

## Twin births and their complications in women of low socioeconomic profile

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### Abstract

**Objective:** To determine the frequency of twin births and their foetomaternal complications in women of low socioeconomic profile.

**Methods:** The cross-sectional study was conducted from January 2009 to December 2010 at the Obstetrics and Gynaecology Unit I, Civil Hospital, Karachi. Patients with twin pregnancy giving birth beyond 24 weeks, were selected by non-probability purposive sampling. Data on patient characteristics, gestation, antepartum and peripartum complications, chorionicity, mode of delivery and perinatal outcome was recorded and analysed through SPSS 16.

**Results:** Out of 6077 deliveries during the study period, 119 twin births gave a frequency of 19.58/1000 births. Patients' mean age was 27.51±4.2 years, mean parity 2.4±2.2 and mean gestational age was 34.76±3.4 weeks. Unbooked and referred patients were 96 (80.67%).

Final paired outcome was alive twin pairs in 74 (62.18%) cases, stillbirth in 7 (5.88%), neonatal deaths in 10 (8.40%). Perinatal mortality rate was 277/1000 twin births. Most frequent foetal complications were low birth weight (n=84; 70.58%), pre-term births (n=70; 58.82%) and intrauterine growth restriction (n=59; 49.57%). The second twin was at significantly higher risk ( $p < 0.05$ ). Monochorionic twins had significantly high rates of stillbirths than dichorionic ( $p = 0.023$ ). Most frequent maternal complications comprised pre-term labour (n=56; 47.05%), severe anaemia (n=22; 18.48%), hypertensive disorders (n=19; 15.96%) and postpartum haemorrhage (n=10; 8.40%).

**Conclusion:** Twin pregnancies in women of low socioeconomic profile result in very high rates of low birthweight, pre-term births, intrauterine growth restriction, anaemia, hypertensive disorders and postpartum haemorrhage. Monochorionic pregnancies result in high rates of stillbirths and second twin is more likely to be compromised.

**Keywords:** Multiple pregnancy, Perinatal mortality, Low birthweight, Preterm births, Stillbirths, Foetal growth restriction, Monochorionic. (JPMA 62: 1204; 2012)

### Introduction

Multiple pregnancy is a high-risk situation because of its inherent risks to mother and the foetus. Twin or multiple pregnancies are gaining importance worldwide because of rising incidence attributable to assisted reproductive technologies. Incidence of Twin pregnancy varies worldwide. In USA it has been reported constant as 32/1000 births,<sup>1</sup> whereas the incidence of high order multiples is 147/100000 livebirths. In the United Kingdom, twin pregnancy rates are 14.7/1000 maternities. Japan has the lowest incidence 4/1000, whereas African countries have higher incidence of twins, up to 54/1000 births reported from Nigeria.<sup>2</sup> Perinatal mortality is four times higher in twins and six times higher in triplets. The rate of monozygotic twins is almost constant worldwide at 3.5/1000 births.<sup>3</sup> According to local studies, reported frequency of twin births varies from 16-17/1000<sup>4,5</sup> to 31.7/1000.<sup>6</sup> Research evidence has demonstrated controversial links between adverse perinatal outcome and

chorionicity.<sup>7-10</sup> Twin pregnancies are associated with increased foetal loss, structural abnormalities and intrauterine growth restriction (IUGR). Twin pregnancies are associated with increased risk of pregnancy-induced hypertension, anaemia, antepartum and postpartum haemorrhage and maternal death besides the foetal and neonatal risks of pre-term births, low birth-weight and increased perinatal mortality. Foetomaternal health outcomes of multiple pregnancies influence healthcare costs and quality of life for parents and children.<sup>11</sup> Complications associated with twin pregnancy result form exaggerated physiological response, over-distension of uterus, hyperplacentosis and unique problems posed by monochorionic placentation. Complications in intrapartum and postpartum period include dysfunctional labour, locked twins, operative vaginal delivery, increased chances of caesarean delivery and postpartum haemorrhage (PPH). Evidence has shown that the second twin is more at risk of perinatal death following the birth of the first. International studies have demonstrated it even irrespective of

chorionicity,<sup>12,13</sup> presentation and infant gender.

Civil Hospital Karachi receives patients from across the metropolitan as well as from the interior of Sindh, Hub and rural Balochistan. Patients from these areas belong to lower socioeconomic strata and different ethnicities. There has been no study done at any public-sector hospital of Karachi. Local work is not extensive on these high-risk pregnancies. This study was conducted prospectively and analysis was also done for perinatal mortality and morbidity in the first and second twin separately. It will be helpful in devising strategies for counteracting the associated morbidities and mortalities in a disadvantaged population catered to by public-sector hospitals.

### Subjects and Methods

Cross-sectional analytical study was done from January 2009 to December 2010 at the Obstetrics and Gynaecology Unit I, Civil Hospital Karachi. Conducted prospectively, the study comprised patients of all parity with twin pregnancy beyond 24 weeks, admitted in labour or delivered for obstetric or medical indication. The sample size was calculated by OpenEpi version 2 calculator taking anticipated frequency 5.4%<sup>2</sup> which yielded a sample size of 79. This proportion was used because it gave larger sample size than all other frequencies quoted in local and international studies.<sup>2,5,6</sup> Non-probability purposive sampling technique was employed to select patients meeting the inclusion criteria admitted in the labour room in our unit. Informed consent was obtained. Higher order multiples and twin pregnancies who were discharged antenatally were excluded. Data was collected on a purpose-designed semi-structured proforma on which patient's demographic data, risk factor for twin pregnancy, gestation, chorionicity, haemoglobin, mode of delivery, antepartum, intrapartum and

postpartum complications comprising severe anaemia, pregnancy-induced hypertension, pre-eclampsia, eclampsia, antepartum haemorrhage due to placenta previa and abruptio placentae, postpartum haemorrhage, maternal death, birthweight, APGAR, neonatal intensive care admission (NICU), and perinatal outcome were recorded. Patients were followed up after one week of delivery to record early neonatal deaths within the first 7 days.

Stillbirth was defined as babies weighing  $\geq 500$  gram who did not show any sign of life at birth i.e. heartbeat, respiration, umbilical cord pulsation.<sup>14</sup> Neonatal death was defined as death of a baby within the first seven days of life. Perinatal mortality rate (PNMR) was defined as number of stillbirths and neonatal deaths within seven days of life per thousand livebirths and stillbirths.<sup>15</sup> Intrauterine growth restriction (IUGR) was defined as babies weighing below 10th centile for gestational age.<sup>16</sup>

Data was entered and analysed through SPSS version 16. Mean with standard deviation was calculated for continuous variable i.e. age, parity, gestation. Frequency and percentages were calculated for categorical variables i.e. stillbirths, neonatal deaths, low birthweight categories, and maternal outcome variables. Subsequent analysis of foetal outcome measures for twin 1 and 2 was done by McNemar test. Furthermore, significance testing for PNMR of twin 1 and 2 and for stillbirth proportions for monochorionic and dichorionic pregnancies was done by chi square test on proportions. Level of significance was  $p \leq 0.05$ .

### Results

There were 6077 total deliveries at the unit during the study period. Of them, 119 were twin births, giving a

**Table-1: Patient characteristics, gestation and maternal complications.**

Age Groups	n= 119	(%)	Antepartum Complications	n=119	(%)
Age in years.					
<20	1	(0.80)	Anaemia	47	(39.49)
20-24	20	(16.80)	Severe Anaemia**	22	(18.48)
25-29	48	(40.33)	Hypertensive disorders of pregnancy***	19	(15.96)
30-34	39	(32.80)	Antepartum haemorrhage (APH)	7	(5.88)
35-39	11	(9.20)	Polyhydramnios	2	(1.68)
40 & above	0		Pre-term labour	56	(47.05)
Parity			Peripartum Complications		
Primipara	27	(22.68)	Dystocia/Obstructed labour	7	(5.88)
Para 1-4	72	(60.50)	Cord prolapse	2	(1.68)
Para $\Rightarrow$ 5	20	(16.80)	Locked twins	1	(0.84)
Gestation (Weeks)			Retained second twin	4	(3.36)
			Postpartum haemorrhage	10	(8.40)
24-28	7	(5.88)			
29-32	25	(21)			
33-36	38	(31.93)			
$\geq 37$	49	(41.18)			

\*\* Haemoglobin < 7g/dl. Out of these nine presented with anaemic cardiac failure.

\*\*\* Included Eclampsia 3.36% (n=4) and pregnancy-induced hypertension and pre-eclampsia 12.60% (n=15).

**Table-2: Foetal outcome measures with comparison between Twin I and II.**

Perinatal Outcome Measures	Twin I		Twin II		Total		p- value**
	n=119	(%)	n=119	(%)	n=238	(%)	
Alive	91	(76.47)	81	(68.06)	172	(72.26)	0.064
Stillbirth	12	(10.08)	15	(12.60)	27	(11.34)	0.581
Neonatal Death	16	(13.44)	23	(19.32)	39	(16.38)	0.167
Perinatal Mortality Rate	235.29/1000	319.32/1000	277.31/1000	<0.0005***			
APGAR < 7 at 5 minutes*	12	(11.21)	25	(24.03)	38	(18.00)	0.031***
Neonatal Intensive Care Admission Rate*	36	(33.64)*	59	(56.73)*	95	(45.02)*	0.005***
Birth Weight							
Mean Birth Weight (grams)	2078±640						
	1939±634		0.094				
Low Birthweight (<2500grams)	80	(67.22)	88	(73.94)	168	(70.58)	0.170
500-999	7	(5.90)	8	(6.72)	15	(6.30)	0.250
1000-1499	13	(10.92)	18	(15.12)	31	(13.02)	1.000
1500-1999	21	(17.64)	28	(23.52)	49	(20.58)	1.000
2000-2499	39	(32.77)	34	(28.57)	73	(30.67)	0.596
≥2500	39	(32.77)	31	(26.05)	70	(29.41)	0.230
IUGR†	50	(42.01)	68	(57.14)	118	(49.57)	0.028***

\*Rate calculated out of total babies initially delivered alive i.e 107 twin I, 104 twin II, total 211 babies and p value calculated for pairs initially delivered alive i.e 99 pairs.

\*\*p- value calculated by McNemar test. for all variables except for Perinatal mortality rate and birthweight, which were calculated by Chi square test & two sample t test respectively.

\*\*\*Significant difference.

† Figure for twin 1 & 2 include 39 cases in which both twins were affected.

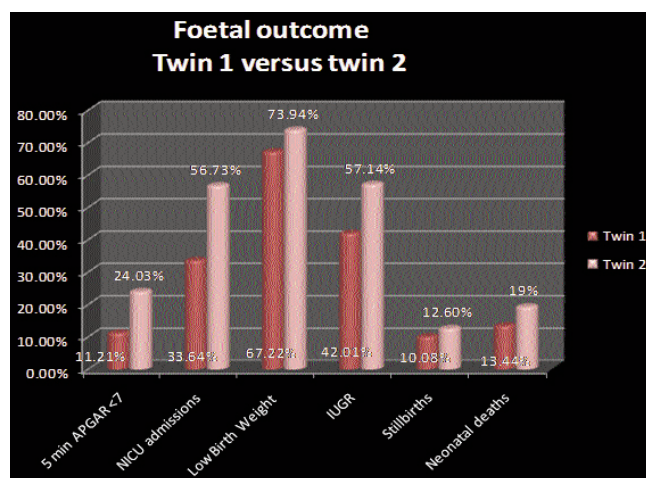


Figure: Comparison of foetal outcome between Twin I and Twin II.

frequency of 19.58/1000 births. Unbooked patients were 84 (70.58%), referred cases 11 (9.24%) and booked cases were 24 (20.16%).

Among the identified risk factors for multiple pregnancy, family history (n=25; 21%) and consanguineous marriage (n=24; 20.16%) were the most frequent risk factors. In only one case, pregnancy followed ovulation induction with clomiphene citrate, whereas 18 (99.16%) twin pregnancies had resulted from spontaneous conception.

Mean age was 27.51±4.2 years (Table-1). Most

frequent age group was 25-29 years (n=22; 37.93%). Mean parity was 2.4±2.2. Most frequent parity group was para 1-4, (n=33; 56.89%). Median parity was 2 and mode was parity 1.

Mean gestational age was 34.76±3.4. Pre-term labour was reported in 56 (47.05%). Pre-term birth rate was 58.82% (n=70) as 14 cases had iatrogenic pre-term delivery for medical/obstetric reason.

Analysis of chorionicity revealed 70.58% (n=84) twins as dichorionic, and 29.48% (n=35) monochorionic, including 1 (0.84%) case of monochorionic monoamniotic.

Presentation combinations for first and second twins were cephalic-non cephalic in 37.8% (n=45), cephalic-cephalic in 25.2% (n=30) and non-cephalic first twin in 37% (n=44). The leading twin was cephalic in 63% (n=75) cases.

Mode of delivery was caesarean section in 43.69% (n=52), whereas 56.30% (n=67) patients delivered vaginally. Out of twin vaginal deliveries, 10.08% (n=12) were operative vaginal deliveries.

The foetal outcome in terms of first and second twin were noted separately (Table-2, Figure). Initially 83.19% (n=99) pairs delivered alive. Later, neonatal deaths led to final paired outcome of alive twin pairs in 62.18% (n=74), stillbirth 5.88% (n=7) twin pairs, stillborn and neonatal death combination in 3.36% (n=4) and another 8.40% (n=10) were paired neonatal deaths. So in 17.64% (n=21) cases, there was no take-home baby. One member loss occurred in 20.16% (n=24) i.e Single member stillbirth in

7.56% and neonatal death in 12.60%. Overall stillbirth of one or both members occurred in 16.80%, (n=20 pairs), whereas neonatal death of one or both members occurred in 24.36% (n=29 pairs). Total 66 perinatal deaths contributed to PNMR of 277/1000 twin babies. Thirteen out of 27 stillbirths were in monochorionic twins. Analysis of stillbirths according to chorionicity revealed significantly higher proportion (p 0.023) of stillbirths in monochorionic (MC) pregnancies (48.14%; n=13), whereas total MC pregnancies were 29.41% (n=35).

Proportion of perinatal deaths (out of total 66) were higher in second as compared to first twin i.e 57.57% versus 42.42%, and the PNMR of second twin was significantly higher (p <0.0005).

Most frequent foetal complication was low birthweight, which affected 70.58% (n=168) babies comprising 67.22% (n=80) twin I and 73.94% (n=88) twin II. IUGR affected 49.57% (n=118) babies. It affected both twins in 24.35% (n=29) cases; only twin I in 18.48% (n=21) cases; and only twin II in 32.77% (n=39) cases.

In terms of maternal complications, severe anaemia (defined as haemoglobin <7 gram/dl) was found in 18.48% (n=22) cases. Out of 39.49% (n=47) patients with anaemia (Hb <10g/dl), the 7.56% (n=9) were admitted in a state of cardiac failure secondary to anaemia, and two of them had concomitant peripartum cardiomyopathy. Hypertensive disorders of pregnancy comprised pregnancy-induced hypertension (PIH)/Pre-eclampsia 12.60% (n=15), and eclampsia 3.36% (n=4). Among peripartum complications, postpartum haemorrhage was the leading complication followed by dystocia and retained second twin.

## Discussion

Majority (n=69; 57.98%) of patients were <30 years of age, which is lower compared to 78.7% for women reported earlier.<sup>5</sup>

The frequency of consanguineous marriage (20.16%) was much higher than reported in a study of 21658 consanguineous marriages, where very low frequency of multiple pregnancy (6.9/1000) was reported.<sup>17</sup> Our observation of only one case of pregnancy following ovulation induction with clomiphene citrate, is explained by the fact that advanced assisted conception technologies is unavailable to lower socioeconomic class and despite that their twin pregnancy rates indicate greater genetic predisposition.

Twin birth frequency of 19.58/1000 in our study results is close to 17.56/1000,<sup>5</sup> and 16/1000<sup>4</sup> reported earlier. In contrast a study from Peshawar<sup>6</sup> reported 37/1000 at gestation >24 weeks which is higher than our results.<sup>6</sup> As compared to international and local studies,<sup>4-6,18</sup> our

patients had lower mean and median gestation of 34 and 36 weeks respectively, whereas 37-week median gestation was reported from Peshawar<sup>6</sup> and 35.9-week mean gestation from Islamabad.<sup>5</sup> Perinatal mortality rate of 277/1000 is higher than reported by a study in Peshawar,<sup>6</sup> and 108/1000 births reported from Islamabad.<sup>5</sup> High PNMR in our study was due to lower gestational age and very high rates of low birthweight. The mean birthweight of our study group neonates was lower than those of studies from Islamabad and Peshawar.<sup>5,6</sup> In our study group, 16 of 27 (59.25%) stillbirths were macerated stillbirths. Analysis of fresh stillbirths revealed that five were caused by anaemic cardiac failure, two by locked twins and one each resulted from eclampsia and diabetes. IUGR contributed to 40.74% (n=11) stillbirths and 25.64% (n=10) neonatal deaths.

MC twin pregnancies showed a significantly high rate of stillbirths than dichorionic pregnancies. Recent international studies have also provided evidence that monochorionic pregnancies are at high risk of adverse outcomes.<sup>19,20</sup> Pre-term birth rates were 58.82% which are very close to rates from the Islamabad study.<sup>5</sup>

Frequency of congenital malformation was 0.84% of cases (tracheoesophageal fistula in one baby and missing tongue in co-twin), and their final outcome was paired neonatal death.

Preterm birth rates were higher at gestation <32 weeks and these were also comparatively higher than reported by the Peshawar study,<sup>6</sup> for the same gestational age group. A total of 14 (11.76%) of pre-term births were iatrogenic, which were indicated for maternal medical or obstetric condition. Mean birthweights were 2078±640 and 1939±634 (p = 0.094) kg for twin I and II respectively. These birthweights were lighter as compared to reported weights in other local studies.<sup>5,6</sup> Rates for low birthweight babies were even higher (70.58%) in our study population compared to reported results from other local studies<sup>5,6</sup> of 43% and 66%. Very low birthweight (0.5<1.5kg) babies were 19.92% (n=46).

Though livebirth, stillbirth and neonatal death rates analysis of matched pair twins by McNemar test showed no significant difference (p>0.05), overall proportion of PNMR for the second twin was significantly higher (p<0.0005) as calculated by Chi square. Similarly IUGR, low APGAR, NICU admissions were significantly higher in the second versus the first twin (p<0.05) This finding is also supported by Western studies which have shown greater predisposition of twin II for adverse outcomes.<sup>12,13</sup>

The rates of low birthweight, IUGR and NICU admission are higher compared to results by the study done in Peshawar.<sup>6</sup> It also reported caesarean rate of 53% which is higher than CS rates of 43% in our study. Our rates are

close to the CS rate (38%) reported from Islamabad<sup>5</sup> and (41%) in a study from Rawalpindi.<sup>4</sup> In our patients, eight women had prior caesarean deliveries (out of them one had previous two and one had previous four CS).

In our findings 37% (n=44) cases had non-cephalic presenting twin as compared to 25% rates quoted from Peshawar.<sup>6</sup> Pre-term labour incidence of 47% in our study is higher than 31% reported from Peshawar.<sup>6</sup>

Our results of hypertensive disorders in 15.96% and total 39.65% cases of anaemia in our study group were quite higher than rates of 7.5% for pre-eclampsia and 32% for anaemia reported from Islamabad.<sup>5</sup> Higher rates of 30-33% for PIH/pre-eclampsia were reported from Faisalabad and Peshawar.<sup>2,6</sup> Among anaemic patients, those who presented with severe anaemia, i.e 18.48% (n=22), nine (40.90%) were admitted with anaemic cardiac failure. In these nine patients, two were diagnosed with concomitant peripartum cardiomyopathy; one of them died. Our results of antepartum haemorrhage (APH) in 5.88% (n=3) cases were in close approximation to a study from Islamabad (4%).<sup>6</sup> There was abruptio placentae in two and placenta previa in one case.

Dystocia/obstructed labour in 5.88% and retained second twin in 3.36% are almost similar to those reported by one study.<sup>4</sup> Postpartum haemorrhage rates of 15-21% reported from Peshawar<sup>6,22</sup> and Rawalpindi<sup>4</sup> are higher than PPH rates (8.40%) in our study group. Limitation of our study is that because of specific admission days of our unit, purposive sampling was employed. Nevertheless it was compensated by taking a sample size that was much larger than the calculated requirement (n=119 instead of n=79) which improves the validity of results and thus the strength of our study.

## Conclusion

Twin pregnancy in women of lower socioeconomic class results in serious foetomaternal morbidities and mortalities. Monochorionic twins are at high risk for stillbirth, while the second twin is at a higher risk of adverse outcomes. Awareness for the need of antenatal care, concerted efforts by community, obstetricians, neonatologists and the presence of comprehensive neonatal intensive care facilities at public-sector hospitals are the key to preventing maternal complications and improving neonatal outcome.

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