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Research Article

Timing and Mode of Delivery in Twin Pregnancy

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Abstract

Introduction: The development of fertility treatments has increased the incidence of multiple pregnancies to 2% to 3% of all births. Multiple pregnancy is a high-risk condition, with increased mortality and morbidity rates for both mothers and babies. High-quality antenatal care is needed to enhance outcomes and minimize complications. Twin deliveries are a significant obstetrical dilemma because scheduling and mode of delivery have not been optimized.

Purpose: The purpose of this study was to determine the timing and mode of delivery in twin pregnancies in a tertiary care hospital.

Materials and Methods: This prospective, population-based, cross-sectional study included all women with twin pregnancy who delivered at the Department of Obstetrics and Gynaecology at Homerton University Hospital, London, from April 2013 to March 2014 after completing at least 24 weeks of gestation. Age, body mass index, parity, smoking status, method of conception and type of twin pregnancy were recorded, as were the timing and mode of delivery of both twins.

Results: A total of 102 twin pregnancies were recorded during the study period, with an overall incidence of 2%. Seventy-eight pregnancies met the inclusion criteria. Modes of delivery of twin 1 were spontaneous vaginal (31%), instrumental (9%) and cesarean section (60%). Modes of delivery of twin 2 were spontaneous vaginal (19%), instrumental (6%), breech delivery (12%) and cesarean section (63%), including 2% requiring an emergency cesarean section. Of these women, 10% delivered between 24 and 28 weeks, 26% between 29 and 34 weeks and 63% between 35 and 38 weeks, with 1% allowed to complete 39 weeks before planned delivery.

Conclusion: Twin pregnancies carry high risks of significant prematurity < 34 weeks and cesarean delivery.

Keywords: *Multiple Pregnancy; Mode of Delivery; Gestational Age*

Introduction

The development of fertility treatments has increased the incidence of multiple pregnancies, to 2% to 3% of all births [1,2]. Multiple pregnancy is a high-risk condition associated with increased mortality and morbidity rates in both mothers and babies. High-quality antenatal care is needed to enhance outcomes and minimize complications. During the early stages of pregnancy, efforts are made to ascertain chorionicity and detect fetal abnormalities and complications. During the third trimester, antenatal care includes the identifying and managing conditions associated with preterm birth, growth retardation and maternal complications, as well as choosing the optimal mode of delivery [3]. Twin deliveries are a significant obstetrical dilemma because scheduling and mode of delivery have not been optimized [4]. Higher perinatal mortality in second twins has been linked to stillbirth or complications during delivery [5]. Moreover, poor outcomes during normal birth were associated with a >20-minute interval between the delivery of twins [6]. The rate of perinatal death occurring later than 32 weeks of gestation was greater for monochorionic twins (2.1%) than for dichorionic twins (0.35%) [7]. Nearly all prenatal deaths occurred after 37 weeks of gestation, indicating that delivery of monochorionic twins be scheduled at 36 weeks [7].

Approximately 60% of twin pregnancies result in spontaneous birth prior to 37 weeks of gestation. Planned deliveries at 36 weeks in women with straightforward monochorionic twin pregnancies and 37 weeks in women with straightforward dichorionic twin pregnancies have shown no association with increased probabilities of grave consequences. Nevertheless, continuing uncompromised twin pregnancies past 38 weeks has been associated with a higher incidence of fetal mortality [2]. Timing of twin births should be planned by balancing the advantages of continuing a pregnancy and the prospects of stillbirth [8]. Maternal and fetal complications of twin pregnancies include ruptured membranes, maternal hypertension, preeclampsia, twin to twin transfusion syndrome (TTTS) and abnormal fetal test results, as determined by cardiotocography, biophysical profiles or umbilical artery Doppler. Pregnancies are regarded as complicated and interventions warranted when the estimated weight of either twin is below the tenth percentile for gestational age and when the birth weight discrepancy between the two twins exceeds 20% [9]. The purpose of this study was to assess the timing and mode of delivery in twin pregnancies in a tertiary care hospital.

Materials and Methods

This study was performed at Homerton University Hospital London, an *in vitro* fertilization (IVF) center and tertiary care hospital with a neonatal intensive care unit. All women with twin pregnancies booked in the antenatal clinics or referred from secondary care hospitals were recruited. Women having miscarriages or delivering before the age of viability (24 weeks) were excluded, as were women having triplets and higher-order multiples. Twin pregnancy and chorionicity were determined by standard criteria on ultrasound scans, including the number of placentae, the presence of a lambda or T-sign, or the thickness of intertwined membranes, performed at 11 to 13 weeks (+6 weeks) of gestation. Women bearing in monochorionic twins underwent fortnightly scans between 16 to 24 weeks of pregnancy to detect TTTS, followed by scans every three weeks until delivery to monitor fetal growth. Beginning at week 24, women bearing dichorionic twins underwent scans every four weeks to monitor fetal growth. Induction was offered to women bearing monochorionic twins at 36 weeks, provided the first twin was cephalic and to women bearing dichorionic twins at 37 weeks. During labor, both twins were subjected to continuous fetal monitoring. An experienced obstetrician was present at each delivery.

The medical records of these women were reviewed in detail and entered onto a preset proforma. These data included demographic characteristics, method of conception, type of twin pregnancy, maternal and fetal complications, gestational age at delivery and mode of delivery of twins 1 and 2 and the interval between the delivery of twins. Data were processed on Microsoft Excel and expressed as number (percent).

Results

Between April 2013 and March 2014, there were a total of 5176 deliveries at our center, including 102 twin and six triplet deliveries. The overall incidence of multiple pregnancies was 2.01% and the overall incidence of twin pregnancies 1.97%. Seventy-eight twin pregnancies (1.51%) met the inclusion and exclusion criteria and were evaluated.

Most women (89%) were aged 21 to 40 years, whereas 1% were aged < 20 years and 10% aged > 40 years. About 49% were primigravidae, 35% were P1-4 and 16% were grand multiparous. In addition, 18% were obese (BMI > 30 kg/m^2) and 25% were smokers or ex-smokers. Just over one-third conceived by IVF treatment and 5% used donor eggs. Most (80%) of the twin pregnancies were dichorionic. Fifteen percent of women developed pregnancy induced hypertension and 11% were diagnosed with gestational diabetes mellitus. Of these twin pairs, 20% had selective intrauterine growth retardation (IUGR), 1% developed TTTS and delivered at 27 weeks by cesarean section. One percent experienced feticide of one twin due to multiple congenital abnormalities.

According to National Institute for Health and Care Excellence (NICE) guidelines, the delivery of dichorionic twins was planned at 37 weeks and the delivery of monochorionic twins at 36 weeks after administration of steroids. Assessment of gestational age at delivery showed that the incidence of significant prematurity was high, with 36% of women delivering before 34 weeks (Figure 1).

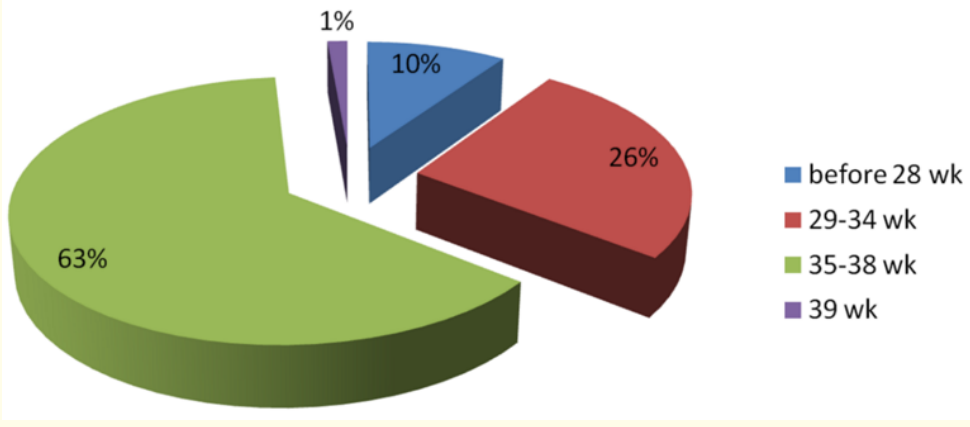

Figure 1: *Distribution of gestational age at delivery.*

The main reasons for prematurity were the onset of spontaneous labor, elective delivery for selective IUGR, preeclampsia and TTTS. This resulted in a high rate of admission to the neonatal intensive care unit and increased neonatal morbidity and mortality rates.

Modes of delivery of the first and second twins are shown in table 1 and indications for cesarean section in table 2. The main reasons for cesarean section were the first twin being in a breech position, previous cesarean section, fetal distress and failure to progress.

Mode of delivery	First twin, n (%)	Second twin, n (%)
Spontaneous	24 (31%)	15 (19%)
Instrument	7 (9%)	5 (6%)
Breech assisting	0	9 (12%)
Cesarean section	47 (60%)	49 (63%)
Total	78 (100%)	78 (100%)

Table 1: *Mode of delivery.*

Elective cesarean section, n (%)		Emergency cesarean section, n (%)	
Twin 1 breech	10 (12.8%)	Twin 1 breech in labor	7 (9.0%)
Maternal request	4 (5.1%)	IUGR preterm	8 (10.3%)
Previous cesarean	3 (3.8%)	Uterine scar in labor	2 (2.6%)
HIV positive	1 (1.3%)	Fetal distress	4 (5.1%)
		Failure to progress	4 (5.1%)
		Preeclampsia preterm	2 (2.6%)
		TTTS preterm	1 (1.3%)

Table 2: *Indications for cesarean section.*

Of the 78 pairs of twins, 31 (40%) first twins were delivered vaginally, with 15 (19%) of the corresponding second twins delivered spontaneously, nine (12%) by assisted breech delivery or breech extraction, five (6%) with instruments and two (3%) by cesarean section. The time between delivery of the first and second twins was < 15 minutes in 83% of women, 16 to 30 minutes in 14% and > 30 minutes in 3%. Eighteen women (23%) experienced postpartum hemorrhage, due primarily to uterine atony.

Discussion

The prospective nature of this study eliminates selection bias and the short study period makes it more reliable than studies spanning more than a decade due to continuous advances in medical care. The 2% incidence of twin pregnancy reflects increased rates of IVF and increases in maternal age. Maternal age > 35 years has been associated with higher rates of spontaneous multiple pregnancies. About 50% of twin pregnancies result in preterm delivery, at gestational age < 37 weeks. In this study, one-third of women delivered before 34 weeks. This high incidence of prematurity was associated with complications of prematurity, leading to prolonged admission to the neonatal intensive care unit and perinatal morbidity. The remaining two-thirds of women delivered between 35 to 38 weeks, due either to spontaneous onset of labor or planned delivery in accordance with NICE guidelines of monochorionic twins at 36 weeks and dichorionic twins at 37 weeks.

The ideal timing of birth for women with an otherwise uncompromised straight forward twin pregnancy remains unclear, with clinical backing for planned delivery at 37 weeks or waiting for spontaneous onset of labor. Guidelines recommend that labor be induced at 41 weeks in singleton pregnancies to reduce perinatal mortality. The risk of perinatal death in twin pregnancies at 37 weeks is equal to that in singleton pregnancies after 42 weeks [10,11]. A Cochrane review identified only two randomized controlled trials of straightforward twin pregnancies comparing elective delivery at 37 weeks with conservative management [12]. These trials, which included 271 women and 542 infants, found no statistically significant differences in between-group rates of unwanted outcomes, including cesarean delivery and serious maternal and perinatal morbidity and morbidity.

Mode of delivery poses another problem in twin pregnancy. Delivery should be based on approved principles, such as the presentation of the leading twin (cephalic in 70%, breech in 30%) and ascertainment of normal fetal growth and well-being. In the present study, 60% of deliveries were by cesarean section. This was largely due to malpresentation of the first twin and selective IUGR specific to twins. Other indications, such as failure to progress and fetal distress, can also occur in singleton pregnancies. Women who had previously delivered by cesarean section, along with their obstetricians, were reluctant to choose vaginal birth after cesarean section. Vaginal delivery was offered to women with uncomplicated twin pregnancies and the first twin in the cephalic position, with 17 (22%) of these women choosing induction. A large randomized trial comparing delivery plans for twins of gestational age 32 to 38 weeks in a well-equipped hospital with resources for fetomaternal monitoring and neonatal resuscitation found that planned cesarean did not decrease the risks of perinatal morbidity or mortality for the first twin [13]. The second twin had a greater risk of poor outcome than the first twin, but this was not reduced by cesarean section.

A secondary analysis of a worldwide survey by the World Health Organization examining outcomes of multiple pregnancies in low and middle-income countries found that twin pregnancy was an important risk factor for poor outcomes in low-resource countries [14]. Timely and safe cesarean section may, therefore, be the safest mode of delivery in twin pregnancies in low and middle-income countries. Improved obstetric care during multiple pregnancies, particularly appropriate access to safe cesarean section, is needed to reduce maternal and perinatal risk [14]. Planned elective cesarean section may reduce the likelihood of perinatal death by up to 75% compared with normal delivery, primarily by reducing the risks of metabolic acidosis and hypoxia, particularly to the second twin [15,16].

Conclusion

The antenatal management and delivery associated with a twin pregnancy are highly challenging. Twin pregnancy is associated with higher risks of maternal and perinatal complications. Half of twin pregnancies result in premature delivery due to the spontaneous onset of labor or iatrogenic intervention. There is a high incidence of cesarean section due to fetal malpresentation, IUGR, intrapartum fetal distress and failure to progress.

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