

STUDY OF FETOMATERNAL OUTCOME IN MULTIFETAL GESTATION

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STRUCTURED ABSTRACT: OBJECTIVE: To study the fetomaternal outcome in multifetal pregnancy. **METHODS:** The study was carried out in the department of obstetrics and gynecology, at Sree Mookambika institute of medical sciences, Kanyakumari, Tamil Nadu, from April 2008 to May 2011, a period of 3 years. All multifetal pregnancy either admitted from antenatal clinic as booked cases or from labor room as emergency cases, irrespective of duration of pregnancy were included in the study. During this period there were 5020 deliveries, out of which 48 cases were multiple pregnancies. Out of 48 cases, there were 46 twins and 2 triplets. The study reviewed the outcome of 48 cases of multifetal pregnancy and 4972 singleton pregnancies. **RESULT:** Multifetal gestation was found to be more common in 20-24 year of age. Most of them delivered between 34-36 weeks gestation. The multifetal gestation was associated with increased maternal complications compared to singleton pregnancy (Preterm labor (87.5% vs. 4.06%), PIH (25% vs. 4.04%), anemia (16.6% vs. 10.13%), hydramnios (33% vs. 1.0%), hyperemesis gravidarum (6.25% vs. 2%), APH (4.17% vs. 0.8%), eclampsia (2.08% vs 1.59%).

The perinatal mortality was higher when delivered earlier than 33 weeks of gestation. Prematurity was the outstanding cause of mortality. The mortality was higher in low birth rate babies, higher order births, non-vertex presentation and male fetuses. Conclusion: Multifetal pregnancy is a high risk pregnancy associated with increased maternal complications, perinatal morbidity and mortality compared to singleton pregnancy.

KEY WORDS: Multifetal Singleton

INTRODUCTION: In 1865, Mathew Duncan wrote, "the rarity of plural birth in women and the increased danger to the mother and offspring in these circumstances renders such an event in a certain limited sense a disease or an abnormality".

Multifetal gestation is a topic in obstetrics that has stimulated more interest and literature. Serious efforts have been made to unify all kinds of contribution of multifetal gestation into a new branch of science named Gemellology. The incidence of monozygotic twins is apparently constant 3.5/1000 throughout the world. But the frequency of dizygotic twinning is influenced by maternal factors. The incidence of multifetal gestation has increased with ovulation induction and ART. The increase in the number and rate of higher order multiple births in the past two decades is a public health concern because there is an increased risk to the mother and the fetus. Thus keeping in view the complications and the social aspect of multifetal gestation the present study on fetomaternal outcome associated with multifetal gestation was undertaken.

MATERIAL AND METHOD: The study of fetomaternal outcome associated with multifetal gestation was carried in the department of obstetrics and gynecology, Sree Mookambika Institute of Medical Sciences, Kanyakumari, Tamil Nadu from April 2008 to may 2011. All cases of multifetal gestation pregnancy either admitted from antenatal clinics or from labor room as emergency cases were included in the study. During this period there were 5020 deliveries, out of which there were 48 cases of multiple pregnancy of different gestational age.

Detailed history of the patient including age, parity, menstrual history, obstetric history, past, family, personal history were recorded. The clinical, systemic and obstetric examination, with required investigation was done. The routine obstetric ultrasound was done in booked cases. During labor the presentation, position, fetal heart rate was determined, pelvic examination and cervical condition were assessed. The time interval between delivery of twins were recorded. The mode of delivery of first, second and third baby, the associated complications, type of interference and complication of third stage were recorded.

The placenta of all cases was labeled, examined and zygosity was determined from studying the separating membranes. Babies born were examined for live birth, still birth (fresh or macerated), signs of trauma. The sex of the child was noted. Apgar score at 1 and 5 minutes and resuscitation measures if any were noted. The birth weight was noted. The first week illnesses of the babies born were noted. Any associated early neonatal death and the causes were determined. The maternal morbidity and mortality, with the cause was noted during the 7 days postpartum period and stay in the hospital. Paediatric consultation was obtained from time to time in the management of neonates. All information was recorded in a proforma and the fetomaternal outcome of multifetal gestation was analysed. The outcome of multiple and singleton pregnancies were reviewed.

RESULT: Out of 5020 consecutive deliveries, 48 cases of multiple pregnancies were observed. The outcome of 4972 singleton pregnancies and 48 multiple pregnancies were reviewed. There were 46 twins and 2 triplets. The incidence was 1 in 104.58 births. More than half of cases in both cases were unbooked. About 58.33% of mothers with multiple pregnancy were in the age group of 20-24 years. 43.75% of cases of multiple pregnancy were primigravida and 45.85% of singleton pregnancy were primigravida. Out of 48 multiple pregnancy, 2.08% of cases had family history of multiple pregnancy, 12.5% of cases had history of ovulation induction. 58.33% of multiple pregnancy delivered between 34-36 weeks, only 12.5% of cases delivered at term. While 72.92% of singleton pregnancies occurred at term. The chi square $X^2 = 104$ and $DF = 3$, $P < 0.001$ which is highly significant (Table 1). Table 2, depicts major complications associated with multiple vs. singleton pregnancy. [Preterm labor (87.5% vs. 4.06%), APH (4.17% vs. 0.8%), eclampsia (2.08% vs. 1.59%), hydramnios (33% vs. 1.0%), PIH (25% vs. 4.04%), hyperemesis gravidarum (6.25% vs. 2%)]. Anemia (16.6% vs. 10.13%) was a common complication in both singleton and multiple pregnancies. The first baby weighed more than higher order births in 54.17% cases. 64.59% cases of multiple pregnancy were like sex and 35.42% were unlike sex. The perinatal mortality in singleton pregnancy was found to be 22/1000 live births and the neonatal mortality was found to be 10/1000 live births. The common causes in singleton pregnancy were low birth weight 30% and prematurity 26%. The fetal mortality rate in multiple pregnancy was studied in different gestational age groups in Table 3. The mortality rate in multifetal gestation is inversely proportional to gestational age. It was high earlier than 33 weeks (88/1000 births) and gradually decreases towards term (23/1000 births). There is a progressive decrease in fetal death, neonatal death rate and perinatal mortality rate with increase in birth weight. However, when weight

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was >2500gm, the fetal death rate increased although the early neonatal and perinatal mortality was less (Table 4). In Table 5, the commonest presentation was vertex-vertex. 56% of higher order birth were delivered within 5 minute of delivery of the first baby. Table 6, depicts the relationship of mode of delivery and the perinatal mortality. The mortality was 122/1000 births in LSCS as against 193/1000 births in normal vaginal delivery. Assisted breech and spontaneous breech delivery was associated with mortality of 11/1000 births respectively. The mortality in presentation and mode of delivery was influenced by fetal factors like prematurity, birth weight, RDS and associated maternal complications. The male fetuses were 3 times more susceptible than the female fetuses. Apgar score at 1 and 5 minute was recorded. A low Apgar score was recorded in second and third order birth than first baby. RDS, birth asphyxia, trauma, infection, were the causes for neonatal morbidity and mortality. RDS was the leading cause of death due to prematurity. 20.38% of mothers with multiple births suffered morbidity due to PPH and infection as against 5% in singleton pregnancy.

$$\text{Perinatal mortality rate} = \frac{\text{no. of resident fetal death of 28wk or more gestation} + \text{no. of resident newborn dying under 7 days of age}}{\text{no. of resident live birth} + \text{resident fetal death of 28/more week gestation.}} \times 1000$$

$$\text{Early neonatal mortality} = \frac{\text{no. of death 0-6 days}}{\text{Total live birth}} \times 1000$$

$$\text{Fetal death rate} = \frac{\text{no. of resident fetal death}}{\text{no. of resident live birth} + \text{no. of resident fetal death}} \times 1000$$

DISCUSSION: The number and the rate of higher order multiple births have increased in the United States at an unprecedented pace over the past two decades. Between 1980 and 2001, the number of twin deliveries rose 77%, the number of higher order multiple birth soared 459%. 1 Multiple pregnancy accounts for 3% of all pregnancies and 10% of perinatal deaths. 1 In the present study out of 5020 deliveries, the outcome of 4972 singleton deliveries and 48 multiple gestation were studied. 46 delivery were twins and 2 were triplet. An incidence of 1 in 104.58 births was recorded. The incidence of dizygotic twinning is influenced remarkably by race, heredity, maternal age, parity and fertility drugs. ART may lead to the increased incidence of monozygotic twinning. The ovulation induction increases both dizygotic and monozygotic twinning. The perinatal morbidity and mortality is increased. The attributable factors are preterm delivery, malformations, twin to twin transfusion syndrome, 2 discordant growth, 3 low birth weight. 4 Preterm delivery is the major contributing factor for neonatal death and morbidity. 5 The neonatal period may be complicated by heart failure, hypervolemia, hyperviscosity, polycythemia, hyperbilirubinemia and kernicterus. In the present study the perinatal mortality rate was high in 31-33 weeks (88/1000 births) while it was 23/1000 births at term. Prematurity was the major cause of PNMR. Low birth weight was the second major cause of increased perinatal mortality, 1001-1500gm (202/1000 births) 1500-1800gm (60/1000 births) 1800gm-2000gm ((12/1000 births). Ironically the fetal death was increased when the weight more than 2500gm (23/1000). In order to

understand the perinatal problem in twins >2500 gm more clinical research is needed. Since twins are more likely to be growth retarded in utero, it has been suggested that the lower weight – specific death rate in twins are due to greater maturity in twins as compared to singleton of equivalent weight. Some of the causes of neonatal death could be are twin-twin transfusion syndrome, discordant growth, hypervolemia, hyperbilirubinemia polycythemia, neurological damage due to cerebral anomalies. The perinatal mortality in different mode of delivery, IPV and breech extraction (12/1000) spontaneous delivery (193/1000), LSCS (122/1000), assisted breech (11/1000), spontaneous breech (11/1000). The mortality in relation to presentation and mode of delivery was influenced by number of cases in each group, fetal and maternal complications. The perinatal mortality was 2.2 times more in second baby than first baby. There was mortality in the third baby as LSCS was performed in triplets. The maternal complications like preeclampsia, postpartum hemorrhage, preterm labor, membrane rupture, anemia, polyhydramnios, malpresentations, and maternal death are increased.⁶The incidence of pregnancy hypertension in women with twins was 20% in Parkland hospital. The incidence of PIH in twins was 15% vs 6% in singleton pregnancy and the incidence was 23% vs 6% in triplets compared to twins. In the present study, maternal complications were increased in multifetal gestation as compared to singleton pregnancy [anemia 16.6% vs 10.13%), preeclampsia (25%vs 4.04%), polyhydramnios (8.33%vs1.00%), preterm labor (87.5%vs4.06%), APH (4.17% vs0.80%), eclampsia (2.08%vs1.59%). As the number of fetuses increases the duration of gestation decreases.⁵7% of twins born in United States in 2001 were delivered preterm, and their mean gestational age of delivery was 35 weeks. With triplets, 92% were delivered preterm and their mean gestational age at delivery was 32 weeks. All quadruplets and quintuplets delivered at 30 and 29 weeks respectively.¹ ACOG (1998b) concluded, 'Caesarean delivery is the method of choice when first twin is non cephalic. While the optimal delivery route for cephalic-noncephalic twin is controversial as weight of fetus < or =1500gm is taken as a contributing factor.⁶ The interval between delivery of twins is not critical in determining the outcome of twins delivered second. However, vigilance is required'. While some studies demonstrate a significant correlation between worsening umbilical cord blood gas values and increasing time interval between delivery of first and second twins.⁷While many clinicians believe that pregnancy complicated by three or more fetuses are best delivered by caesarean section. Some studies show neonatal outcome were the same in vaginal and caesarean groups.⁸

Thus multiple pregnancy is a high risk pregnancy which needs further clinical studies to know the impact of zygosity and placentation on the fetomaternal outcome.

CONCLUSION: Although ART is a boon to infertile couples, but there is an unprecedented increase in the higher order births have increased. Multiple gestation is a high risk pregnancy associated with increased maternal and fetal complications. Thus it requires an optimum obstetric care, resuscitation facilities and intensive neonatal care to improve maternal and neonatal outcome.

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Table.1 Distribution of cases according to gestational age at delivery.

Period of Gestation in Weeks	Multiple pregnancy		Singleton Pregnancy	
	No of Cases	%	No. of Cases	%
28 - 30	2	4.17	103	2.08
31 - 33	12	25%	207	4.17
34 - 36	28	58.3	1036	20.83
37 and above	6	12.5	3626	72.92
Total	48	100.00	4972	100.00

X²=104

DF=3

P<0.001

Table.2 Associated pregnancy complications.

Complications	Multifetal Pregnancy		Singleton Pregnancy	
	No. of Cases	%	No. of Cases	%
Hyperemesis	03	6.25%	100	2%
Anaemia	08	16.66%	504	10.13%
PIH	12	25%	201	4.04%
Hydramnios	04	8.33%	50	1.00%
Eclampsia	01	2.08%	79	1.59%
APH	02	4.17%	40	0.80%
Preterm Labor	42	87.5%	201	4.06%

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Table. 3 Perinatal mortality in relation to gestational age in multifetal gestation.

Gestational Period	No. of Total Birth	No. of live births	Fetal Death		Early NND		Perinatal Mortality	
			No.	Rate	No.	Rate	No.	Rate
28 - 30	4	2	2	23	2	24	4	47
31 - 33	24	16	8	88	8	97	16	177
34 - 36	57	53	4	46	6	73	10	116
37 & above	3	11	2	23	0	-	2	23
Total	98	82	16		16		32	

Table.4 Perinatal mortality in relation to birth weight in multifetal gestation.

Birth weight in gm.	No. of Total Birth	No. of Live birth	Fetal Death		Early NND		Total Death	
			No.	Rate	No.	Rate	No.	Rate
1001-1500	25	13	12	127	7	85	19	202
1501-1800	19	18	1	12	4	48	5	60
1801-2000	21	20	1	12	4	48	5	60
2000-2500	30	30	0	-	1	12	1	12
>2500	3	1	2	23	-	-	2	23
Total	98	82	16		16		32	

Table.5 Fetal mortality in relation to presentation in multifetal gestation.

Presentation	Total Deliveries		Total Death	
	No.	%	No.	Rate
Vertex - Vertex	32	66.6	10	238
Vertex - Breech	2	4.16	1	30
Breech - Vx	3	6.25	-	-
Breech - Breech	7	14.58	3	85
Vx - Transverse	-	-	-	-
Br - Transverse	-	-	-	-
Transverse - Vx	1	2.08	-	-
Tr - Br	3	6.25	2	58
Total	48		16	

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Table.6 Perinatal mortality in relation to mode of delivery.

Mode of Delivery	Baby 1		Baby 2		Baby 3		Total Cases	PNMR	
	No. of Cases	%	No. of Cases	%	No of Cases	%	No. of Cases	No. of death	Rate
Spontaneous Vx	27	56.25	24	50			51	18	193
Instrumental Delivery	2	4.17	2	4.17			4	-	-
Spontaneous Br	1	2.08	1	2.08			2	1	11
Assisted Br	-	-	2	4.17			2	1	11
CS	18	37.5	18	37.5	2	-	38	11	122
IPV & Breech Extraction	-	-	1	2.08			1	1	12
Total	48		48		2		98	32	