Outcome of Twins Discordant for Major Anomalies

Tseten Zangmu Bhutia[1] Geeta Kolar[1] Kamala Kavuri[1] Saritha Redishetty[1] Prathiba Reddy[1] Arati Singh[1] Smita Pawar[1] Mounika Kachakayala[1] Raksha Shivaramegowda[1] Suseela Vavilala[1]

[1] Department of Fetal Medicine, Fernandez Foundation, Hyderabad, Telangana, India

Address for correspondence Suseela Vavilala, MBBS, DNB OBG, Department of Fetal Medicine, Fernandez Foundation, Hyderabad 500029, Telangana, India (e-mail: drsuseela@fernandez.foundation).

J Fetal Med 2024;11:107–114.

Abstract

Objectives This article determines the incidence, management, and outcomes of twins discordant for major structural anomalies.

Materials and Methods A retrospective observational study was conducted from 2011 to 2021. Pregnant women discordant for major malformations as confirmed postnatally were included in the study. Demographic and clinical details were collected from medical records. Determining the incidence and profile of twins discordant for major structural anomalies and their management and outcomes were considered as primary objectives that were detailed in dichorionic (DC) and monochorionic (MC) twin pregnancies.

Results A total of 83 subjects were included, with an incidence of 1.76% in DC pregnancies and 1.4% in MC pregnancies. Major structural anomalies among DC twins were musculoskeletal (26%), followed by circulatory system anomalies (20.2%), while among MC twins, the majority were found to be central nervous system anomalies (35.7%). Gastrointestinal system anomalies were found the least, with 5.8% in DC anomalous twins, and none were observed in MC anomalous twins. Live birth rate among anomalous twins was found to be 79.71 and 64.29%, and in normal cotwins, it was 92.75 and 85.71% in DC and MC twins, respectively. Surviving anomalous twins underwent postnatal surgery or intervention in 25/69 (36.2%) DC twins, out of which 20 infants were alive and healthy. In the MC anomalous twin group, 3/14 (21.42%) underwent surgical correction; all were alive and well. Postnatally, babies were followed up until 2 years of life. The survival rate for anomalous twins was 47.82% in DC and 35.7% in MC twins. Normal cotwins had overall favorable outcomes, with a survival rate of 89.8 and 85.7% in DC and MC twins, respectively.

Conclusion In DC twins discordant for major anomalies, expectant management is a safe option.

Keywords
- discordant twins
- dichorionic twins
- monochorionic twins
- fetal outcomes
- postnatal surgery

DOI https://doi.org/10.1055/s-0044-1788647.
ISSN 2348-1153.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

Introduction

Twin pregnancies account for approximately 2 to 3% of all pregnancies and are often considered high-risk pregnancies warranting specialized care.[1] They are classified into dichorionic (DC) diamniotic, monochorionic (MC) monoamniotic, and MC diamniotic. Depending on the fetus affected, discordance can be concordant (both twins affected) or discordant (only one).[2] Discordant for anomaly is a condition in which one fetus is normal and the cotwin carries a malformation.[3] When a structural anomaly detected on ultrasound is found to be lethal, requires postnatal surgery, and has an increased risk of functional or neurological impairment, it is considered a major structural anomaly.[4] Major adverse outcomes associated with discordance are preterm birth, fetal growth restriction (FGR) and perinatal loss.[5–7] Studies on higher population sizes have also stated that further evaluations are required.[8–10] An approximately twofold increase in complications is seen among MC twins compared with DC twins.[11,12] In terms of mode of delivery, women should be informed about the possibilities of vaginal delivery and cesarean section delivery, since vaginal delivery does not increase any risk in comparison.[13] Management of discordant twins includes an increased frequency of prenatal visits, amnioreduction, selective fetal reduction (SFR) of anomalous fetuses, or expected management of both fetuses.[14] SFR is often thought to affect normal twins, inducing miscarriage or less of whole pregnancy, mainly in MC twins. This impacts the survival and live birth rates of fetuses.[15] In cases where the abnormality is lethal and affects the survival of normal cotwins, it is considered best to avoid and prevent risk to normal cotwins.[16] Studies conducted to report outcomes associated with discordant twins have been the least studied, particularly in the Indian population. Knowledge and evidence on associated maternal and fetal outcomes are needed to counsel women with discordant twins with major anomalies. The current study aimed to determine the associated adverse maternal and fetal outcomes among discordant twin pregnancies seen over 10 years.

The current retrospective observational study was conducted to determine the incidence and profile of twins discordant for major anomalies and to study their management and outcomes using antenatal ultrasound.

Objectives

(1) To determine the incidence and profile of twins discordant for major structural anomalies.
(2) To study the management and outcomes of discordant twins.

Materials and Methods

A retrospective observational study was carried out in the fetal medicine unit at Fernandez Hospitals, Hyderabad, Telangana, India, with data from 2011 to 2021. Ethical approval was obtained from the institutional ethical committee (IEC Ref. No. 12_2022). Pregnancies discordant for major anomalies on ultrasound and managed at our hospital, SFR performed outside (on the choice of mothers) with continuation of pregnancy with us where all anomalies were confirmed postnatally, were included in the study. Medical case records with a lack of information on management or delivery conditions, women with dual intrauterine fetal demise (IUFD) in pregnancies not complicated by fetal malformations, twin-to-twin transfusion syndrome (TTTS), twin anemia polycythemia sequence (TAPS), twin reversed arterial perfusion sequence (TRAPS), IUFD of one or both the twins at the time of referral, and women with ultrasound markers such as a single umbilical artery, choroid plexus cyst, mild grade pyelectasis, and ventriculomegaly were excluded from the study.

Clinical data of twin mothers with major structural malformations diagnosed by ultrasound were retrospectively reviewed from the hospital medical records. To avoid interpersonal variation in ultrasound detection of major anomalies, an ultrasound performed by fetal medicine specialists who follow standard protocols for diagnosis was considered. Gestational age and chorionicity were detected at an early scan before 14 weeks. All scans were performed using a GE Voluson ultrasound machine. Details such as fetal malformation, chorionicity, type of anomaly, mean gestational age of anomaly detection, opted management option, birth weight, prenatal invasive testing (if done), adverse outcome of both the discordant and normal twin, perinatal survival rate, and live birth rate were collected. The final diagnosis of fetal defects was based on the results from postnatal examination in cases of live births and findings from the last ultrasound examination in cases of pregnancy termination, miscarriage, or stillbirth.

Descriptive analysis was carried out using mean and standard deviation (SD) in case of normal distribution data, median interquartile range in case of nonnormal distribution data for quantitative variables, and frequency and proportion for categorical variables. All quantitative variables were checked for a normal distribution within each explanatory variable category by visual inspection of histograms and normality Q-Q plots. The Shapiro–Wilk test was also conducted to assess normal distribution. Major structural anomalies were considered the primary outcome variable and were described for DC and MC twin pregnancies. Anomalous and normal twin outcomes were considered the secondary outcome variables that were compared between the DC and MC twin pregnancies.

Results

Over the study duration of 10 years, 4,887 twin pregnancies (3,893 DC pregnancies and 996 MC pregnancies) were observed at our study site, out of which 83 cases were found to be discordant twins with major structural anomalies. Hence, a total of 83 subjects were included in the final analysis, with incidence of 1.76% (69) and 1.46% (14) in DC and MC twins, respectively.

►**Table 1** shows a comparison of basic demographic details and antenatal characteristics between DC and MC

Table 1 Antenatal characteristics of twins discordant for anomalies ($n = 83$)

Parameter	Chorionicity	
	Dichorionic ($N = 69$)	Monochorionic ($N = 14$)
Maternal age (y)	30.9 ± 4.86	27.93 ± 2.76
Nulliparous	59 (85.51%)	10 (71.43%)
In vitro fertilization (IVF)	30 (43.48%)	1 (7.14%)
Gestational age of detection (wk)	21 ± 4.61	21.64 ± 4.57
Chromosomal microarray (normal)	13 (18.84%)	2 (14.29%)
Single fetal reduction	1 (1.45%)	1 (7.14%)
Gestational age at delivery (wk)	33.96 ± 3.56	32.43 ± 5.3
Gestational age at fetal reduction (wk)	22	16
$0–25^{+6}$ weeks (spontaneous miscarriage)	2 (2.9%)	2 (14.29%)
$26–36^{+6}$ weeks (preterm birth)	49 (71.01%)	10 (71.43%)
Spontaneous preterm birth	29 (42%)	5 (35.7%)
Iatrogenic preterm birth	20 (28.9%)	3 (21.42%)
$\geq$ 37 wk	18 (26.09%)	2 (14.29%)
Live birth rate		
Normal cotwin twin	64 (92.75%)	12 (85.71%)
Anomalous twin	55 (79.71%)	9 (64.29%)
Survival rate		
Normal cotwin	62 (89.86%)	12 (85.71%)
Anomalous twin	33 (47.82%)	5 (35.71%)

pregnancies. The maternal age (mean $\pm$ SD) was found to be 30.9 ± 4.86 and 27.93 ± 2.76 years among DC and MC pregnancies, respectively. Advanced maternal age women were 12/69 in DC pregnancies (35–44 years) and none in MC pregnancies. Two cases had miscarriages in both DC and MC pregnancies. In DC pregnancies, there was one spontaneous miscarriage and another after fetal reduction at 22 weeks (potassium chloride), where the pregnancy was prolonged until 32 weeks. In the MC pregnancies, one had a spontaneous miscarriage at 20 weeks, and the other underwent SFR at 16 weeks and had a miscarriage at 18 weeks postradiofrequency ablation.

In DC twins, live birth rates of anomalous twins and normal cotwins were 79.71 and 92.75%, respectively, and survival rates of anomalous twins and their normal cotwin were 47.82 and 89.86%.

In MC twins, the live birth rate of anomalous twins and normal cotwin was 64.29 and 85.71%, respectively. Survival rates of anomalous twins and normal cotwins were 35.71 and 85.71% respectively. The preterm birth rate was similar in both groups, at 71%. In DC twins, 42% of cases had spontaneous preterm birth and 28.9% were birthed due to FGR with Doppler compromise and preeclampsia. In MC twins, 35.7% were spontaneously birthed and 21.4% cases were birthed due to FGR with Doppler compromise. All the women who underwent invasive testing and underwent chromosomal microarray analysis (18.84% DC and 14.29% MC) were reported to be normal.

►**Table 2** is a description of system- and chorionicity wise major anomalies according to the International Classification of Diseases, 10th Revision classification. Antenatal findings reported that major anomalies were those of musculoskeletal system (26%), where talipes equinovarus was the most common anomaly in DC discordants, while in MC discordants, the majority of anomalies were of the central nervous system (35.7%), with anencephaly. Gastrointestinal and respiratory system anomalies were found to be the least common among DC discordants, while none of these system anomalies were observed in MC twins.

►**Tables 3** and **4** describe the number of cases ending up with miscarriage, single fetal demise (SFD), SFR, and postnatal outcome of live birth, neonatal death (NND), postnatal surgery, and their follow up to 2 years of life. Postnatally, in the DC twin, 25/69 (24.63%) underwent surgical correction, of which 12 infants were alive and healthy, 1 case of spina bifida had motor defects and was on physiotherapy, 1 case of severe ventriculomegaly had a delayed developmental milestone, and 2 cases died after surgery. Cases of talipes equinovarus, who had a cast and Achilles tenotomy, and a case of a pacemaker for heart block are doing well. Hence, 20/25 neonates who underwent postnatal correction were alive and healthy. In the MC anomalous twin group, 21.42% underwent surgical correction, and all were alive and well.

►**Figs. 1** and **2** represent the ultrasound images of a few fetuses with structural anomalies.

Table 2 System-wise major anomalies found in twin discordant pregnancies antenatally and postnatally ($N = 83$)

System	Chorionicity	
	Dichorionic ($N = 69$)	Monochorionic ($N = 14$)
Musculoskeletal system	18 (26%)	3 (21.4%)
Circulatory system	14 (20.2%)	4 (28.5%)
Urinary system	8 (11.59%)	1 (7.14%)
Central nervous system	7 (10.14%)	5 (35.71%)
Face and neck	7 (10.14%)	1 (7.14%)
Respiratory system	5 (7.24%)	0
Gastrointestinal system	4 (5.8%)	0
Multisystem abnormality	6 (8.69%)	0

Table 3 Descriptive analysis of congenital anomalies in the dichorionic pregnancy ($n = 69$) according to ICD-10

Types of system-wise anomalies	Number of cases, *n* (%)	Perinatal outcome
Malformation of the central nervous system		
Severe ventriculomegaly	2 (2.90)	2 operated (1 of which had delayed milestone)
Agenesis of corpus callosum	2 (2.90)	1 SFD, 1 NND
Anencephaly	1 (1.45)	NND
Arnold–Chiari II malformation	1 (1.45)	Spina bifida repair, on physiotherapy for motor defects
Occipital encephalocele	1 (1.45)	Operated, alive and healthy
Malformation of the face and neck		
Cleft lip and palate	5 (7.24)	One miscarriage, 1 SFR, 1 SFD, 1 operated (alive and well), 1 live birth but death at 2 months due to prematurity
Cystic hygroma	2 (2.9)	2 SFD
Malformation of the circulatory system		
Hypoplastic left heart syndrome	4 (5.79)	4 NND
Atrioventricular septal defect	2 (2.9)	1 operated alive and healthy, 1 SFD
Double outlet right ventricle + hypoplastic aortic arch	2 (2.9)	1 NND, one live birth but death at 46 days of life
Tetralogy of Fallot	1 (1.45)	Operated (alive and healthy)
Transposition of great arteries + ventricular septal defect	1 (1.45)	Operated, death at 2nd month of life
Right aortic arch + ventricular septal defect	1 (1.45)	Under follow-up
Coarctation of aorta	1 (1.45)	Operated, alive and healthy
Congenital heart block	1 (1.45)	Pacemaker, alive and healthy
Univentricular heart + single outflow	1 (1.45)	Operated, death at 4th month of life
Malformation of the respiratory system		
Tracheoesophageal fistula	3 (7.89)	2 SFD, 1 NND
Congenital high airway obstruction syndrome	1 (1.45)	SFD
Pleural effusion	1 (1.45)	SFD
Malformation of the gastrointestinal system		
Small bowel obstruction	2 (2.9)	Two operated, alive and healthy
Large bowel obstruction	1 (1.45)	Operated, alive and healthy

Table 3 (*Continued*)

Types of system-wise anomalies	Number of cases, *n* (%)	Perinatal outcome
Duodenal atresia	1 (1.45)	Operated, alive and healthy
Malformation of the urinary system		
Unilateral multicystic dysplastic kidney	3 (7.89)	Three under follow-up
Bilateral hydronephrosis	3 (7.89)	Three under follow-up
Bilateral renal agenesis	1 (1.45)	SFD
Lower urinary tract obstruction	1 (1.45)	NND
Malformation of the musculoskeletal system		
Talipes equinovarus	8 (11.59)	One miscarriage, seven castings and Achilles tenotomy (alive and healthy)
Hemivertebra + scoliosis	4 (5.79)	One operated, one under follow-up, 2 NND
Congenital diaphragmatic hernia	3 (4.34)	2 operated (alive and healthy), 1 SFD
Skeletal dysplasia	3 (4.34)	One NND, one death at 2 months of live
Multisystem	6 (8.69)	2 SFD, 2 NND, two death at 4th month of life

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; NND, neonatal death; SFD, single fetal demise.

Table 4 Descriptive analysis of congenital anomalies in the monochorionic pregnancy ($n = 14$) according to ICD-10

Types of system-wise anomalies	Number of cases *n* (%)	Perinatal outcome
Malformation of the central nervous system		
Anencephaly	2 (14.29)	1 SFD, 1 NND
Arnold–Chiari II malformation	1 (1.45)	SFD
Holoprosencephaly + ventriculomegaly	1 (7.14)	NND
Diastematomyelia	1 (7.14)	Miscarriage after RFA
Malformation of the face and neck		
Cystic hygroma	1 (7.14)	SFD
Malformation of the circulatory system		
Common arterial trunk + atrioventricular septal defect	1 (7.14)	Operated, alive and healthy
Ventricular septal defect	1 (7.14)	Under follow-up
Right aortic arch + ventricular septal defect	1 (7.14)	Operated, alive and healthy
Right isomerism (heterotaxy)	1 (7.14)	Live birth, death after 45 days
Malformation of the urinary system		
Unilateral multicystic dysplastic kidney	1 (7.14)	Under follow-up
Malformation of the musculoskeletal system		
Talipes equinovarus	1 (7.14)	Spontaneous miscarriage
Congenital diaphragmatic hernia	1 (7.14)	Operated, alive and healthy
Exomphalos	1 (7.14)	NND

Abbreviations: ICD-10, International Classification of Diseases, 10th Revision; NND, neonatal death; RFA, radiofrequency ablation; SFD, single fetal demise.

►**Table 5** shows the fetal and neonatal parameters of DC discordant twins. Among DC twins, males were seen in greater proportions in both anomalous (62.31%) and normal cotwins (52.17%). FGR and SFD were greater in anomalous twins (42 and 18.84%, respectively), with a lower gestational age at SFD in anomalous twins (27.00 ± 5.70 weeks) than in normal cotwins (34.0 ± 2.65 weeks). In the anomalous twins, 13/69 (18.8%) had SFD and all their cotwins had live births. Three challenging case scenarios of cleft lip and palate, congenital diaphragmatic hernia, and occipital encephalocele where there was SFD of its normal cotwins and the anomalous twin had a live birth and underwent surgery.

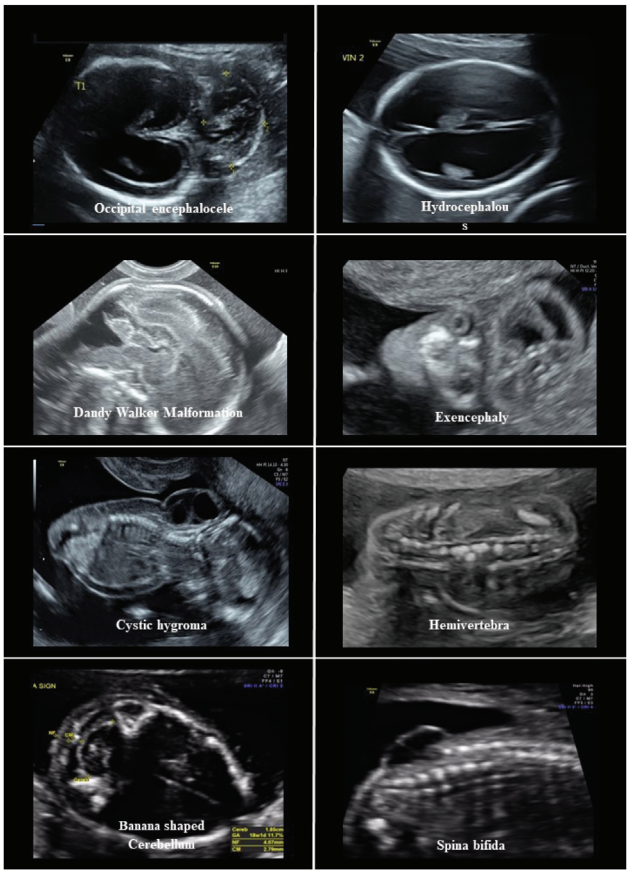

Fig. 1 Ultrasound images of few discordant twins with various anomalies as depicted in the pictures.

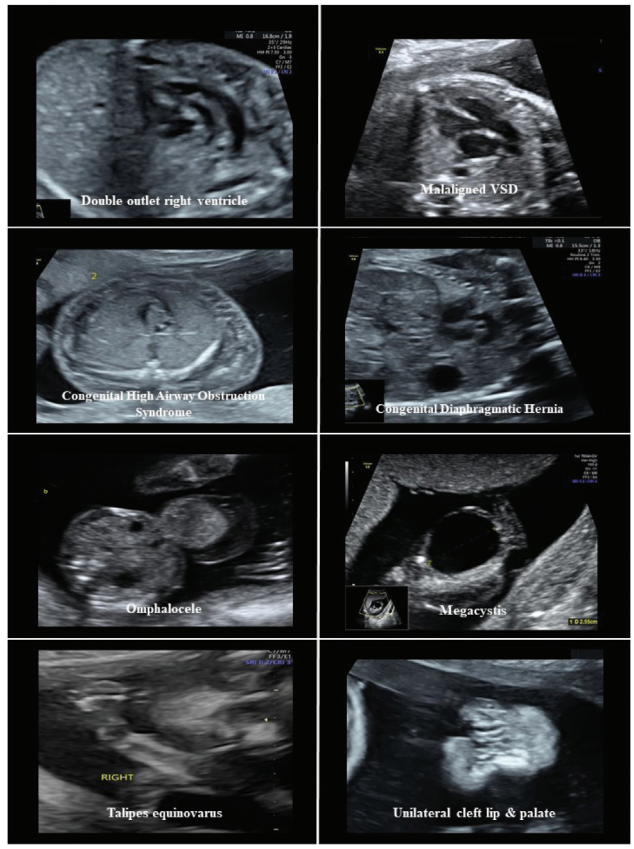

Fig. 2 Ultrasound images of few discordant twins with various anomalies as depicted in the pictures.

Table 5 Fetal and neonatal parameters of DC discordant twins ($N = 69$)

Parameters	Anomalous twin	Normal cotwin
Gender		
Male	43 (62.31%)	36 (52.17%)
Female	23 (33.33%)	31 (44.92%)
Ambiguous	1 (1.44%)	0
FGR	29 (42%)	11 (15.94%)
Single fetal demise (SFD)	13 (18.84%)	3 (4.34%)
Gestational age of SFD (wk)	27.00 ± 5.70	34.0 ± 2.65
Birth weight (kg)	1.56 ± 0.75	1.94 ± 0.56
Neonatal/Infant death	21 (30.4%)	2 (2.89%)
Neonatal/Infant death (d)	6.50 (1–28.50)	2 (1.50–1.50)
Adverse neonatal outcome		
Mechanical ventilation	9 (13.04%)	11 (15.94%)
Surfactant	9 (13.04%)	7 (10.14%)
Sepsis	3 (4.34%)	1 (1.44%)
Intraventricular hemorrhage	1 (1.44%)	0
Seizure	1 (1.44%)	0
Periventricular leukomalacia	1 (1.44%)	0

Table 5 (*Continued*)

Parameters	Anomalous twin	Normal cotwin
Postnatal surgery		
Surgical correction	17 (24.63%)	0
Casting and Achilles tenotomy	7 (10.14%)	0
Pacemaker	1 (1.44%)	0

Abbreviations: DC, dichorionic; FGR, fetal growth restriction.

They are alive and healthy at present. The SFD of normal cotwin was because of FGR with Doppler compromise.

The mean birth weight of the fetuses delivered was slightly lower in the case of anomalous twins (1.56 ± 0.75 kg) than in the case of normal cotwins (1.94 ± 0.56 kg). Neonatal/infant death was observed in 30.4% of anomalous twins, with a median survival period of 6.5 days, and 2.89% of normal cotwins, with a two day median survival period. Mechanical ventilation and surfactant were needed in 13.04% of nonlethal cases of anomalous twins and 15.94 and 10.14%, respectively, in normal cotwins.

►**Table 6** describes fetal and neonatal parameters of MC discordant twins. In case of MC discordant twins, converse to

Table 6 Fetal and neonatal parameters of MC discordant twins ($N = 14$)

Parameters	Anomalous twin	Normal cotwin
Gender		
Male	4 (28.57%)	4 (28.57%)
Female	8 (57.14%)	8 (57.14%)
FGR	3 (21.42%)	2 (14.28%)
Single fetal demise (SFD)	3 (21.42%)	0
Gestational age of SFD (wk)	31.67 ± 2.89	0
Birth weight (kg)	1.73 ± 0.75	1.76 ± 0.46
Neonatal/Infant death	4 (28.57%)	0
Neonatal/Infant death (d)	10.50 (0.75–15.25)	0
Adverse neonatal outcome		
Mechanical ventilation	3 (21.42%)	3 (21.42%)
Surfactant	0	1 (7.14%)
Sepsis	0	1 (7.14%)
Postnatal surgery		
Surgical correction	3 (21.42%)	0

Abbreviations: MC, monochorionic; FGR, fetal growth restriction.

DC discordant twins, females were seen in the majority among anomalous and normal cotwins with 57.14%. FGR was observed in 21.42 and 14.28% of anomalous and normal cotwins, respectively. SFD was seen only in 21.42% of anomalous twins with a gestational age of 31.67 ± 2.89 weeks. NND was also observed in 28.57% of anomalous twins with a median survival period of 10.5 days. None of the normal cotwins had a SFD or neonatal death. Birth weight was found to be 1.73 ± 0.75 and 1.76 ± 0.46 kg in anomalous and normal cotwins, respectively. A total of 21.42% of both the anomalous and normal cotwins needed mechanical ventilation.

Discussion

Our study carried out to determine the incidence and profile of discordant twin pregnancies with major structural anomalies reported an incidence of 1.76 and 1.45% in DC and MC twins, respectively, which is in agreement with a large population based study carried out in California by Rand et al, who reported an incidence of 1.5%.[17] Our study findings of baseline characteristics are in line with a retrospective study conducted in Canada by Hiersch et al in terms of maternal age (33.8 ± 5 years), proportion of DC and MC twins (79 and 21%, respectively), and gestational age at delivery (35.6 ± 2.4 weeks).[18]

Major structural anomalies among DC twins were musculoskeletal anomalies (23.19%), with the most common anomaly being talipes equinovarus (11.5%). In the case of MC twins, it was central nervous system anomalies (35.71%), with the major anomaly being anencephaly (14.2%).

Genetic counseling was provided for all women, although only 18.84% of DC pregnancies and 14.29% of MC pregnancies opted for amniocentesis, followed by chromosomal microarray testing. All cases were reported to be normal. The rest of the women chose not to perform amniocentesis either because of personal choice, advanced gestational age at diagnosis, or to avoid the risks of complications to the cotwin.

The majority of women opted for expected management (98.5%) in the DC group and 92.86% in the MC group. Only one case in each group opted for SFR. For women with DC pregnancy after SFR at 22 weeks, the pregnancy continued uneventfully and delivered at 32 weeks (spontaneous labor). In the MC pregnancy, after SFR at 16 weeks, there was a miscarriage at 18 weeks. Because of fewer SFR cases, no conclusion could be drawn for perinatal outcomes after SFR.

Previous studies demonstrated the association between perinatal mortality and severe malformations.[19] In our study, SFD in DC twins was observed in 18.8% of anomalous twins and 4.34% in normal cotwins. However, in the MC group, there was no association between the death of anomalous twins and that of normal cotwins. The mean gestational age at delivery was 33.96 ± 3.56 years in DC pregnancies and 32.43 ± 5.3 weeks in MC pregnancies. Preterm delivery was observed in 71% of both groups. A study by Fernandes et al[20] quoted the gestational age of delivery at 34.9 weeks, which was comparable with our study.

In the DC group, 24.63% underwent surgical correction, 10.14% used cast and Achilles tenotomy for correction of talipes equinovarus, and 1.4% used an inserted pacemaker for heart block (a case of Sjogren's syndrome with anti-Ro/La positive). In the MC group, 21.42% underwent surgical correction. Half of the survivors with structural anomalies underwent surgery. Many of these infants are still under follow-up and will need long-term care.

The live birth rates of anomalous twins in DC and MC twins were 79.7 and 64.29%, respectively, which was comparable with results from Homatter et al[21] for the DC group (82%). Our study showed a better live birth rate in the MC group than Rustico et al (46%).[22] In our study, a higher live birth rate of normal cotwins was observed in both DC and MC groups, 92.7 and 85.7%, respectively. On the contrary, it was 74% in the MC group in the study of Rustico et al.[22] Since the live birth rate of anomalous and normal cotwin pregnancies are above 75%, expectant management among discordant twins with major structural anomalies is a safe option. The same was concluded by a retrospective study conducted by Linskens et al, which further strengthens the study.[5]

The survival rate for anomalous twins was higher in DC than MC twins, that is, 47.82 and 35.7%, respectively. Among normal cotwins, survival was greater in our study (89.8 and 85.7% in DC and MC twins, respectively). A previous author stated 32% survival in anomalous twins and 71% in normal cotwins (MC twins).[22]

The current study has the strengths of having an adequate sample size and division of twins with anomalies according to chorionicity. A previous author[20] did not divide anomalies

according to chorionicity. Confounding factors such as TTTS, TRAP, and TAPS, which are specific to an MC pregnancy and can affect the perinatal outcome, were excluded. Our hospital is a tertiary referral center with a multidisciplinary team, and we could follow up on the postnatal outcomes of the babies.

The limitation is that no comparison was reported statistically between the chorionicity due to unequal sample size. We encourage future studies to conduct prospective studies comparing the maternal and neonatal outcomes between the chorionicity and between pregnancy complications to further strengthen the evidence in the management of twin pregnancies with major structural anomalies.

Conclusion

Our study concludes a low incidence of discordant twins with major anomalies and reported various structural anomalies found in DC and MC discordant twins. Our study underlines that expectant management can be a safe option in DC discordant pregnancies. In MC twins, although the expected management had a good perinatal outcome, the number of cases was small to allow any definitive conclusions on the best approach. Although nearly half of the survivors with structural anomalies did not undergo surgery, many of these infants are still under follow-up for long-term care. We encourage prospective studies to compare maternal and fetal outcomes among expectant management and after SFR between DC and MC twins to further strengthen our conclusions.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author, Dr. Suseela Vavilala, upon reasonable request.

Authors' Contributions

Conception and design: T.Z.B.
Analysis and interpretation of the data: S.V., T.Z.B.
The drafting of the paper: G.K., K.K., S.R., P.R., A.S., S.P., M.K., R.S.
Revising it critically for intellectual content: T.Z.B., S.V.
The final approval of the version: S.V.

Funding

None.

Conflict of Interest

None declared.

Acknowledgments

The authors would like to thank their department for their extended support and help in gathering the data for the study. The authors also express their gratitude to the co-guide team for helping in data analysis.

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