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Prospective Observational Study of Maternal and Perinatal Outcome of Twin Pregnancy in a Teaching Hospital

Kajal Kumar Patra[1], Gourisankar Kamilya[2], Shyamsundar Halder[4], Chaitali Sarkar[5]

[1]*Ex. Associate professor, B.S. Medical College, Bankura*
[2]*Professor, IPGME&R, Kolkata*
[4]*PGT, B.S. Medical College, Bankura*
[5]*Clinical Tutor, College of Medicine, Kalyani*
Corresponding Author: Dr. Gourisankar Kamilya
Address: 123, Aelite Housing. 3, Bidhan Sishu Sarani, Kolkata 54.

Abstract: *Objective:The incidence of twin pregnancy has increased largely over the past 30 year. Prevention of preterm labour is the major challenge in the management of multiple pregnancy.Within the last decade a substantial reduction in perinatal mortality has been achieved through advances in neonatal care. Intervention to decrease the neonatal mortality rates in multiple gestations should be directed towards reducing the incidence of low-birth weight infants. However there is still scope of further improvement of perinatal mortality and both maternal & perinatal morbidity.*

Material and methods:This prospective observational study was conducted under the department of Obstetrics &Gynaecology, in a tertiary care hospital of West Bengal. Independent variables of interest studied were gestational age, preterm delivery and mode of delivery.Dependent variables of interest were preeclampsia, premature rupture of membranes, post partum hemorrhage, birth weight, perinatal morbidity and mortality. The singleton mother admitted immediately after the twin was taken as control.

Results: Incidence of twin gestation is higher in multigravida (86.6%)Anaemia was found in 39 (52.0%) mothers with twin gestation. The incidence of pre-eclampsia, preterm labour and postpartum haemohhragw were 14.7%,65.3% and 12% respectively. Prematurity and low birth weight is the most common cause of high perinatal mortality. The mean birth weight of first twin was 1.99 kg. and that of second twin was 1.89 kg. Regarding neonatal complications 32% developed transient tachypnea and 12.7% developed birth asphyxia compared to only 16% and 4% respectively in the singleton group. There was 17.3% perinatal mortality in the twin pregnancy group compared to only 5.3% among singleton mothers. Perinatal mortality is comparatively less, when fetus was delivered in cephalic presentation (4.2% and 13.8% in 1st and second baby repectively) compared to 35.7% and 32.3% in case of breech presentation.With the increase in delivery interval between the first and second twin the incidence of perinatal mortality is gradually increasing.

Conclusion: Inspite of advances in obstetric and neonatology, perinatal mortality in twin pregnancy is alarmingly high. Gestational age, presentation, mode of delivery and birth weight are the significant determinants of perinatal outcome.

Keywords: *Twin, Perinatal morbidity, prenatal mortality*

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I. Introduction

The incidence of twin pregnancy has increased largely over the past 30 year[1]. The reasons for this trend include proliferation of assisted reproductive technologies, increase in the use of ovulation inducing drugs and the rise in maternal age[2,3]. Incidence of twin pregnancy in India is estimated to be 9-16 per 1000 births[4]. Twin gestations comprise approximately 1% of all pregnancies but account for nearly 10% of perinatal mortality[3]. Compared with singletons, twins experience perinatal mortality rates 4 to 10 times higher. Perinatal mortality is strongly associated with birth weight, and in the absence of congenital malformations, the increased risks are driven chiefly by early delivery and fetal growth restriction[2].

Babies born from multiple birth pregnancies are more likely to result in premature birth than those from single pregnancies. 51% of twins and 91% of triplets are born preterm, compared to 9.4% in singleton. 14% twins and 41% of triplets are born very preterm, compared to 1.7% in singletons.

About half of twins are born with a birth weight of less than 2500 gram. However the chances of survival for very small babies are higher than for very small single babies. Twin to twin transfusion syndrome,

is a rare but potentially serious complication in identical twins these days, survival rates are much higher, thanks to early detection and also to laser treatment, which is performed in a few hospitals specializing in this procedure (NICE 2006).

Several studies have shown that, compared with first-born twins, those delivered second carry increased risks of perinatal mortality. In fact, the increased perinatal mortality in second-born compared with first-born twins was evident at every 500-gms birth weight category. These investigators collectively proposed several hypotheses to explain the increased mortality in second-born compared with first-born twins. These included –

- Risk of oxygen deficiency in the second-born twin due to premature separation of the placenta after the delivery of the first twin.
- Reduced placental circulation.
- Increased interval between delivery of the two fetuses, and therefore, increased oxygen deficiency.
- A tendency of macerated fetuses to be delivered after the birth of a liveborn twin.

More frequent breech delivery among second-born twins[2]

Multiples are known to have a higher mortality rate. Multiple pregnancies puts mother at risk of miscarriage, preeclampsia, antepartum haemorrhage, postpartum haemorrhage, Iron and folic acid deficiency anemia, polyhydraminos, preterm labour, premature rupture of membranes and increased rate of caesarean section. Preeclampsia is 2-3 times more common in multiple than singleton pregnancy and likely to be more severe. The overall risk of transfer of the mother of an adult Intensive Care Unit shifts from 0.3% with a singleton pregnancy to 3.1% after a twin delivery is now accounting for 3% of the live births.

Armson*et al*, (2006)[5] concluded that the second twin is the greater risk of adverse perinatal outcome than the first twin, independent of presentation, chorionicity, or infant sex. Planned vaginal delivery, birth weight discordance, and prolonged interdelivery time increase this risk.

Shobha and Rohini (2010)[6] concluded that the perinatal outcome of the second twin was poor when compared to the first twin. Poor perinatal outcome in terms of NICU admissions, neonatal deaths were more in second twin. This may be due to increased prematurity, low birth weight, birth asphyxia and malpresentations in twins. More complications are expected for the second twin compared to the first.

Twin gestation is now an area of vital concern to the perinatologists. Prevention of preterm labour is the major challenge in the management of multiple pregnancy. Within the last decade a substantial reduction in perinatal mortality has been achieved through advances in neonatal care. Intervention to decrease the neonatal mortality rates in multiple gestations should be directed towards reducing the incidence of low-birth weight infants. However there is still scope of further improvement of perinatal mortality and both maternal & perinatal morbidity.

With the above background, the present study was undertaken with the following objectives.

1. To evaluate problems of Twin pregnancy in relation to maternal age, parity, gestational age, foetal presentation and position, method of delivery, interval of births between first and second twins.
2. To plan for optimal method of delivery.
3. To find outcome of twin pregnancy in terms of maternal and fetal morbidity and mortality.

II. Materials & Methods

This prospective observational study was conducted under the department of Obstetrics &Gynaecology, BankuraSammilani Medical College and Hospital, Bankura, West Bengal,with time frame of one and half year. Women with twin pregnancies admitted in Dept. of Obstetrics and Gynecology were the target group for the study.

Inclusion criteria - All women admitted to the ante natal word and labour room after ultrasound diagnosis of twin gestation above 28 weeks of gestation.

Exclusion criteria –

Patient with one fetus delivered outside the hospital.

Patients with fetal congenital anomaly diagnosed by ultrasonography

Patient with twin gestation with one fetal demise

75 women with twin pregnancies admitted during the study period.For each case of twin pregnancy, next case of singleton pregnancy was taken as a control.

Independent variables of interest studied were gestational age, preterm delivery and mode of delivery.Dependent variables of interest were preeclampsia, premature rupture of membranes, post partum hemorrhage, birth weight, perinatal morbidity and mortality.

Ethical clearance for performing the study was obtained from the Institutional Ethics Committee. Informed consent to participate in the study was obtained from all the eligible women.

All the relevant information were recorded like maternal age, parity, detailed history, clinical examination findings, ultrasonography reports, gestational age at birth, fetal presentation during labour, mode of delivery, birth weight and lastly details of any perinatal morbidity or mortality.Outcome parameters were maternal morbidity like antepartum hemorrhage caesarian section, postpartum hemorrhage, perinatal outcome, early neonatal death, preterm baby, low birth weight etc.

Necessary information was collected in a predesigned data sheet finally the findings were put into Microsoft excel version and analyzed by Epi info version 3.5.1 software (Centres for Disease Control and Orevention, Atlanta, GA, USA).

III. Results

The present series of work has been done in the department of obstetrics and gynaecology, BankuraSammilani Medical College and Hospital during the period from January, 2017 to June 2018.

Maternal and Perinantal outcome in 75 cases of twin pregnancy and 75 cases of singletons, each was studied. Age distribution is almost equal in both singleton and twin pregnancy group, except more patients of twin pregnancy group are more in the age group of 30 years and more(Table1). Our study shows that incidence of twin gestation is higher in multigravida. Out of 75 cases of twins, 65 mothers were multigravida (86.66%) while out of 75 cases of singletons 42 were multigravida (56.00%).

Table 2 shows the different pregnancy complication of twin gestation and they are divided among booked and un-booked cases. Patients are considered anaemic when the haemoglobin is below 10.0 gm% and 32 percent packed cell volume. Anaemia was found in 39 (52.0%) mothers with twin gestation. 20 out of 47patients(42.6%) with anaemia were in the booked group and 67.9 percent are anaemic in the unbookedgroup. Hydramnios has been recorded in 10 cases(13.33%).Three mothers suffered from antepartum haemorrhage. Eleven patients developed preeclampsia with anan incidence of 14.66 percent. Among them, 5 were booked cases(10.6%) and 6 were unbooked, an incidence of 21.4 percent. Two patients suffered from eclampsia inunbooked group of twin pregnancies.

Regarding preterm labour, 49(65.3%) mothers with twin gestation developed the complication. It is observed that the incidence of prolapse of the cord is 2.66 percent in multiple pregnancy cases. Nine mothers(12%) suffered frompost partumhaemorrhage and two mothers developed the complication of retained placenta(Table 2). Complications like anaemia, preeclampsia and pre term labour developed more commonly among theunbooked mothers.

Prematurity and low birth weight is the most common cause of high perinatal mortality in twin pregnancy. In our study, the mean birth weight of first twin was 1.99 kg. and that of second twin was 1.89 kg. while that in singleton controls was 2.3 Kg. 56 babies(37.3%) were in the less than 1.5 kg group, compared to only one single patient in the singleton group (Table3). 56% babies were less than 2.5kg in the study group. Regarding neonatal complications 32% developed transient tachypnea and 12.7% developed birth asphyxia compared to only 16% and 4% respectively in the singleton group. There was 17.3% perinatal mortality in the twin pregnancy group compared to only 5.3% among singleton mothers.

Our study (Table 4) shows that out of 75 cases of twin pregnancy, first twin was delivered by breech in 14 cases (18.66%), while second twin was delivered by breech in 31 cases (41.33%). Perinatal mortality is comparatively less, when fetusdeliverd in cephalic presentation(4.2% and 13.8% in 1st and second baby repectively) compared to 35.7% and 32.3% in case of breech presentation. Caesarean section was done in 11 cases of first twin and in 14 cases for the second twin. In the control group 13 out of 75 babies were delivered by caesarean section.

Table 5 showsPerinatal loss of second twin in relation to the delivery interval between first and second twin. With the increase in delivery interval between the first and second twin the incidence of perinatal mortality is gradually increasing. Inspite of advances in obstetric and neonatology, perinatal mortality in twin pregnancy is alarmingly high.

IV. Discussion

With the development of ultrasonic techniques for the evaluation of pregnancy, it has become apparent that the incidence of multiple gestations in humans may be more common than previously indicated.In the past two decades physicians and researchers have emphasized the importance of twin and higher order multiple births to infant morbidity and mortality.Several workers have tried their best to evaluate the various causes of perinatal loss in twin gestationInspite of advances in obstetric and neonatology perinatal mortality in twin pregnancy is alarmingly high.

The present series of work has been done in the department of obstetrics and gynaecology, BankuraSammilani Medical College and Hospital during the period from January, 2017 to June 2018. The positive effects of increasing parity on the incidence of twinning has been demonstrated by Patterson et al[7]. Corroborating with their findings our study shows that incidence of twin gestation is higher in multigravida.

Out of 75 cases of twins, 65 mothers were multigravida (86.66%) while out of 75 cases of singletons 42 were multigravida (56.00%) similar to the study by Singh L et al[8], who have found 70.7% twins are multigravida.

Anaemia, a common complication among mother with twin pregnancy was found in 52 percent. The incidence is further high in the unbooked group of 66.9 percent,compared to the study by Bangal BV[9] et al who have found the incidence is as high as 66%. Multiple pregnancy being a predisposing factor for preeclampsia, our study shows that the incidence of preeclampsia is about14.66% corroborating with the incidence of 18% by Bangal BV[9] et al and 16.6% by Deepthi HR et al[10]. Among them two patients developed complication of eclampsia in the unbooked group. This proves that complication like eclampsia can be avoided by early booking and proper obstetric management, even among mother with twin gestation. Similarly hydramnios and antepartum haemorrhage are more prevalent in twin pregnancy and the incidence being 13.33% and 4.0% respectively

Our study shows that 49 out of 75 cases of twins, accounting for 65.33% cases had preterm delivery, compared to only 14.7% among singleton mother. Akaba GO et al[11]observed preterm delivery in 39.7% of twins similar to the study byNwankwo TO[12] et al (41%) . Similarly the incidence of post partumhaemorrhage is high about12.0% among the mother with twin gestation compared with 8.5% by Nwankwo TO[12] et al and 13.3% by Singh L et al.

Prematurity and low birth weight is the most common cause of high perinatal mortality in twin pregnancy.In our study, 37.3% babies are of less than 1.5kg compared to only 1.3% in the singleton.

Transient tachypnoea of the newborn(TTN) is more prevalent among the babies with twin gestation with the incidence being 32.0% compared to only16% among singleton. The high incidence of TTN can be explained by high incidence of prematurity. Similarly the incidence of birth asphyxia is high 12.8% compared to 4% among singleton. There were 26 perinatal deaths which accounted for 17.3% of total perinatal loss. Most of these babies are of less than 1.5 kg group.In our study, out of 56 babies weighing less than 1.5 kg, there were 26 perinatal deaths which accounted for 46.4% of total perinatal loss similar to the study by Sarojini[13] et al who found 47.8% prenatal mortality among the babies of less than 1.5 kg. Our study (Table 4) shows that out of 75 cases of twin pregnancy, first twin was delivered by breech in 14 cases (18.66%), while second twin was delivered by breech in 31 cases (41.33%) compared to 3.3% and 18.3% by Deepthi HR[10] et al respectively.Compared to cephalic presentation breech presentation resulted in much higher incidence of perinatal mortality both in first and second twin.

Regarding the perinatal loss of second twin in relation to the delivery interval between 1st and 2nd twin, the more is the delivery interval the more chance of poor perinatal outcome of second twin.Konar H et al[14] found that mode of delivery and birth weight are the significant determinants of perinatal outcome of second twin. However Jhaveri RR[15] found that caesarean mode of deliver does not influence neonatal morbidity in second twin.

V. Conclusion

Multiple pregnancy bears additional hazards both for the mother and the baby. Though these hazards are partly preventable, difficulty in timely recognition of multiple pregnancy at an early date is a main obstacle. Once diagnosed, proper antenatal care, nutritional supplement together with thorough intranatal and postnatal vigilance have much to their credit in lowering both maternal and foetal complications.Pretermlabour and intra uterine growth retardation were the two single most important factors responsible for the neonatal deaths.

The perinatal mortality could be reduced considerably if we can achieve birth weight of more than 1.5 kgs in twins. Thus proper antenatal care, planned delivery with shorter interval between deliveries of two babies and better facilities for care of premature babies can bring about a reduction in perinatal mortality of twin pregnancies.

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TABLE:

Table 1. Maternal characteristics between twin and Singleton pregnancy

	Twin	Singleton
Age		
<20 years	8	9
20-30	62	64
>30	5	2
Multigravida	65 (86.7%)	42 (56%)
Preterm labour	49(65.3%)	11 (14.7%)

Table – 2: Showing complications of Twin pregnancy

Complications during pregnancy	Total no. of cases (n=75)	% to multiple pregnancy	Booked cases (n=47)	%	Unbooked cases (n=28)	%
1. Anaemia	39	52.0	20	42.6	19	67.9
2.Preeclampsia	11	14.66	5	10.6	6	21.4
3. Hydramnios	10	13.33	5	10.6	5	17.9
4. Antepartum Haemorrhage	3	4.0	1	2.1	2	7.1
5. Preterm labour	49	65.3	27	57.4	22	78.6
6. Eclampsia	2	2.66	0	0.0	2	7.1
7. Cord prolapse	2	2.66	0	0.0	2	7.1
8. Postpartum Haemorrhage	9	12.0	5	10.6	4	14.3
9. Retained Placenta	2	2.66	2	4.3	0	0
10. VulvalHaematoma	1	1.33	1	2.1	0	0

Table3. Fetal characteristics between Twin and Singleton pregnancy

	Twin	Singleton
Birth weight		
<1.5 Kgs	56 (37.3%)	1(1.3%)
1.5-2.5 Kgs	84(56.0%)	21(28.0%)
>2.5 Kgs	10(6.7%)	53(70.7%)
Transient tachypnea	48(32.0%)	12(16.0%)
Birth Asphyxia	19(12.7%)	3(4.0%)
Perinatal mortality	26(17.3%)	4(5.3%)

Table – 4: Mode of delivery and perinatal mortality in twins and singletons

Twin	1st Twin		2nd twin		Singleton				
	No.	PNM	No.	PNM	No.	PNM			
Normal by vertex	48	2(4.2%)	29	4(13.8%)	57	2(3.5% Breech	14	5(35.7%)	31 10(32.3%) 2 1(50.0%)
Forceps	2	1(50.0%)	1	1(100%)	3	1(33.3%)			
Caesarean section	11	1(9.0%)	14	2(14.3%)	13	0			

Table -5: Perinatal loss of the second twin in relation to the delivery Interval between first and second twin

Delivery interval between 1st and 2nd twin	No. of second twins	%	Still birth	%	Death within 1st week of birth	Perinatal loss	%
Upto 15 minutes	57	76.0	3	5.3	3	6	10.5
16 to 20 minutes	10	13.3	2	20.0	3	5	50.0
21 to 30 minutes	4	5.3	2	50.0	1	3	75.0
31 to 60 minutes	2	2.7	1	50.0	0	1	50.0
More than 60 minutes	2	2.7	1	50.0	1	2	100.0

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