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## Research Article

# Evaluation of perinatal outcome in twin pregnancy at tertiary care centre

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### ABSTRACT

**Background:** The objective of present study was to study the incidence of perinatal mortality and morbidity in twin pregnancy and to analyse the various factors influencing perinatal outcome in these cases.

**Methods:** A total of 117 pregnant women with twin pregnancy were analyzed between the period of September 2010 to February 2012. After applying the inclusion and exclusion criteria these women were analyzed with respect to fetal presentation at the onset of delivery, mode of delivery, APGAR score at 1 minute, incidence of perinatal mortality and morbidity rates. Also attempt has been made to define the factors which influence the perinatal mortality and morbidity in twins.

**Results:** In this study it is observed that there is increased incidence of malpresentations 50 (42.7%), increased incidence of congenital malformations (2.6%), increased perinatal mortality (16.7%) and morbidity (21.8%). It is observed that prematurity, i.e. gestational age <37 weeks contributed to 69.9% of total perinatal loss. All perinatal losses except 2 occurred in infants <2 kg. Major factors causing perinatal morbidity were respiratory distress syndrome in (6.4%), transient tachypnoea of newborn (6.4%), septicemia (4.3%), jaundice (3.8%) and anemia (0.9%).

**Conclusions:** It is observed that in this study perinatal mortality and morbidity rates are increased in the event of a twin pregnancy more so for second twin. Early diagnosis of twin pregnancy, regular antenatal visits, identification and anticipation of complications, planned delivery and good NICU care will help to decrease the perinatal morbidity and mortality.

**Keywords:** Twin pregnancy, Perinatal mortality, Perinatal morbidity, Prematurity, Respiratory distress, Septicemia

### INTRODUCTION

Twin pregnancy is the simultaneous development of two embryos in the uterus. Twins are inherently different from singletons by their very nature and are at higher risk of maternal and fetal complications.<sup>1</sup>

The past two decades have witnessed a sharp rise in the incidence of twin and higher order gestations because of the availability and widespread use of ovulation inducing drugs, and the progress and developments in assisted reproductive technology.<sup>2</sup> Significant maternal and neonatal outcome is affected by this increase in twin births. Twin pregnancy imposes greater demand on

maternal physiological system and an increase in occurrence of many complications. Perinatal morbidity and mortality are greater in twins. A high incidence of low birth weight, malpresentations and congenital anomalies are its major causes, low birth weight due to prematurity being the consistent contributing factor.<sup>3</sup> This study intends to know the perinatal outcome in twin pregnancy, management of labour and outcome with regard to fetal morbidity and mortality.

### METHODS

This is a prospective study, done at Vanivilas hospital, Bangalore medical college and research institute,

Bangalore during the period from September 2010 to February 2012, for 18 months which included 117 twin pregnancies. All the twin pregnancies with gestational age  $\geq 28$  weeks were included irrespective of age, parity and associated diseases and complications. Detailed histories regarding twinning in family, symptoms of each complication were recorded in study designed format.

Detailed general, systemic and obstetric examination and routine investigations were done in all women. Clinically suspected cases of twin pregnancies were confirmed by ultrasound examination. Some cases were diagnosed by routine ultrasound examination at 20 weeks of gestation.

When the pregnant lady went into labour, the duration of gestation was recorded. At the onset of labour, detailed per vaginal examination was done to note the cervical dilatation, presentation, position, the level of the presenting part and the type of the pelvis. Necessary precautions were taken to prevent complications during labour. Labour was accelerated by oxytocin whenever indicated.

All vertex-vertex twin pairs without contraindication for vaginal delivery and when first twin was presenting by breech (uncomplicated), they were left for vaginal delivery. In cases where there was contraindication for vaginal delivery, they were taken up for cesarean section. Careful intrapartum monitoring was done.

After delivery of the first baby both abdominal and vaginal examination were done to identify the lie and presentation of the second fetus. If the second baby was presenting by vertex or breech, they were left for vaginal delivery.

In vertex presentation when there was prolonged second stage or maternal or fetal distress babies were delivered by ventouse/outlet forceps. When second twin was in transverse lie, they were tried to deliver by internal podalic version and breech extraction under general anaesthesia. In case of failure they were taken for cesarean section.

Time interval between the deliveries, birth weight, sex, APGAR score at 1 minute, gestational age, congenital anomalies were assessed and recorded. Placentae were examined thoroughly and chorionicity and amniocity were noted. Third stage of labour was managed carefully. Preterm babies were shifted to Neonatal Intensive Care Unit (NICU). Mother and babies were followed till discharge and postnatal complications were noted. The cause of death as well as any associated factors were specifically noted in all the cases of perinatal deaths.

**Following statistical methods were applied in the present study to evaluate the data**

1. Cross tabs procedure (Contingency coefficient test)
2. Chi-square test

## RESULTS

The following data was obtained from the present study

The incidence of twin pregnancy was about 1.1%. Among the total 117 subjects, 40 (34.2%) were booked, rest were unbooked cases.

In the present series 65 (55.6%) cases presented by vertex and 50 (42.7%) had malpresentations. In present series 102 cases (87.2%) had vaginal delivery, 13 cases (11.1%) were delivered by cesarean section.

In 2 cases cesarean section was done for second baby for failed internal podalic version. Mode of delivery is shown in Table 1.

**Table 1: Mode of delivery in the present series.**

Mode of delivery	Number		Percentage	
	I twin	II twin	I twin	II twin
Normal delivery	66	56	56.4	47.9
Assisted breech delivery	23	18	19.7	15.4
Ventouse assisted delivery	14	24	10.00	20.5
Outlet forceps delivery	1	03	0.9	2.6
Cesarean section	13	15	11.1	12.8
Craniotomy	-	01	-	0.9
$\chi^2$ value	104.6	96.4		
P value	0.000	0.000 (Highly significant)		

In 96 (82.1) cases second twin was delivered within 15 minutes of delivery of the first twin. In 15 (2.8%) cases the delivery interval between first and second twins was 16-30 min; 4 (3.4%) cases between 30-60 min and 2 (1.7%) cases it was more than one hour, both resulting in fetal loss.

From Table 2 APGAR at 1 min  $< 7$  was seen in 25.6% of first twins compared to 38.5% of second twins, i.e. low Apgar score was more common amongst the second of the twins as compared to first of the twins.

**Table 2: APGAR at 1 min.**

APGAR score	I twin		II twin		Total	
	No.	%	No.	%	No.	%
0-3	20	17.1	14	12	34	14.5
4-6	10	8.5	31	26.5	41	17.6
$\geq 7$	87	74.4	72	61.5	159	67.9
<b>Total</b>	117	100	117	100	234	100

There were 44 (37.6%) cases of birth weight difference of more than 15% among them 22 (18.8%) had grade I discordancy (15-25%), other 22 had grade II ( $> 25\%$ ) discordancy.

There were 44 (37.6%) cases of monozygotic twins, obtained by placental and blood group studies also corroborates with Weinberg's rule.

Total perinatal mortality in this is 16.7% or 167/1000 live births.

In this study perinatal mortality for unbooked cases was 21.4%, three times higher than booked cases (7.5%) reflects the importance of antenatal care.

Perinatal mortality for vertex was 14.0%, that for breech presentation was 24.1% and for shoulder presentation it is 28.6%. This shows that malpresentations contribute to perinatal loss. The perinatal loss in monozygotic twins (34.1%) was found to be statistically significant when compared to the perinatal loss in dizygotic twins (6.2%).

Perinatal mortality in relation to mode of delivery is shown in Table 3. The highest mortality was for assisted breech delivery, which is about 31.7%. For normal vaginal delivery mortality rate was 17.2%.

**Table 3: Perinatal mortality in relation to mode of delivery.**

Mode of delivery	I twin			II twin			Total		
	Total	PNM	%	Total	PNM	%	Total	PNM	%
Normal vaginal delivery	66	13	19.7	56	8	14.3	122	21	17.2
Assisted breech delivery	23	8	34.8	18	5	27.8	41	13	31.7
Ventouse	14	1	7.1	24	-	-	38	1	2.6
Forceps	1	-	-	3	-	-	4	-	-
Caesarean	13	1	7.7	15	2	13.3	28	3	10.7
Craniotomy	0	0	0	1	1	100	1	1	100
Contingency coefficient value	0.507			0.599					
P value	0.240			0.176					

Gestational age specific twin death, time of fetal death and gestational age specific mortality rate is shown in Table 4. Twin death by birth weight, time of death and

weight specific mortality rate for first twin is shown in Table 5 and for second twin is shown in Table 6 and both combined and shown in Figure 1.

**Table 4: Twin death by gestational age and time of death and gestational age specific mortality rate.**

Gestational age	Total number	IUD*		SB!		END#		Total PNM	Percentage
		I	II	I	II	I	II		
28-32	22	2	3	4	2	8	4	23/44	52.3
32-36	34	0	0	2	3	4	3	12/68	17.6
≥37	61	1	1	1	0	1	0	4/74	5.4
<b>Total</b>	<b>117</b>	<b>7</b>	<b>12</b>	<b>20</b>					

\*Intrauterine demise; !Still birth; #Early neonatal death

**Table 5: Twin death by birth weight, time of death and weight specific mortality rate - I twin.**

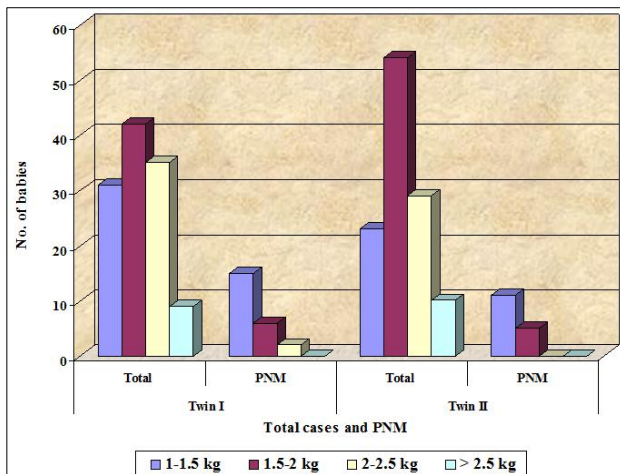
Birth weight (kg)	Total number	IUD*	SB!	END#	Total PNM	%
1-1.5	31	1	3	11	15	48.4
1.5-2	42	1	4	01	06	14.3
2-2.5	35	1	0	01	02	5.7
≥2.5	9	0	0	0	00	0
<b>Total</b>	<b>117</b>	<b>3</b>	<b>7</b>	<b>13</b>	<b>23</b>	<b>19.65</b>
Contingency coefficient value = 0.526; P value = 0.066						

\*Intrauterine demise; !Still birth; #Early neonatal death

**Table 6: Twin death by birth weight, time of death and weight specific mortality rate for II twin.**

Birth weight (kg)	Total number	IUD*	SB!	END#	Total PNM	%
1-1.5	23	2	4	5	11	47.8
1.5-2	54	1	1	3	5	9.3
2-2.5	29	-	-	-	-	0
≥2.5	10	-	-	-	-	0
<b>Total</b>	<b>116</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>16</b>	<b>13.8</b>
Contingency coefficient value = 0.547; P value = 0.043						

\*Intrauterine demise; !Still birth; #Early neonatal death



**Figure 1: Twin death by birth weight, time of death and weight specific mortality rate - I twin and II twin.**

Causes of perinatal mortality in present series are seen in Table 7. 39 perinatal deaths occurred in the present series. The causes are still birth in 11 cases (28.2%), birth asphyxia in 8 (20.5%) cases, septicemia and IUD in 6 (15.4%) cases each, respiratory distress in 7 (17.9%) cases and congenital anomaly in 1 (2.6%) case.

Table 8 shows the incidence of perinatal morbidity. In the present series, 15 babies had respiratory distress syndrome (6.4%), 15 babies (6.4%) had transient tachypnoea of newborn, 10 babies (4.3%) had septicemia, 9 babies (3.8%) had jaundice and 2 (0.9%) had anemia. The overall perinatal morbidity in the present series was 21.8%.

The incidence of congenital malformations was 2.6%. One is a case of hydrocephalus, one is a case of lumbar meningocele, two cases of Ventricular Septal Defect (VSD), one twin to twin transfusion and one acardiac twin.

**Table 7: Causes of perinatal mortality.**

Causes	I twin (117)			II twin (117)			Total (234)		
	No.	%	Valid %	No.	%	Valid %	No.	%	Valid %
IUD	2	1.7	8.7	4	3.4	25	6	5.1	15.4
Still birth	6	5.1	26.1	5	4.3	31.25	11	9.4	28.2
Respiratory distress syndrome	3	2.6	13.0	4	3.4	25	7	6.0	17.9
Septicemia	5	4.3	21.7	1	0.9	6.25	6	5.1	15.4
Birth asphyxia	6	5.1	26.2	2	1.7	12.5	8	6.8	20.5
Congenital anomaly	1	0.9	4.3	0	0	0	1	0.9	2.6
<b>Total</b>	<b>23</b>	<b>19.7</b>	<b>100</b>	<b>16</b>	<b>16.2</b>	<b>100</b>	<b>39</b>	<b>16.7</b>	<b>100</b>

**Table 8: Perinatal morbidity.**

Causes	I twin (117)		II twin (117)		Total (234)	
	No.	%	No.	%	No.	%
Respiratory distress syndrome	7	6.0	8	6.8	15	6.4
Septicemia	6	5.1	4	3.4	10	4.3
Transient tachypnoea of new-born	8	6.8	7	6.0	15	6.4
Jaundice	5	4.3	4	3.4	9	3.8
Anemia	2	1.7	-	-	2	0.9
<b>Total</b>	<b>28</b>	<b>23.9</b>	<b>23</b>	<b>19.7</b>	<b>51</b>	<b>21.8</b>

## DISCUSSION

The incidence of various combinations of presentations in this study is compared with those of other authors in Table 9. The present series findings are comparable with that of Pandole A series.<sup>4</sup>

Regarding the mode of delivery the results of the present series are comparable with that of Pandole A<sup>4</sup> series. All assisted and operative deliveries were more common for the second twin. The only exception was assisted breech delivery which was more common in the first twin (19.7%) compared to the second twin (15.4%).

Table 10 shows the delivery interval between I and II twin by various authors and the present series. In the present series in majority of cases (82.1%) delivery interval was less than 15 minutes.

Comparison of APGAR at 1min is done with Pandole A series.<sup>4</sup> Results are slightly higher in the present study group. Low APGAR score was more common amongst the second of the twins compared to first twin.

Table 11 compares the perinatal mortality of twins in various studies and present series. The rate is lesser compared to other studies, may be due to better neonatal intensive care unit facilities.

**Table 9: Incidence of various combinations of presentations by different authors.**

Authors	Combinations of presentations								
	Vx+Vx	Vx-B	B-Vx	B-B	Vx-T	T-Vx	T-B	B-T	T-T
Chevernak <sup>10</sup>	42.5	26.0	6.0	6.1	11.3	-	-	-	0.6
Tempe <sup>11</sup>	49.7	22.8	12.89	11.18	2.92	-	-	-	0.58
Shailesh Kore <sup>12</sup>	41.87	32.5	8.54	7.44	5.23	-	-	3.03	0.83
Pandole A <sup>4</sup>	57.44	18.08	10.63	7.44	2.65	0.53	1.06	1.59	0.53
Present study	55.6	15.4	10.5	6.8	2.6	0.9	1.7	0.9	-

Vx - vertex, B - breach, T - transverse

**Table 10: Delivery interval between the first and second twins as per different authors.**

Interval (min)	Tempe <sup>5</sup>	Bhatia <sup>8</sup>	Pandole A <sup>4</sup>	Present series
<15	60%	54.6%	59.9%	82.1%
15-30	25%	37.4%	19%	12.8%
31-60	11.5%	6.8%	10.3%	3.4%
≥60	3.5%	1.2%	10.2%	1.7%

**Table 11: Perinatal mortality in twin pregnancy as per different authors.**

Authors	Perinatal death per 1000 live births
Tempe <sup>5</sup>	140.3
Jacob and Bhargava <sup>9</sup>	317
Mitra and Sikdar <sup>13</sup>	240
Saacs et al. <sup>14</sup>	105
Rani <sup>15</sup>	173.8
Spellacy et al. <sup>16</sup>	490
Narvekar <sup>17</sup>	311.3
Present series	167

A comparison of the present study with those of other authors is attempted in order to define the factors which influence the perinatal mortality in multiple gestation.

Table 12 compares the twin deaths as per birth weight in different studies. Perinatal mortality for 1-1.5 kg group is slightly higher than majority of other studies. For other categories it correlates well with that of other studies.

**Table 12: Comparison of twin deaths as per birth weight in different studies.**

Studies	Birth weight in kg			
	1-1.5	1.5-2	2-2.5	≥2.5
Bhatia <sup>8</sup>	83.7%	12.8%	7.4%	4.4%
Tempe <sup>11</sup>	47.22%	4.2%	3.67%	0
Rani <sup>18</sup>	33%	5%	1.9%	2.43%
Pandole A <sup>4</sup>	25.9%	14.4%	4.8%	0
Present series	48.1%	11.5%	3.1%	0

According to Williams<sup>1</sup> approximately 50% of twins deliver at 36 weeks or less and mortality decreases as the gestational age increases. Same holds good for the present study. As measured by both birth weight and gestational age, prematurity is the main factor responsible for higher perinatal mortality rate. Therefore perinatal mortality could be reduced considerably, if we can achieve birth weight of more than 1.5 kg in twins with adequate NICU facility.

In the present study perinatal mortality for malpresentations is significantly higher compared with vertex presentation and is comparable to the study done by Ferguson.<sup>5</sup>

Comparison of twin deaths as per zygosity with other studies is done in Table 13. According to Pandole A<sup>4</sup> the perinatal loss in monozygotic twins is 2.5 times that in dizygotic twins.

**Table 13: Comparison of twin deaths as per zygosity,**

Zygosity	Cameron <sup>19</sup>	Williams <sup>1</sup>	Present study
Monozygotic (PNM%)	26%	82.5%	34.1%
Dizygotic (PNM%)	9%	13.75%	6.2%

**Table 14: Comparison of perinatal mortality in relation to mode of delivery.**

Mode of delivery	Pandole A <sup>4</sup>		Present series	
	1 <sup>st</sup> twin (PNM%)	2 <sup>nd</sup> twin (PNM%)	1 <sup>st</sup> twin (PNM%)	2 <sup>nd</sup> twin (PNM%)
Normal (vaginal)	4.9%	5%	19.7%	14.3%
Assisted breech	63.4%	64%	34.8%	27.8%
Ventouse	-	-	7.1%	0
Forceps	-	10%	-	-
Caesarean	-	-	7.7%	13.3%
Craniotomy	-	-	-	100%

In the present series, mortality rate was higher among unbooked cases (21.4%) compared to 7.5% in booked cases. It was mainly because patients with threatened pre-



term among booked cases were detected and advised admission, bed rest and were given antenatal corticosteroids which probably help fetal survival.

Table 14 compares the perinatal mortality in relation to mode of delivery. The perinatal mortality was high in the present series in all the categories excluding assisted breech delivery category when compared to that of Pandole A<sup>4</sup> series.

Causes for perinatal death in various studies are compared in Table 15.

In the present series in majority, cause of death was respiratory distress syndrome and septicemia as a result of prematurity. Other causes being increased incidence of birth asphyxia, pregnancy induced hypertension and other complications (Table 15).

**Table 15: Comparison of causes of perinatal death.**

	IUD	Still birth	Respiratory distress syndrome	Septicemia	Birth asphyxia	Congenital anomalies
Rani <sup>18</sup>	-	-	16.6%	14.4%	20.6%	-
Mitra and Sikdar <sup>13</sup>	-	-	30.8%	19.2%	23.2%	3.8%
Pandole A <sup>4</sup>	-	3.72%	-	-	-	-
Present series	5.1%	9.4%	6.4%	5.1%	6.8%	0.9%

In the present study, 37.6% of cases had birth weight discordancy of more than 15%. The perinatal death rate among concordant twins was 18.8%. The perinatal death rate among discordant twins with discordancy more than 25% was 37.6%. Pandole A<sup>4</sup> reported that the risk of perinatal death among twins with discordancy of more than 25% was increased 2.5 fold when compared with concordant twins.

The perinatal morbidity in the present series is significantly less compared to other studies,<sup>6,7</sup> may be due to availability of better NICU care.

In the present series, the incidence of congenital malformation was 2.6%, which is comparable to other studies.<sup>8,9</sup>

## CONCLUSION

It is observed that in this study perinatal mortality and morbidity rates are increased in the event of a twin pregnancy more so for the second twin. Early diagnosis of twin pregnancy, regular antenatal visits, identification and anticipation of complications, planned delivery and good NICU care will help to decrease the perinatal morbidity and mortality.

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