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AICOG Obstetrics & Gynecology Update 2016



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Foreword
Prof. Alka Kriplani

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Contents

Section 1: Obstetrics

1. **Nausea and Vomiting in Pregnancy** 3
   Anupam Gupta

2. **Recent Trends in Diagnosis and Management of Recurrent Pregnancy Loss** 10
   Girija Wagh

3. **Management of Multifetal Pregnancy** 20
   Neha Priyadarshin

4. **Scope and Limitations of Nonsurgical Approach to Ectopic Pregnancy** 24
   Shailesh Kore, Chaitra Thunga

5. **Role of Immunology in Obstetric Practice** 30
   Parikshit D Tank

6. **Are TORCH Tests Relevant in Modern Obstetric Practice?** 37
   Madhuri Chandra

7. **Management of Viral Infections in Pregnancy** 44
   Anita Singh, Richa Jha, Shipra Singh

8. **Human Immunodeficiency Virus in Pregnancy: What is New?** 54
   Sarita Agrawal, Shreya Goenka, Subarna Mitra

9. **Diagnosis and Management of Liver Diseases in Pregnancy** 66
   Saloni Suchak, Uday Thanawala

10. **What is New in Imaging Science Practice in Obstetrics and Gynecology?** 74
    Sonal Panchal, Narendra Malhotra, Jaideep Malhotra

11. **Eradication of Anemia during Pregnancy** 90
    Saswati Sanyal Choudhury

12. **Management of Thalassemia Major in Pregnancy** 100
    Shyamal Seth

13. **Scope and Limitations of Ultrasonography in Diagnosis of Placenta Previa** 107
    Abha Rani Sinha, Anupma Singh, Sneh Kiran

14. **Diagnosis and Treatment of Preterm Labor** 115
    Geetha Balsarkar

15. **Improving Pregnancy Outcome in Pregnancy-induced Hypertension** 124
    Mohita Agarwal

16. **Can Eclampsia be Eradicated by Good Practice Guidelines?** 131
T Ramani Devi, Sripriya Pragasam

17. **Prevention and Management of Postpartum Hemorrhage** 148
Sheela V Mane, Priyanka

18. **Cesarean Section on Maternal Request: An Obstetrician's View** 161
Alka Pandey

19. **Does Electronic Fetal Heart Monitoring Improve Fetal Salvage?** 168
Ameya C Purandare, Kirti Bendre

20. **Role of Trial of Labor in Modern Obstetrics** 176
Reena Wani, Ankesh R Sahetya

21. **Is Routine Partogram Essential for Monitoring Labor Progress?** 181
Ajay Mane, Rajendra Singh Pardeshi

22. **Diagnosis and Management of Antepartum and Intrapartum Fetal Asphyxia** 189
Richa Saxena, Tania Banerjee, Neharika Malhotra

23. **Management of Severe Fetal Anomalies Detected after 20 Weeks** 201
Sujata Misra, Om Avishek Das

24. **Is C-section for Breech Presentation Justified?** 207
Pushpa Sethi, Ragini Agrawal

25. **Destructive Obstetric Procedures** 215
Durga Shankar Dash

26. **Millennium Development Goals for Reducing Maternal Mortality: An Overview** 222
Dilip Kumar Dutta, Indranil Dutta

27. **Multidisciplinary Approach for Prenatal Screening and Diagnosis** 227
Apoorva Pallam Reddy, Narendra Malhotra, Jaideep Malhotra

Section 2: Gynecology

28. **Recent Advances in Pelvic Floor Anatomy** 233
Fessy Louis T, Aswath Kumar, Aysha Salam

29. **Recent Advances in Polycystic Ovarian Syndrome** 241
Alka Kriplani, Garima Kachhawa

30. **Adolescent Gynecological Problems** 246
Jayam Kannan, Prashitha P

31. **Recent Advances in Male Infertility** 249
Diksha Goswami, Jaideep Malhotra

32. Recent Innovations in Management of Pelvic Organ Prolapse **254**
Mangesh Narwadkar, Pankaj Sarode

33. Recent Innovations in Treatment of Stress Urinary Incontinence **261**
Prakash Trivedi, Alpesh Gandhi, Nishita Parekh

34. Newer Trends in Diagnosis and Management of Endometriosis **274**
Kanthi Bansal

35. Role of Molecular Genetics in Gynecologic Cancer **280**
Richa Saxena, Sonal Jain, Narendra Malhotra

36. Scope and Limitations of Nonsurgical Approach to Mild Dysfunctional Uterine Bleeding **288**
Shally Gupta, Jaideep Malhotra

37. Fetus as a Patient **292**
Raju R Sahetya, Ankesh R Sahetya

38. Third-party Reproduction **305**
Nandita Palshetkar, Hrishikesh D Pai, Pinky Ronak Shah

39. Medicolegal Aspects of Surrogacy **314**
Nayana Patel, Nilofar Sodagar

40. Will Development of Endoscopic Approach Banish Open Surgery for Gynecological Problems? **318**
Rishma Dhillon Pai, Hrishikesh D Pai, Pinky Ronak Shah

41. Why is Infertility Increasing? **326**
Sonia Malik, Gunjan Sabherwal

42. Alternatives to Surgical Contraception **332**
Richa Saxena, Manika, Jaideep Malhotra

43. In Vitro Fertilization in Developing Economies—Reducing Cost, Not Quality **339**
Gautam N Allahbadia, Goral N Gandhi, Akanksha G Allahbadia

44. Future of Oral Contraceptive Pill **345**
Basab Mukherjee

45. Would the New Vaccines Eradicate Cervical Cancer? **350**
Jayshree Pathak, Neharika Malhotra, Neerja Bhatla

46. Ovarian Cancer—Early Diagnosis **356**
Suvarna Khadilkar, Suman Singh

47. Gynecological Endoscopy **365**
Bijoy Kumar Nayak

48. What should Obstetrician/Gynecologist Know about Breast Cancer? **372**
Tarini Taneja

49. Three-dimensional Ultrasound and Reproductive Medicine **383**
Archana Baser, Zaidi Alia Kamber

50. Menopause: Is It a Disease or a Natural Process? **389**
Madhuri Patel, Surekha Tayade

51. Risks and Benefits of Hormone Replacement Therapy **396**
Suchitra N Pandit, Deepali Kale, Swati Bhargava

52. Premenstrual Syndrome: A Myth **403**
Bipin M Pandit, Pooja Bandekar

53. Infertility and Assisted Reproductive Technology **409**
Sonia Malik, Gunjan Sabherwal, Jaideep Malhotra

54. Medical Laws **442**
Hitesh Bhatt

55. Nutrition and Exercise for Women's Health **447**
Maninder Ahuja

56. How to Break Bad/Unfavorable News in Obstetric and Gynecologic Practice? **476**
Rohit Bhatt, Sonia Golani, Chandrahas Trivedi

57. Egg Banking **479**
Hrishikesh D Pai, Nandita Palshetkar, Rishma Dhillon Pai, Pinky Ronak Shah, Pritimala Gangurde, Deepa Talreja

58. Uterine Debulking during Nondescent Vaginal Hysterectomy **485**
Saroj Singh, Neha Agarwal

59. Postpartum Intrauterine Contraceptive Devices **493**
Saroj Singh, Ruchika Garg

Appendices

1. Normal Blood Values **501**
Richa Saxena

2. Normal Growth Charts **508**
Richa Saxena

Index **519**

3 CHAPTER

Management of Multifetal Pregnancy

Neha Priyadarshin

ABSTRACT

Multifetal pregnancy is the development of two or more fetuses simultaneously in a uterus, and the development of two fetuses simultaneously is known as twins. The incidence of monozygotic twins is uniform throughout the world as 3.5 per 1000 live births, whereas the incidence of dizygotic twins varies between 4 and 50 per 1000 live births. Minor trauma to the blastocyst during assisted reproductive technology (ART) may lead to increased incidence of twinning in in vitro fertilization (IVF) technology. Multifetal pregnancy is associated with an increment of all complications of pregnancy with the exception of fetal macrosomia and post-term pregnancy. Maternal, placental and fetal complications are presented along with the management, postnatal care, twin-to-twin transfusion syndrome (TTTS), and acardiac twin or trap syndrome, in this chapter.

INTRODUCTION

Simultaneous development of two or more fetuses in the uterus is termed as multifetal pregnancy. The development of two fetuses simultaneously is known as twins; three fetuses as triplets; four fetuses as quadruplets; five fetuses as quintuplets and so on.

INCIDENCE AND EPIDEMIOLOGY

The incidence of monozygotic twins is uniform throughout the world as 3.5 per 1,000 live births; whereas, the incidence of dizygotic twins varies between 4 and 50 per 1,000 live births as it is affected by multiple factors such as use of assisted reproductive technology (ART), ethnic differences and maternal age.[1]

CLASSIFICATION

Zygosity

Zygosity is the degree of identity in the genome of twins.

Types

1. *Monozygotic, uniovular, identical or single egg twins*: They comprise one-third of total cases of twins. They are formed due to division of a fertilized ovum into two. As a result, the two fetuses are of the same sex, they share the same placenta, same genetic features and same blood group. The intervening membrane is composed of three layers, a fused chorion in the middle surrounded by amnion on two sides. Abnormal fetal growth and congenital malformations are more common amongst monozygotic twins.
2. *Dizygotic, fraternal, biovular and nonidentical or two egg twins*: They comprise two-thirds of all cases of twins. They are formed due to fertilization of two or more ova by sperms. As a result, the two fetuses can have different sexes; separate placenta, different genetic features and can have different blood groups as well. The intervening membrane is composed of four layers, two chorions in the middle surrounded by two amnion on two sides. Abnormal fetal growth and congenital malformations are less common amongst the dizygotic twins.

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GENESIS OF MONOZYGOTIC TWINS

The development mechanism of monozygotic twinning is poorly understood. Minor trauma to the blastocyst during ART may lead to increased incidence of twinning in in vitro fertilization (IVF) pregnancies (Wenstrom and coworkers, 1993).

The outcome of monozygotic twinning depends on the time of division. If division occurs within 72 hours of fertilization, a diamniotic, dichorionic twinning occurs. If division occurs within 4th and 8th day, a diamniotic, monochorionic twinning occurs. If decision occurs after 8 days, monoamniotic, monochorionic pregnancy occurs. Conjoined twins or Siamese twins occur when embryo splits at or after 13 days of gestation. They share a particular body part with each-other: thoracopagus (joined at the chest); omphalopagus (joined at the anterior abdominal wall); craniopagus (joined at the head); and ischiopagus (joined at the ischium).

DIAGNOSIS OF CHORIONICITY AND AMNIONICITY

Ultrasound Examination

- The identification of fetuses with opposite sex confirms the diagnosis of dichorionic-diamniotic (Di-Di) pregnancy
- When two placentas are identified by ultrasound examination the pregnancy is Di-Di
- Visualization of "lambda sign" or "peak sign" on ultrasound that corresponds to a triangular projection of chorionic tissue reveals Di-Di pregnancy.

Ultrasonography (USG) examination can determine chorionicity and amnionicity during the first and second trimester of pregnancy with an accuracy of 95% (Stenhouse et al., 2002).

COMPLICATIONS

Multifetal pregnancy is associated with an increment of all complications of pregnancy with the exception of fetal macrosomia and post-term pregnancy.

Maternal Complications

- Spontaneous abortion
- Anemia
- Hyperemesis gravidarum
- Gestational diabetes
- Preterm birth
- Gestational hypertension
- Pre-eclampsia.

Placental Complications

- Placenta previa
- Abruptio placenta
- Premature rupture of membranes
- Umbilical cord entanglement
- Umbilical cord prolapsed
- Postpartum bleeding.

Fetal Complications

- Fetal growth discordance
- Fetal growth restriction
- Fetal demise of one or two twins
- Congenital abnormalities
- Fetal malpresentations
- Twin-twin transfusion syndrome
- Acardiac twins.

MANAGEMENT

Goals

- Early diagnosis
- Prevention of preterm birth
- Evaluation of fetal growth
- Assessment of fetal well being
- Determination of best mode of delivery.

Antepartum Management

- *Diet:* Increased dietary supplementation to the extent of 300 kcal over and above that needed in singleton pregnancy
- *Supplementation therapy:* (1) Iron intake is to be increased to the extent of 100–200 mg per day; (2) Vitamins, calcium and folic acid (5 mg) are to be given, over and above those prescribed for a singleton pregnancy
- Increased frequency of antenatal visits for early detection of anemia, pre-eclampsia or preterm labor
- Increased fetal surveillance and fetal growth assessment by serial ultrasound examination, amniotic fluid index (AFI) measurement, nonstress test (NST) and Doppler velocimetry
- *Prevention of preterm delivery:* Preterm labor is common in multifetal pregnancies and may complicate up to 50% of twins, 75% of triplets and 90% of quadruplet pregnancies (Elliott, 2007). The different modes applied to prolong multifetal gestation are:
  - *Bed rest:* Limited physical activity, early work leave, more frequent health care visits and USG examinations, and structured maternal education on

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preterm delivery risks have been advocated to reduce preterm births in women with multiple fetuses; but, unfortunately, there is little evidence that these measures substantially change the outcome[2]

- *Tocolytic therapy:* As for singleton pregnancies, there is no valid evidence that tocolytic therapy improves neonatal outcomes in multifetal gestation (Gyetvai and coworkers, 1999). Gabriel and colleagues (1994) concluded that women with multifetal gestation had significantly more cardiovascular complications when treated with β-mimetic for preterm labor. This is because of twin-induced maternal increased blood volume and cardiovascular demands increases susceptibility to hydration-associated pulmonary edema[2]
- *Corticosteroids for lung maturation:* A course of prenatal corticosteroids should be given to improve fetal outcome in women with multiple pregnancy who are considered at risk for preterm birth at less than 34 weeks, if birth is planned or there is high risk of birth within the next 48 hours[3]
- Progesterone therapy and cervical cerclage have not shown to improve perinatal outcome in women with multifetal pregnancies.

Intrapartum Management

Presentations of the twin fetuses on admission for delivery:

- Cephalic–Cephalic—42%
- Cephalic–Breech—27%
- Cephalic–Transverse—18%
- Breech–Breech—5%
- Others—8%.

Place of Delivery

Birth in a hospital is accepted practice,[4] with many advising birth in a tertiary unit.

Timing of Delivery

Induction of labor may be indicated for complications such as pre-eclampsia. The benefits of elective birth at 37 weeks of gestation to reduce the incidence of antepartum stillbirth as a result of intrauterine growth restriction are controversial. Retrospective data suggest that the lowest rate of perinatal mortality and morbidity in twin pregnancies occurs at 36–38 weeks of gestation, with the risk of adverse outcome increasing as gestation advances.[5-10]

Monitoring during Labor

Labor should be monitored using a partogram and the heart rate of both the fetuses must be monitored preferably using a cardiotocogram.

Mode of Delivery

It is affected by the presentation of the twins, which can be divided into three groups:

1. *First twin vertex, second twin vertex:* The most common presentation of twins is vertex-vertex. Vaginal delivery is recommended in these cases by most literature.[11-16]
2. *First twin vertex, second twin nonvertex:* In such cases, the opinion is divided on the optimal mode of delivery. Some recommend elective cesarean delivery, reporting reduced neonatal mortality and morbidity rates for the second twin.[13,17] Others suggest that there is no increase in neonatal risk associated with vaginal birth of the second twin weighing 1,500 g or more, either as breech presentation after internal podalic version if the fetus does not have longitudinal lie, or as cephalic presentation after external cephalic version.[18-23]

   For a nonvertex second twin of very low birth weight (<1,500 g), the mode of delivery is controversial. No randomized studies have compared vaginal and cesarean birth in these infants.
3. *First twin nonvertex:* Cesarean delivery is often advised and preferred in such cases.[24]

Postnatal Care

Breastfeeding should be encouraged and extra support should be provided to the mother to assist with infant care in hospital and at home. Contraceptive advice should be adequately provided.

MANAGEMENT OF GESTATIONS WITH HIGH FETAL NUMBER

The majority of the spontaneously conceived triplet pregnancies are trichorionic triamniotic but 44% are dichorionic triamniotic (Adegbite et al. 2005). The mean gestational age at delivery for triplets is 32–33 weeks; and for quadruplets, it is 30–32 weeks. The incidence of fetal growth retardation is 15%. Other frequent problems are antepartum anemia, postpartum bleeding and pre-eclampsia. Cesarean section is common due to difficulty in ensuring adequate monitoring of all babies during labor.

Twin-to-twin transfusion syndrome (TTTS): It is a rare complication in monozygotic monochorionic twins which occurs due to vascular communication between both the twins. As a result, the donor twin becomes thin and undernourished, while the recipient twin grows at the expense of donor twin. The treatment options available are reduction amniocentesis, septostomy, selective laser ablation of the placental anastomotic vessels, selective cord coagulation, etc.

Acardiac twin or trap syndrome: Twin reversed arterial perfusion syndrome is an unusual form of TTTS. In these monochorionic twins, one twin, develops normally, while the

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other twin, known as acardiac twin fails to develop a heart and other body parts. This twin acts as a recipient and depends on the normal donor (pump) twin for obtaining its blood supply via transplacental anastomoses and retrograde perfusion of the acardiac umbilical cord. Diagnosis is by the Doppler verification of the reversed flow in the umbilical cord of the acardiac fetus. Radiofrequency ablation of a major blood vessel in the acardiac fetus often serves as the treatment of choice.

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