caused higher awareness to the management of the uncomplicated MC twin, resulting in improved monitoring, earlier delivery and higher survival rates

The contribution of mode of delivery to the increased perinatal mortality in MC twins is not clear and there is no consensus regarding the optimal mode of delivery. Second born twins are at higher risk of perinatal mortality and morbidity compared with the first born twins^{15,17}. They are more likely to have intrapartum complications as a result of difficulties in fetal monitoring, malpresentations and acute TTTS during labour. These complications may necessitate emergency caesarean delivery of the second twin after vaginal birth of the first. Some studies suggest planned caesarean section to prevent this^{13,14}. However these benefits should be weighed against the risks of neonatal respiratory morbidity in infants delivered by planned caesarean section. Maternal complications are also high in caesarean

section. One study showed higher incidence of neonatal mortality and admission to NICU for the babies born by caesarean section compared with vaginal delivery¹⁸.

A female preponderance in pregnancies complicated by TTTS has been reported^{26,27}. Our study showed a slight female preponderance even if it is statistically not significant. This might be due to increased mortality rate of male fetuses before 20 weeks. It was also shown that the later the twinning event, the higher the female to male ratio. This might be because of anomalous X inactivation, leading to delayed embryonic maturation and subsequent fusion of germinal disc, or it might be linked to the fact that all females are mosaics and therefore prone to splitting²⁸.

Conclusion

In monochorionic twin pregnancies the incidence of adverse outcome, NICU admission, NEC, IVH, RDS, IUD, NND are at a higher level irrespective of mode of delivery.

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