STUDY OF MATERNAL AND PERINATAL OUTCOME IN MULTIFOETAL PREGNANCY

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ABSTRACT

BACKGROUND

Multifetal gestation is responsible for a disproportionate amount of overall perinatal mortality and morbidity. Multifetal pregnancies have increased due to fertility treatment for assisted reproductive techniques.[1]

Aims and Objectives-

- To study the maternal and foetal complications in multifetal pregnancy.
- To observe the different modes of delivery in multifetal pregnancy.
- To study neonatal outcome in multifetal pregnancy.

MATERIALS AND METHODS

A prospective observational study was carried out at tertiary care centre for one year from June 2016 to June 2017. 30 cases of multifetal pregnancy at or beyond 28 weeks of gestation were enrolled in this study.

RESULTS

In this study, maximum number of patients having multifetal pregnancy are in 26 -30 year age group. Among these patients 50% were conceived through assisted reproductive techniques and 50% were conceived spontaneously. Maximum (70%) patients are nulliparous. Among these patients, 83% were having DADC twins. Preterm labour is most common complication in this study. 70% patients were delivered by caesarean section and most common indication being precious pregnancy. In this study, there was 1 neonatal death among the twins.

CONCLUSION

Multifetal gestations have higher maternal and neonatal complications. Preterm delivery and surgical interventions are major complications and has an impact on perinatal outcome.

KEYWORDS

Multifetal Pregnancy, Artificial Reproductive Techniques, Perinatal Outcome, Maternal Outcome.

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BACKGROUND

Multifetal gestations comprise of less than 1% of all births, yet they are responsible for a disproportionate amount of overall perinatal mortality and morbidity. Incidence of multifetal pregnancies has increased because of ovarian stimulation and fertility treatment for assisted reproductive techniques.[2,3]

The presence of more than one foetus in the gravid uterus is called multiple pregnancy.

- Two foetuses (twins)
- Three foetuses (triplets)
- Four foetuses (quadruplets)
- Five foetuses (quintuplets).
- Six foetuses (sextuplets).

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Incidence- Hellin's Law: according to the law, incidence of twins is 1:89, Triplets: 1:89.[4], Quadruplets: 1:89.[5], Quintuplets: 1:89.[1] Incidence of conjoined twins is 1 in 60,000. Worldwide incidence of monozygotic is 1 in 250. Incidence of dizygotic twins varies & increasing.[6]

Demography- Incidence of twins is most common in Negroes. It Increases with the increasing maternal age. It is more common in multipara. Chances of twin pregnancy are more common with patients having family history of multifetal gestation. More common with well-nourished women. Ovulation induction with clomiphene citrate, gonadotrophins and IVF and conception after stopping OCP increases the chances of twin pregnancy.[4,1]

TWINS.

Varieties- Dizygotic twins are commonest with 2/3 of incidence**.** 1/3 of the cases are monozygotic twins. Fertilization of two ova by two sperms is called dizygotic twins.

The degree of separation of the twins in utero depends on if and when they split into two zygotes. Dizygotic twins were always two zygotes. Monozygotic twins split into two

zygotes at some time very early in the pregnancy. The timing of this separation determines the chorionicity (the number of placentae) and amniocity (the number of sacs) of the pregnancy. Dichorionic twins either never divided (i.e.: were dizygotic) or they divided within the first 4 days. Monoamnionic twins divide after the first week.[3]

In very rare cases, twins become conjoined twins. Non-conjoined monozygotic twins form up to day 14 of embryonic development, but when twinning occurs after 14 days, the twins will likely be conjoined.

Conjoined Twins

- **Thoraco-omphalopagus**- Two bodies fused from the upper chest to the lower chest. These twins usually share a heart and may also share the liver or part of the digestive system.
- **Thoracopagus**- Two bodies fused from the upper thorax to lower belly. The heart is always involved in these cases. Separation of a genuinely shared heart has not offered survival to two twins; a designated twin may survive if allotted the heart, sacrificing the other twin.
- **Omphalopagus**- Two bodies fused at the lower abdomen. Unlike thoracopagus, the heart is never involved in these cases; however, the twins often share a liver, digestive system, diaphragm and other organs.
- **Parasitic twins**- Twins that are asymmetrically conjoined, resulting in one twin that is small, less formed, and dependent on the larger twin for survival.
- **Craniopagus**- Fused skulls, but separate bodies. These twins can be conjoined at the back of the head, the front of the head, or the side of the head, but not on the face or the base of the skull.

Superfecundation- Fertilization of two different ova released in the same cycle.
Superfetation- Fertilization of two ova released in different cycles.

Differences in Zygosity

Monozygotic- It is a type in which one ovum is fertilized by one sperm. Mostly they have same sex, carry identical features, having single or double placenta. They share same genetic features and DNA microprobe.
Dizygotic- It is a type in which there is fertilization of two ova by two sperms. They have same or opposite sex, fraternal resemblance, having single or double placenta. They share different genetic features and DNA microprobe.

Differences in Chorionicity with Single Placenta

Diamniotic Dichorionic (Fused Placenta)- They are monozygotic or dizygotic having thick dividing membrane of >2mm size with Twin peak/Lambda sign.

Monochorionic Diamniotic- They are monozygotic having thin diving membrane of 2mm or less size with 'T' sign.[7]

Diagnosis History- History of ovulation inducing drugs specially gonadotropins and family history of twinning (maternal side).

Symptoms- Hyperemesis gravidarum, palpitation or shortness of breath, Tendency of swelling of the legs, Varicose veins, Haemorrhoids, Excessive abdominal enlargement, Excessive foetal movements.

General Examination- Prevalence of anaemia is more than in singleton pregnancy, Unusual weight gain, not explained by pre-eclampsia or obesity.

Abdominal Examination

Inspection- The elongated shape of a normal pregnant uterus is changed to a more "barrel shape" and the abdomen is unduly enlarged.
Palpation- Fundal height is more than the period of amenorrhoea. Girth is more than normal. There is Palpation of too many foetal parts, two foetal heads and three foetal poles.
Auscultation- There is presence of Two distinct foetal heart sounds with Zone of silence with 10 beats difference.
D/D of Increased Fundal Height- full bladder, wrong dates, hydramnios, macrosomia, fibroid with pregnancy, ovarian tumor with pregnancy, adnexal mass with pregnancy, ascites with pregnancy, molar pregnancy.

Investigations

- **Sonography-** In multi foetal pregnancy it is done to obtain the following information-

i. Suspecting twins – 2 sacs with foetal poles and cardiac activity
ii. Confirmation of diagnosis
iii. Viability of foetuses, vanishing twin
iv. Chorionicity – 6 to 9 weeks (single or double placenta, twin peak sign in diamniotic dichorionic gestation or T sign in monochorionic diamniotic)
v. Pregnancy dating,
vi. Foetal anomalies
vii. Foetal growth monitoring (at every 3-4 weeks interval) for IUGR
viii. Presentation and lie of the foetuses
ix. Twin transfusion (Doppler studies)
x. Placental localization
xi. Amniotic fluid volume.

- **Radiography**

When pregnancy is more than 18 weeks then higher order multiple gestation is better diagnosed with the help of x-ray. Disadvantage is- not useful before 18 weeks, as foetal skeletons are not visible. Obesity and hydramnios interfere with diagnosis. Theoretical possibility of radiation hazards and x-ray is not recommended now.

- **Biochemical tests**

Raised but not diagnostic. These tests include Maternal serum chorionic gonadotropin, Alpha fetoprotein, Unconjugated oestriol.

Twin Peak Sign-is a sonographic finding in early weeks where dichorionic twin is differentiated from the monochorionic twin. This sign is triangular projection of placental tissue between the layers of dividing membrane over the chronic surface. Here, the intervening membrane become thick and consist of four layers. It is diagnostic of dichorionic gestation. It is also known as Lambda sign. It disappears after 20 weeks.

T-sign- the right angled relationship between the membranes and placenta with no apparent extension of placental tissue between the dividing membrane as found in monochorionic pregnancy is called T-sign. The thickness of dividing membrane is less than 2mm and consist of 2 layers.[8]

Lie and Presentation

Longitudinal lie (90%): It includes different presentations like both vertex (40%), Vertex + breech (28%), breech + vertex (9%), both breech (6%).

Others includes vertex + transverse, breech + transverse, both transverse.

Complications of Multifetal Gestation-

- **Maternal**
  Pregnancy
  Labour
  Puerperium
- **Foetal**
- **Maternal- During Pregnancy-**
  Miscarriages
  Hyperemesis gravidarum
  Anaemia
  Pre-eclampsia (25%)
  Hydramnios (10%)
  Gestational diabetes mellitus (2 – 3 times)
  Antepartum haemorrhage – placenta previa and placental abruption
  Cholestasis of pregnancy
  Malpresentations
  Preterm labour (50%) twins – 37 weeks, triplets – 34 weeks, quadruplets – 30 weeks
  Mechanical distress such as palpitation, dyspnoea, varicosities and haemorrhoids
  Obstructive uropathy.

During Labour-

- Pre-labour rupture of the membranes
- Cord prolapse
- Incoordinate uterine contractions
- Increased operative interference
- Placental abruption after delivery of 1st baby
- Postpartum haemorrhage

During Puerperium

Subinvolution
Infection
Lactation failure.

During Labour

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During Puerperium

Subinvolution
Infection
Lactation failure.

Foetal– more with Monochorionic

- **Spontaneous abortion -**more common in monozygotic twins.
- **Single Foetal Demise**

Vanishing twin– before 10 weeks Foetus papyraceous/ compressus – 2nd twin Complications in 2nd twin (depend on chorionicity)

Neurological, renal lesions
Anaemia, Disseminated intravascular coagulation
Hypotension and death.

Foetal – more with Monochorionic

- **Low Birth Weight (90%)**

Prematurity– spontaneous or iatrogenic Foetal Growth Restriction- in 3rd trimester, asymmetrical, in both foetus.

- **Discordant Growth**- Difference of >25% in weight, >5% in HC, >20 mm in AC, abnormal Doppler waveforms.

Causes– unequal placental mass, lower segment implantation, genetic difference, TTTS, congenital anomaly in one twin.

Congenital Anomalies – conjoined twins, neural tube defects – anencephaly, hydrocephaly, microcephaly, cardiac anomalies, Downs syndrome, talipes, dislocation of hip.

TTTS -Twin to Twin Transfusion Syndrome

- cause – AV communication in placenta – blood from one twin goes to other – donor to recipient
- donor – IUGR, oligohydramnios
- recipient – overload, hydramnios, Congestive heart failure, Intrauterine death.

TRAP -Twin reversed arterial perfusion syndrome or Acardiac Twin- absent heart in one foetus with arterio-arterial communication in placenta, donor twin also dies

Cord Entanglement and Compression– more in monoamniotic twins.

Locked Twins

Asphyxia – cord complication, abruption

Still Birth – antepartum or intrapartum cause

Monoamniotic Twins

High perinatal morbidity, mortality.
Causes- cord entanglement
Congenital anomaly preterm birth
Twin to twin transfusion syndrome.[9]

Antenatal Management- It includes additional 300 cal per day, increased proteins, 60 to 100 mg of iron and 1 mg of folic acid extra. It also includes increased rest, frequent and regular antenatal visits, foetal surveillance by ultrasonography every 4 weeks and corticosteroids only in threatened preterm labour.

Management During Labour- Place of delivery is preferably tertiary level hospital.

First Stage- Blood is to be cross matched and prepare ready. Patient is confined to bed, oral fluids allowed or to be kept nil by oral. Strict intrapartum foetal monitoring is done.

Second Stage– Delivery of first baby is done as in singleton pregnancy. IV line started. No oxytocic is to be given after delivery of first baby. Cord clamping at 2 places is secured before cutting. Labelling of 1st baby is ensured.

- Delivery of second twin: FHS of second baby is monitored. Lie and presentation of second twin is assessed. Waited for uterine contractions and delivery is conducted.
- Delivery of second twin – problems & interventions.

If there are inadequate contractions, augmentation is done by artificial rupture of membrane or oxytocin. If lie is transverse than external cephalic or internal podalic version is done. If there is foetal distress, abruption or cord prolapse than delivery is expedited by forceps, ventouse, breech extraction.

Third Stage – Active Management of Third Stage of Labour

Continue oxytocin drip 20 unit 20 to 40 drops per min. inj. Carboprost 250 µgm IM given. Vitals monitoring done for 2 hours.

Indications of Caesarean- These are Non-cephalic presentation of first twin, Monoamniotic twins, Conjoined twins, Locked twins, Other obstetric conditions, Second twin – incorrectable lie, closure of cervix.[8,10]

Aims and Objectives

- To study maternal and foetal complications in multifetal pregnancy.
- To observe different modes of delivery in multifetal pregnancy
- To study the neonatal outcome in multifetal pregnancy.

MATERIALS AND METHODS

Prospective Observational study was carried out at tertiary care center for one year from June 2016 to June 2017. 30 cases of multifetal pregnancy at or beyond 28 weeks of gestation were enrolled in study. A written, informed consent was taken from all the patients. Outcome was recorded as number of patients who delivered spontaneously vaginally, requiring instrumentation and those who required caesarean section. Foetal outcome in view of gestation age at birth, weight at birth, baby resuscitation, requirement of NICU admission were analysed.

Inclusion Criteria

- Multifetal pregnant female
- Beyond 28 weeks of gestation.

Exclusion Criteria

- Anaemic patients
- Patients with pregnancy induced hypertension
- Patients with other medical disorders.

OBSERVATION AND RESULTS

Age Group (Year)	Number of Patients
21-25	08 (26.6%)
26-30	17 (56.6%)
31-35	05 (16.6%)
Total	**30 (100%)**

Table 1. Distribution According to Age Group of Patients (n-30)

In this study, maximum number of patients having multifetal pregnancy are in 26-30year age group.

Conceived through Assisted Reproductive Techniques	Conceived Spontaneously
15 (50%)	15 (50%)

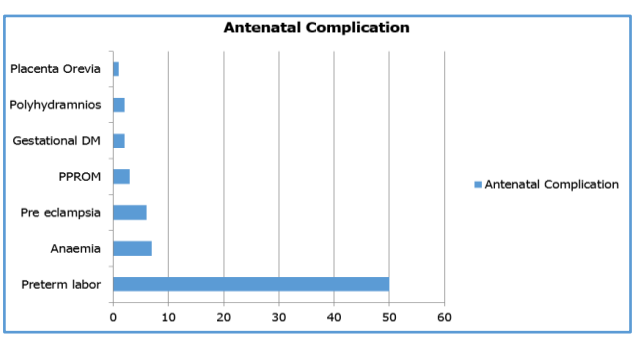
Table 2. Distribution According to Type of Conception (N-30)

Parity	Number of Patients
Nulliparous	21 (70%)
Second para	07 (23.3%)
Third para	02 (6.6%)
	30 (100%)

Table 3. Distribution According to Parity of Patients (n-30)

Dichorionic Diamniotic	Monochorionic Diamniotic
25 (83.3%)	5 (16.6%)

Table 4. Distribution According to Chorionicity and Amniocity (n-30)



Graph 1. Distribution According to Antenatal Complication

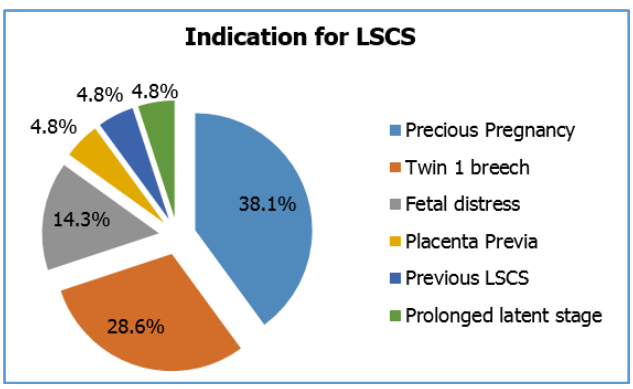
No.	Antenatal Complication	Number of Patients
1.	Preterm labour	15(50%)
2.	Anaemia	7(23.3%)
3.	Pre-eclampsia	6(20%)
4.	PPROM	3(10%)
5.	Gestational Diabetes Mellitus	2(6.7%)
6.	Polyhydramnios	2(6.7%)
7.	Placenta previa	1(3.3%)

Table 5. Distribution According to Antenatal Complication

Normal Vaginal Delivery	Caesarean Section
9 (30%)	21 (70%)

Table 6. Distribution According to Mode of delivery (n-30)

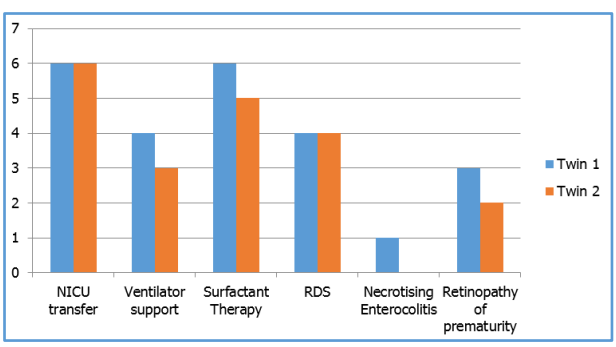
Most common indication of LSCS was precious pregnancy which included patients with bad obstetric history, recurrent pregnancy losses and those who conceived through assisted reproductive techniques.



Graph 2. Indication for LSCS

No.	Complication	No. of Patients
1.	Postpartum Haemorrhage	6(20%)
2.	Eclampsia	2(6.7%)
3.	Obstetric Hysterectomy	1(3.3%)

Table 7. Distribution According to Postpartum Complication



Graph 3. Distribution According to Perinatal Outcome of both Babies

There was 1 neonatal death among the twins.

DISCUSSION

Maximum number of patients (56.6%) are between 26-30 year age group. 50% patients conceived by Assisted Reproductive Techniques. Maximum number of patients (70%) are Nulliparous. 83.3% patients having Dichorionic Diamniotic. Most common antenatal complication is preterm labour (50%). 70% patients delivered by caesarean section. Most common indication of LSCS was precious pregnancy. 20% patients having postpartum haemorrhage as complication. In this study, NICU transfer rate was 23.3% for twin 1 and twin 2. Ventilator requirement was 13.3% and 10% in twin 1 and twin 2 respectively.

Another study on multifetal gestation was done in July-August 2002 on perinatal outcome of 112 pregnancies, according to which triplets, quadruplets and quintuplets were delivered at a mean gestational age of 31+5, 29+5 and 28+4 weeks, respectively. In that study, perinatal mortality was 14 for triplets and 36 for quadruplets. Respiratory distress syndrome occurred in 23% of triplets, 65% of quadruplets and 75% of quintuplets. Intracranial haemorrhage was diagnosed in 14% of triplets, 15% of quadruplets and 10% of quintuplets and retinopathy of prematurity was found in 10% of triplets, 9% of quadruplets and 25% of quintuplets.[10]

Another same study was done July- August 2016 in Maharashtra, according to which incidence of twins was much higher than reported in other studies. It could be because of the referral of twin pregnancies to that hospital from other hospitals around for (NICU) neonatal care of low birth weight in premature babies. In that study, 85% of twin gestation were in age group of 26-35 years as compared to study done by Spellacy et al shows 55% of twins in same age group. In that study, family history of twinning were 7%. 59% were conceived spontaneously. Patients who conceived by IVF treatment were 30%. 70% patients were primigravidae and 30% were multigravidae.[4]

CONCLUSION

Multiple pregnancies are high risk pregnancies. Increase in their incidence is due to an increase in the use of ovarian stimulation during Assisted Reproductive Techniques. Multifetal gestations have higher maternal and perinatal complications. Preterm delivery and surgical intervention (LSCS) are major complications and has an impact on perinatal outcome. The successful perinatal outcome depends upon team effort of an obstetrician and neonatologist.

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