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AOGD BULLETIN

"Women's wellness-From tiny heartbeats to timeless strength"

THEME: TWICE THE JOY, TWICE THE RISK: RETHINKING MULTIPLE PREGNANCY

AOGD SECRETARIAT
Department of Obstetrics and Gynaecology
Lady Hardinge Medical College & Associated Hospitals, New Delhi-110001
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AOGD 2025

47th Annual Conference of AOGD

Organised By: Department of Obstetrics and Gynaecology
Lady Hardinge Medical College & Associated Hospitals, New Delhi

Venue: India Habitat Centre, New Delhi

Theme - *Tiny Heartbeats to Timeless Strength - Honouring the Journey of Women Through Birth & Beyond*

Pre Conference Workshop- 11th & 12th Sep 2025
Main Conference - 13th to 14th Sep 2025

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From the President's desk

Greetings from AOGD

The 47th annual conference of AOGD is on 13th and 14 th Sep2025 at India Habitat centre.It will be proceeded by 14 enthusiastic pre congress workshops on 11th & 12th sep2025 at various hospitals

Please block the dates.

The scientific programme given in this issue is broad based and will be of interest to everybody. The registration process has begun. Please encourage postgraduate students to present papers/ posters.I request all AOGD members to register in large number .

This issue is focussed on Multifetal pregnancy Edited by Dr Manisha and her team .I hope you find it informative and of interest.

Happy reading.

Dr Reena Yadav

President AOGD

From the Secretarial Desk

Dr Ratna Biswas
Honorary Secretary

Dr Sharda Patra
Joint Secretary

Dr Swati Agrawal
Joint Secretary

Dr Anuradha Singh
Joint Secretary

Dear Members,

Greetings from AOGD secretariat at Lady Hardinge Medical College!

We are delighted to share that the month of May witnessed a spurt of educational and public awareness activities by AOGD members adding on to the momentum gained in the previous month.

Swastha Nari Abhiyaan Yatra & CME on Breast and Cervical Cancer Awareness: A FOGSI Presidential initiative was organized with great fervour by the AOGD Office bearers of LHMC. The event culminated with the Yatra and handing over of the "Flame of Knowledge and Public Service" to the Jaipur Society who in turn will hand it over to the next team. Thalassemia Awareness Day and Preeclampsia Day were celebrated by Fetal Medicine & Genetics Subcommittee by organizing Webinars and Menstrual Hygiene Day was celebrated by Community Health and Public Awareness subcommittee through its outreach activities of public education and distribution of free sanitary pads. Masterclass on ovulation induction and IUI was the final highlight of the month organized by Lady Hardinge Medical College.

Please gear up for the upcoming 47TH ANNUAL CONFERENCE OF AOGD scheduled on 13th & 14th September 2025 and Pre Conference Workshops on 11 & 12th September 2025. Avail the early bird registration benefit which closes on 30th June 2025. Showcase your research talent by submitting your abstracts and get an opportunity to win exciting medals & prizes under different sections. The themes for free communication are: *High Risk Obstetrics *Gynaecological Oncology *Endoscopy *Reproductive Endocrinology *Miscellaneous

The scientific program promises to be an interesting mix of contemporary practice and recent advances in obstetrics and gynecology. It features Orations, Keynote lectures, Panel discussions, Symposiums, Controversies ,Debates, Video-session, Quiz, Competition paper and much more.

Please visit website for details. The registration form, scientific program and abstract submission guidelines have been shared in the Bulletin as well. We request you to register in large numbers and make the event a mega success.

AOGD bulletin, June issue on Multiple Pegnancy focusses on abnormalities of multiple gestation and its management. I congratulate Dr Manisha and the editorial team for yet another interesting issue and wish them the very best in their endeavours.

AOGD Secretariat

From the Editor's Desk

Dr Pikee Saxena

Dr Manisha Kumar

Dr Vidhi Chaudhary

Dr Shilpi Nain

Dr Apoorva Kulshreshtha

Dr Divya Gaur
Co-editor

Respected seniors and dear friends

Greetings to all

With immense pleasure we from LHMC present you the second issue of this academic extravaganza. The theme of this issue is Twice the Joy, Twice the Risk: Rethinking Multiple Pregnancy.

Multiple pregnancies have always captured the imagination—with their promise of double the delight and the miraculous wonder of two (or more) lives growing side by side. Yet, behind the scenes of this joyous anticipation lies a complex clinical narrative: one of heightened vigilance, nuanced decision-making, and considerable risk.

In this issue, the spotlight is turned onto multiple gestations, an area of obstetrics that has evolved dramatically over recent decades. With the widespread use of assisted reproductive technologies and delayed childbearing, the incidence of multiple pregnancies has increased—bringing with it both promise and peril. These pregnancies are associated with a higher incidence of maternal complications such as preeclampsia, anaemia, and postpartum haemorrhage, as well as perinatal risks including preterm birth, low birth weight, and twin-to-twin transfusion syndrome in monochorionic twins.

This themed issue explores the complex challenges of screening for aneuploidy, dealing with discordancy of twins; also focussing on ethical issues associated with selective reduction. Keeping abreast with the recent advancements in the diagnosis, monitoring, and management of multiple pregnancies. On one hand physician's have to respect women's right to autonomy and informed decision making, on other hand they may also have obligations to the well-being of the viable fetus irrespective of the parental choice on termination of pregnancy or selective foeticide.

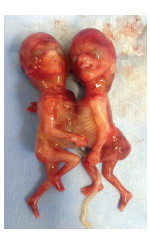
From cutting-edge fetal surveillance strategies and interventions such as fetoscopic laser photocoagulation, to special growth charts for twins, our contributors present comprehensive, evidence-based perspectives on this critical and evolving domain of maternal-fetal medicine.

We are entrusted with the responsibility of connecting innovation with compassion, and ensuring that scientific progress remains grounded in human understanding. We hope this issue encourages renewed reflection on the complexities that defines multiple pregnancies and also promotes ongoing research in this important and evolving field.

We thank all authors from the bottom of our hearts for their dedication in making this issue both informative and engaging. As always, we welcome your feedback to help us improve with each edition.

Thank you for your continued support.

Warm regards,
The Editorial Team



47th Annual AOGD Conference

13th & 14th September 2025

Scientific Program 13.09.2025 Day 1

Time	Hall A - Stein Auditorium	Hall B – Jacaranda	Hall C –Magnolia & Maple Room
08:00-09:00 am	**Registration**		
	Topic	**Topic**	
09:00-10:00 am	**Session 1: Controversies in Obstetrics**	**Session :1 : Controversies in Gynaecology**	
09:00-09:15am	Fetal intrapartum CTG Monitoring in Low-Risk Pregnancies – Overuse or Essential?"	Vaginal Rejuvenation and Cosmetic Gynecology – Should It Be a Priority ?	
09.15 - 09.30 am	Cesarean on Demand – A Woman's Right or Medical Malpractice?	Should women without symptoms or risk factors have regular pelvic examination ?	**Free**
09:30-09:45 am	Role of Ultrasound – Too Much Screening or Essential for Fetal Health?	Fertility Preservation – Should it be Standard Practice for Women with Cancer ?	
09.45-10.00am	Discussion	Discussion	
10:00-11:00am	**Session :II Case based Panel discussion**	**Session :II Case based Panel discussion**	
	When Infection Strikes – Obstetric Sepsis and Emerging Threats	Pelvic Masses Demystified – Malignancy or Mimic?	
11:00-12:00 noon	Session :III Key note lectures		
	Critical Crossroads in High-Risk Obstetrics – Navigating Dual Lives with Precision and Compassion	Surgical Innovation in Gynecology – Laparoscopy, Robotics and Beyond"	
11.00-11.15am	Managing Cardiac Disease in Pregnancy – Walking the Tightrope Between Physiology and Pathology	Next-Gen Laparoscopy – Smarter, Safer, Sharper	
11.15-11.30am	Severe Preeclampsia and HELLP Syndrome – Early Clues, Timely Action, Better Outcomes	Robotic Gynecology – Expanding Access, Redefining Precision	**Paper**
11.30am-11.45	Predicting and Preventing Preterm Birth – From Cervical Length to Progesterone Protocols	"Digital Surgery, AI, and the Operating Room of the Future"	
11.45-12.00 noon	Discussion	Discussion	
12.00-12.30pm	**Brigadier Khanna Oration**		
12.30-01.00pm	**FOGSI President Oration**		
01.00-01.30pm	**Inauguration**		
01.30-02.15pm	**Lunch**		
02.15-03.15pm	Session IV Panel cum Symposium :	Panel cum Symposium	
	Saving the Second Twin – Challenges in Multifetal Delivery	"Adenomyosis – The Overlooked Twin of Endometriosis"	
02.15-02.25 pm	When to Deliver Twins – Timing It Right	Emerging imaging criteria: transvaginal USG vs MRI	
02.25-02.35 pm	Second Twin in Breech or Transverse – What's the Best Route	Newer medical options and uterine-sparing interventions	
02.35-02.45 pm	Cord Prolapse and Fetal Distress – Real-time Decision Making	Managing adenomyosis in women desiring fertility	
02.45-03.25pm	Panel discussion -Case scenarios with discussion	Panel discussion -Case scenarios with discussion	
	Saving the Second Twin – Challenges in Multifetal Delivery-Case scenarios with discussion	"Adenomyosis – The Overlooked Twin of Endometriosis"	**Session**
03.25-03.30 pm	Discussion	Discussion	
03.30 - 04.00 pm	**Session V (A) : Surgical videos in Obstetrics**	**Surgical Videos in Gynaecology**	
	Topic: Difficult Cesarean Section	Topic: Precision and Progress in Gynecologic Surgery	
03.30-03.40 pm	Difficult Cesarean with Previous Scar : Techniques for Safe Delivery	Step by step staging laparotomy in ovarian malignancy	
03.40-03.50 pm	Cesarean Section in Cases of Obstructed Labor	Radical Hysterectomy with Pelvic Lymphadenectomy for Cervical Cancer"	
03.50-04.00 pm	Managing Placenta Accreta During Cesarean Section	Simple vulvectomy	
04.00-04.40 pm	**Session V (B) : Cutting-Edge Obstetric Surgery – Saving Lives, Preserving Futures**	**Laparoscopic & Hysteroscopic Video Topics in Gynecology**	
04.00-04.10 pm	Ultrasound-Guided Percutaneous Umbilical Blood Sampling (PUBS) for Fetal Diagnosis	Total Laparoscopic Hysterectomy (TLH): Step-by-Step for a Difficult Uterus	
04.10-420 pm	POCUS in Obstetric Emergency Protocols for Pulmonary Edema and Hypertensive Disorders	Laparoscopic Adenomyomectomy	
04.20-04.30 pm	Cesarean Myomectomy – New Evidence & Safer Technique	Hysteroscopic myomectomy	
04.30-04.40 pm	Laparoscopic Cervico-isthmic Cerclage in Second Trimester	Laparoscopic Sacrocolpopexy for Vault Prolapse	

47th Annual AOGD Conference

13th & 14th September 2025

Scientific Program 14.09.2025 Day 2

Time	Hall A	Hall B	Hall C – Maple Room
08:00-09:00 am	**Registration**		
	Topic	**Topic**	
09:00 -10:00 am	**Session 1: Symposium: Hormonal Harmony: Redefining Care in Reproductive Endocrinology**	**Session :1 : Simulation :The Golden Hour in Obstetrics – Rapid, Resilient, and Revolutionary Response Protocols"**	**Free**
09.00-09.15am	Modern diagnostic dilemmas – adolescent vs adult PCOS	"Postpartum Hemorrhage Protocols – From Chaos to Control"	
09.15-09.30 am	When to suspect pituitary or adrenal pathology in menstrual disorders	"Shoulder Dystocia and Cord Prolapse – Saving Seconds, Saving Lives"	
09.30-09.45 am	"Navigating Premature Ovarian Insufficiency – Restoring Hope, Not Just Hormones"	"Eclampsia and Hypertensive Crises – Stabilize Before You Deliver"	
09.45-10.00am	Discussion	Discussion	
10:00-11:00 am	**Session :II, Panel discussion**	**Session :II Panel Discussion**	
	"Obesity, Insulin Resistance, and Infertility: A Reproductive Endocrine Triangle"	"Labor That Stalls – Dystocia Dilemmas in Real Time"	
11:00-12:00 noon	**Session :III Debate**	**Session :III Debate**	
11.00-11.25am	Routine HPV Vaccination in Adults Over 26: Beneficial or Unnecessary	Non-invasive Prenatal Testing (NIPT) for All	
11.00-11.10 am	For -Beneficial	For	
11.10-11.20 am	Against -Unnecessary	Against	**Communications**
11:20-11:25 am	Discussion -5mins	Discussion	
11.25-11.50 am	Should Opportunistic Salpingectomy Be Routine for Ovarian Cancer Prevention	Universal Aspirin Use in Pregnancy: Prevention or Overprescription	
11.25-11.35 am	Yes	Prevention	
11.35-11.45 am	No	Overprescription	
11:45-12:00 noon	Discussion 5mins	Discussion 5mins	
12.00-01.00pm	**Session IV "The Vaginal Route Reimagined – From Classical Mastery to VNOTES Innovation"**	**Session IV Game changer Guidelines in Obstetrics & Gynaecology**	
12.00-12.25pm	VNOTES Hysterectomy	12:00-12:10 pm -Management of Intraamniotic Infection	
12.15-12.30pm	VNOTES Adnexal Surgeries	12:10-12:20 pm - Third Trimester Ultrasound	
12.30-12.45pm	VNOTES Adhesiolysis	12:20-12:30 pm - CIN2 Conservative management	**Session**
12.45-01.00pm	Discussion	12:30-12:40 pm - AUB Classification- FIGO 2023	
		12:40-01:00 pm - Discussion	
01.00-01.30pm	AOGD Past President Oration		
01.30-02.15pm	**Lunch**		
02.15-03.15pm	**Session V: Competition aper**	**Session V- Fertility, Contraception & Beyond – Clinical Priorities in 20s and 30s**	
		Fertility preservation for late motherhood and career planning	
		Contraceptive choices: tailoring to lifestyle and comorbidities	
		Preconception health – optimizing before the bump	
3.15-4.15 pm	**Session VI-: Quiz-Final round**	**Session VI- Unmasking the Hidden- Unusual /rare case -Invited Talks**	
4.15 pm onwards	**Valedictory & Vote of Thanks**		

Screening for Aneuploidy and Preeclampsia in multiple pregnancy

Reena Yadav, Kanika Chopra
Department of obstetrics and gynaecology, LHMC & SKH Delhi

Introduction

The incidence of multifetal pregnancies has increased markedly in last 4 decades. Major reason for its increase is increasing maternal age because of late childbearing and increased use of artificial reproductive techniques for conception. Zygosity refers to genetic identity of each twin and chorionicity relates to its placentation. Occurence of spontaneous monozygotic twin is stable worldwide. Infertility treatments are associated with 2-12 fold increase in monozygotic twinning[1].

Screening for aneuploidy in Multifetal pregnancy-

Twin pregnancies present unique challenges to aneuploidy screening, and no method of screening for aneuploidy in twins is as accurate as in singleton pregnancies.

- Chorionicity has a major impact on the prenatal screening process and should be determined by ultrasound in the first trimester of all twin pregnancies. (II-2A)

Maternal age:

As with singleton pregnancies, only maternal age is not recommended as a screening method in twins and should not be the basis of performing invasive testing in twin pregnancy.

Nuchal translucency and CRL

Nuchal translucency can be determined separately for each twin. Fetal nuchal translucency combined with maternal age is an acceptable first trimester screening test for aneuploidy in twin pregnancy (Level 11-2 evidence). NT measurement along with maternal age is the method of choice for prenatal aneuploidy screening in higher order multiple pregnancies.

In monochorionic twins, each fetus has the same risk of being affected. Therefore, the NT measurements are averaged to calculate a single risk estimate for the entire pregnancy using same NT values as for singletons. In dichorionic twins, NT and CRL of each fetus is taken into calculation, and separate risk is given. [2-4]

Nuchal translucency with Serum markers in the first trimester:

Combining NT measurement with first-trimester maternal serum markers (pregnancy-associated plasma protein A [PAPP-A] and free human chorionic gonadotropin [hCG]) in twins provides an improvement in the DR compared with NT alone. In the first trimester Maternal serum markers are approximately twice as high in twins as in singletons. Therefore screening in twins requires adjustment of the calculated multiples of the medium to account for presence of two fetuses [5]. One meta-analysis suggested that first-trimester combined screening in twins has a DR of 89% with an FPR of 5.4%, which is similar to singleton.

- First trimester serum screening combined with nuchal translucency may be considered in twin pregnancies.
- It provides some improvement over the performance of screening by nuchal translucency and maternal age by decreasing the false-positive rate. (II-3)

Maternal serum screening in the second trimester

Second trimester Down syndrome screening in twins is feasible and better than screening based on maternal age alone. Muller et al, studied 11040 pregnancies and concluded that when both twins were affected, detection rate was 71%, and when only one was affected, detection rate was 60% at false positive rate of 10%. If NT screening is not available or has been missed because of the late diagnosis of a twin pregnancy (after 14 weeks), second trimester maternal serum screening may be considered in twins.

Integrated screening with nuchal translucency plus first and second trimester serum screening is an option in twin pregnancies. Further prospective studies are required in this area, since it has not been validated in prospective studies in twins.

Cell free DNA in twin pregnancies

Similar to Singleton, woman with multiple pregnancies have cfDNA derived from trophoblast in their maternal circulation. Although, the fetal fraction of cfDNA in the maternal plasma is higher in twin pregnancies, the individual contribution from each fetus is lower than for singleton pregnancies. The overall increased cfDNA fetal fraction should lead to equivalent or improved detection rates in monozygotic twins who almost always have the same genotype. However, a lower fetal fraction will potentially make aneuploidy detection more challenging in dizygotic twins among whom aneuploidy is likely to affect only one fetus. Single nucleotide polymorphism (SNP) analyses in twin pregnancies have demonstrated that the individual cfDNA concentrations contributed by each fetus only moderately correlate with each other and there is a possibility that one fetal fraction can be high and the other below the cutoff for reliable testing. Vanishing

twin can be identified through SNP based cf–DNA analysis. Although there is lack of large prospective trial, however, in direct evidence concludes that cf DNA testing improves screening for fetal trisomy in twin pregnancies.[7-8] CF-DNA testing compliments and does not replace first trimester ultrasound screening in multiple gestation pregnancies . Together with ultrasound, and NIP Facilitate early diagnosis of serious adverse conditions and allows couple to plan the course of pregnancy.[9]

Preeclampsia Screening in multifetal pregnancy –

Pre-eclampsia affects nearly 10% of twin pregnancies increasing the risk of maternal and fetal morbidity and mortality.[10] In the study by Chen et al difference in accuracy of preeclampsia screening between monochorionic and dichorionic twins was observed, suggesting that chorionicity may need to be included while using these models for clinical purposes. In the models combining maternal factors, Line MAP, PI and PlGF, the detection rates of preeclampsia requiring delivery at <32, <37 and 2 weeks of gestation in twin pregnancy were 100%, 99% and 97%, but at a screen-positive rate of 75%.[10]

Maternal preexisting risk factors are mentioned in box 1. Traditionally, risk stratification has been based on checklists of risk factors identified from maternal characteristics, medical and obstetric history. Pregnant woman with one or more high risk factors and two or more moderate risk factors are considered to be high risk for pre-eclampsia. Both NICE and ACOG guidelines recommend starting aspirin prophylaxis (150 mg from 12 weeks of gestation till delivery) in pregnant woman identified as high risk for pre-eclampsia based on these.[11,12]

Box 1: Maternal risk factors for pre-eclampsia

High risk factors	Moderate risk factors
• Preeclampsia in previous pregnancy • Autoimmune disease such as systemic lupus erythematous and antiphospholipid syndrome. • Type 1 or 2 diabetes mellitus • Chronic hypertension • Chronic kidney disease	• First pregnancy • Maternal age > 40 years • Pregnancy interval > 10 years • BMI> 35kg/m2 • Family history of preeclampsia • Multiple pregnancy

Blood pressure measurements appear to follow similar trends in singleton and twin pregnancies. Role of mean arterial pressure (MAP) is comparable between the two[13-15] and can be used in the prediction of pre-eclampsia. MAP is found to be elevated as early as 11-14 weeks gestation in twin pregnancies at high risk for early onset pre-eclampsia.[16,17] Uterine artery pulsatility index measured in the first trimester (11-14 weeks) is found to be significantly increased in twin pregnancies that are at high risk of developing early onset pre-eclampsia but not in cases with late-onset preeclampsia.[16,17]

Levels of PAPP-A, Sflt-1, and PLGF are doubled in twin pregnancy as compared to singleton. But, in cases at high risk of developing pre-eclampsia, the PLGF is significantly lower and PAPP-A levels higher as compared to unaffected twin pregnancy.[18]

FMF in 2017 proposed to use competing risk model used for prediction of pre-eclampsia in singletons for twins with adaptation. But validation studies thereafter demonstrated that the use of these risk models overestimated the risk of pre-eclampsia in twin pregnancies and have high false positive rates. Also, as in singleton pregnancy, those identified as high risk for pre-eclampsia benefit from use of aspirin, no similar studies are available for twin gestation.[17] Another new model has been developed and validated in 1798 pregnancies. This model has demonstrated reasonable calibration with good agreement between observed and predicted risk. This model also consists of maternal characteristics, MAP, UtA-PI and PLGF and has a detection rate of 75% and high FPR of 40%. [19]

Although twin pregnancies are a significant risk factor for preeclampsia, the appropriate method of screening to identify those at risk in this population group remains elusive despite improvements in screening algorithms. Furthermore, whilst the benefit of screening and aspirin prophylaxis in singletons is well established, the role of aspirin in twins is uncertain[20].

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CRL and NT discrepancy in twin pregnancy

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The 11-13 weeks scan is an important scan in all pregnancies and especially in multiple pregnancy. It is used for gestational age estimation, aneuploidy screening and detecting major congenital malformations. It also detects the number of embryos and the chorionicity and amnionicity in these pregnancies. This is required for planning the antenatal care and also for prognostication. Twin pregnancies are at risk of preterm labour, fetal anomalies, discordancy in growth and other complications related to chorionicity like twin-twin transfusion syndrome, twin reversed arterial perfusion etc. One important finding in the 11-13 week scan in twin pregnancy may be the discrepancy in CRL (crown rump length) or NT (nuchal translucency) between the twins.

Discrepancy in CRL in twin gestation

In twin gestation, since both the fetuses have been conceived at the same time, the two CRLs should be similar. But, many times the size of the two CRLs may be different. The discordance is calculated as follows:

CRL of larger twin - CRL of smaller twin / CRL of larger twin *100.

Studies have defined discrepancy in CRL as >10% difference in size of the two CRLs measured at 11-13+6 week scan.[1] Some studies have further classified CRL discordancy as moderate discordancy (10-16%) and severe discordancy (≥ 16%).[2,3] In a study of 6225 twin pregnancies, the median CRL discordancy at 11-14 weeks in MCDA ,DC, and MCMA twin pregnancies was 3.6%, 3.2%,and 2.9% respectively. Only 1% of the twin gestations had a discordancy in CRL of more than 20%.[4]

Clinical implications of CRL discrepancy

Dating of fetuses by CRL

Similar to the case of singleton pregnancies, spontaneous twin conceptions may require dating by CRL as in cases of forgotten LMP dates or irregular cycles. Twins conceived on ART, may be dated by ET dates. However, the reported rates of CRL discrepancy is around 3-4% in twin gestation at 11-14 weeks gestation with around 1% having a discordancy of more than 20%.[1] The incidence of CRL discordancy was similar for MCMA and DC twins but was significantly higher in MCDA twins.[4] The question arises which CRL to be used for estimating the gestational age- smaller, larger or mean CRL?[5]

In studies done on twins conceived with artificial reproductive techniques, the CRL of the smaller twin correlated well with the gestational age of the fetuses.[6,7] However, with spontaneous conceptions, using the CRL of the smaller twin may result in underestimating the gestational age and hence, missing the diagnosis of growth restriction.

If the CRL of the larger twin is chosen, it may result in unnecessary labelling of the smaller twin as growth restricted leading to increased antenatal surveillance leading to more costs and anxiety for the parents and care givers. However, a study by De Young et al, showed that using the CRL of the larger twin did not increase the proportion of neonates being labelled as small for gestation.[8]

Taking into account the current evidence, most guidelines have recommended the use of CRL of the larger twin for calculating the gestational age.[9,10]

Adverse outcomes associated with CRL discrepancy

CRL discrepancy in twins has been associated with adverse perinatal outcomes like weight discordancy, fetal anomalies, preterm deliveries and even fetal loss.[11,12] In a cohort of 471 twin pregnancies, there was a 8-11% increased rate of chromosomal and structural anomalies in CRL discordant twins, rate of spontaneous fetal loss was 15% in discordant and 4.1% in concordant twins and association of CRL discordance with birthweight discrepancy.[2]

In a large retrospective study including 6225 twin pregnancies which included both monochorionic and dichorionic twin pregnancies, adverse outcomes like fetal death at <20 and <24 weeks, perinatal death at ≥ 24 weeks, preterm deliveries, small for gestation fetuses and discordant birth weight were found to be much higher in CRL discordant twins.[4] A metaanalysis by Antonio et al also had similar results except no association of CRL discordancy with fetal loss at <24 weeks.

In a study of 987 dichorionic twins, the prevalence of structural anomalies and aneuploidies were higher in twins with >10% discordancy in CRL.[13] They also found a higher incidence of adverse pregnancy outcomes after controlling for structural anomalies.

The predictive performance of CRL discordance for each adverse outcome was also studied and has been found to be poor indicating that though CRL discordancy is not a good screening test for adverse pregnancy outcomes but

larger discordancy is associated with fetal losses.[2]

The structural anomalies associated with discordant CRL are cardiovascular defects, abdominal wall defects and centra nervous system defects.[14] Discordany in CRL earlier than 11 weeks has also been studied. A study by Antonio et al in fetuses with discordant CRL at 7 to 9+6 weeks was associated with single fetal loss in the first trimester with detection rate of 74% for a false positive rate of 5%.[15]

Discrepancy in NT in twin gestation

Discrepancy in NT is defined similar to discrepancy in CRL i.e.

NT of larger twin-NT of smaller twin/NT of larger twin *100.

Discordance in NT may be the result of discordant CRL as the NT normally increases as the fetus grows or it may reflect pathological conditions such as abnormal blood flow in one of the fetuses secondary to placental vascular anastomoses. NT may be >95th centile in both fetuses or there may be a discordancy between the two twins but within the normal range.

In singleton pregnancies, NT> 95th centile is significantly associated with anomalies. In MCDA twins, the incidence of high NT (10.4%) is significantly higher than in DC twin pregnancies (8.3%). Twin gestation with NT>95th centile have been found to be associated with fetal chromosomal abnormalities and this risk is more in monochorionic twins as compared to dichorionic.[16]

Also, for monochorionic twins, NT discordancy is associated with severe TTTS in later gestation. In a study of MCDA twins. The sensitivity, specificity, positive and negative predictive value for the development of TTTS is 52-64%, 78-80%, 50% and 86% respectively for a NT discordancy of >20%.[17] The risk of development of severe TTTS and fetal death is more than 30% in such cases. However, if NT discordance is <20%, the risk of complications is <10%. In 70% cases with discordant NT, features of TTTS may not develop as explained by the hypothesis of 'asymmetric reduction in placental anastomoses.[18] According to this theory, in monochrionic pregnancies, there are a large number of bidirectional anastomoses in early gestation which spontaneously close as pregnancy advances. In some cases, there may be an asymmetry in these AV anastomoses resulting in differential blood flow in one of the fetuses. NT or CRL discrepancy in the first trimester may indicate this asymmetry and as gestation advances, spontaneous closure of the anastomoses may result in resolution of these early features of TTTS.

Learning points

- Proper measurement of CRL and NT in the first trimester in twin gestation is very important. In cases of discordancy in CRL or NT measurement of the twins, fetal medicine expert opinion should be sought. The risk of adverse pregnancy outcomes should be explained.
- A detailed ultrasound should be done for any anomalies. If fetal anomalies are detected, aneuploidy testing may be required.
- The risk of complications should be explained so that informed decision making regarding aneuploidy testing can be done by the parents.
- In MCDA twins, discordant NT indicates more intense surveilliance for the development of TTTS and early intervention like laser coagulation would be appropriate.

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Role of NIPT in twin, triplet and vanishing twin

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Intoduction

Twin pregnancies are associated with an elevated risk of complications and adverse outcomes, necessitating meticulous prenatal management and accurate screening for chromosomal abnormalities. However, twin pregnancies pose distinct challenges for prenatal screening due to limitations inherent in traditional screening methods.

Serum marker levels can be affected by the presence of two fetuses, complicating result interpretation. Furthermore, nuchal translucency screening for aneuploidy exhibits a higher false-positive rate in monochorionic twins compared to dichorionic twins, potentially due to increased nuchal translucency being an early manifestation of twin-to-twin transfusion syndrome (TTTS)[1].

Additionally, women carrying twins, particularly those conceived through assisted reproductive technology (ART), may be hesitant to undergo invasive testing due to concerns about procedure-related risks of pregnancy loss, as suggested by studies.

Role of NIPT in Twin Pregnancy

NIPT has revolutionized prenatal screening for chromosomal abnormalities. By analyzing cell-free DNA (cfDNA) in the mother's blood, NIPT can detect the presence of aneuploidy, such as trisomy 21, 18, and 13. In twin pregnancies, NIPT offers several advantages over traditional screening methods. NIPT has been shown to have higher detection rates and a lower false positive rate compared to traditional screening methods, reducing the need for invasive testing and associated risks[2].In multiple pregnancies, cell-free DNA (cfDNA) from trophoblasts circulates in the maternal bloodstream, offering a direct reflection of the fetuses genetic makeup . As monozygotic (MZ) twins are genetically identical, the presence of a genetic anomaly in one typically suggests a parallel risk in the co-twin. In contrast, dizygotic (DZ) twins, with distinct genetic profiles akin to those of siblings, necessitate individual risk assessments.

In dichorionic twin pregnancies, where each fetus possesses its own placenta, disparities in placental mass between the normal and aneuploid fetuses can occur. This discrepancy may lead to a dilution effect, wherein the abnormal DNA from the affected fetus is diluted by the larger placental mass of the normal fetus, potentially masking the aneuploidy. To mitigate this challenge, it is advisable to measure the fetal fraction for each fetus separately and establish cutoff levels based on the fetus with the lowest fetal fraction. Single nucleotide polymorphism (SNP) analysis can distinguish between maternal and fetal DNA sequences and in dizygotic twin pregnancies, assess cfDNA from each fetus[3]. By enhancing detection rates and reducing false negatives, this strategy is particularly beneficial in dichorionic twin pregnancies. However, the adequacy of fetal fraction remains a significant concern when screening for conditions like trisomy 18, trisomy 13, and digynic triploidy (when included), as these are often associated with lower fetal fractions due to diminished placental mass.

SNP-based NIPT can determine zygosity, providing valuable guidance for pregnancy management, especially when ultrasound chorionicity assessment is uncertain or in late-diagnosed twin pregnancies.

Vanishing twins can also be detected through NIPS[3]. However, limitations include the inability to specify which twin is affected and also limited screening for sex chromosome abnormalities. Laboratories often restrict testing for sex chromosome abnormalities due to mosaicism and potential false positives. NIPS results require cautious interpretation, particularly for X-chromosome aneuploidies

SINGLETON PREGNANCY		
	DR	FPR
Trisomy 21	99.7%	0.04%
Trisomy 18	97.9%	0.04%
Trisomy 13	99%	0.04%

TWIN PREGNANCY		
	DR	**FPR**
Trisomy 21	99% (92%-99.9%)	0.02%
Trisomy 18	92.8% (77.6%-98%)	0.01%
Trisomy 13	94.7% (9.1%-99.9%)	0.10%

Gil et al. Ultrasound Obstet Gynecol. 2021. Meta analysis

Recommendations

Based on the current evidence, the following recommendations can be made:

Cell-free DNA screening can be performed in twin pregnancies. Overall, performance of screening for trisomy 21 by cell-free DNA in twin pregnancies is encouraging, but the total number of reported affected cases is small. Given the small number of affected cases it is difficult to determine an accurate detection rate for trisomy 18 and 13. In multifetal gestations, if a fetal demise or vanishing

twin, there is a significant risk of an inaccurate test result if serum-based aneuploidy screening or cell-free DNA is used. (ACOG 2025)

NIPT in vanished twin – Not recommended. Risk of aneuploidy is high in vanished twin and the abnormal vanished twin placenta may still release DNA, leading to false +ve for the remaining normal twin. NT in combination with maternal age should be used for risk estimation. An alternative could be NT in combination with maternal age and free Beta HCG level[4].

NIPT in Triplet and higher order pregnancy: Non-invasive prenatal testing (NIPT) is not typically recommended for triplet and higher order pregnancies.

cfDNA testing serves as a complementary tool to first-trimester ultrasound screening in multiple gestation pregnancies, rather than a replacement. Ultrasound provides crucial information on chorionicity, identifies maternal pathology (e.g., Mullerian anomalies, adnexal masses), and detects fetal abnormalities (e.g., increased nuchal translucency, major structural congenital anomalies like anencephaly), all of which significantly impact multifetal gestation outcomes.

Non-invasive prenatal testing (NIPT) offers superior aneuploidy screening and zygosity information. The combined use of ultrasound and NIPT enables early diagnosis of severe conditions, allowing couples to plan their pregnancy course or consider options like pregnancy termination or fetal reduction.

GUIDELINE	NIPT for Twins
ACOG/SMFM	Recommended
ISUOG	Recommended
FIGO	More evidence
ISPD	Recommended
RCOG	Further evaluation needed (draft)

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Prevention of iatrogenic multiple pregnancy

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Introduction

The epidemic of twins and high-order multiples across the world is mostly iatrogenic. The incidence of twins among births resulting from infertility treatments is more than 20 times greater than that from natural conception, and that of high-order multiple gestation is more than 100 times higher.[1] Older maternal age, delayed child bearing has led to increased prevalence of infertility and hence unprecedented use of ovarian stimulation causing development of multiple oocytes. In cases of medically assisted reproduction multiple embryos may be transferred to increase the likelihood of a successful pregnancy after in vitro fertilization. The use of assisted conception techniques increases the frequency of monozygotic twinning and associated pathology.

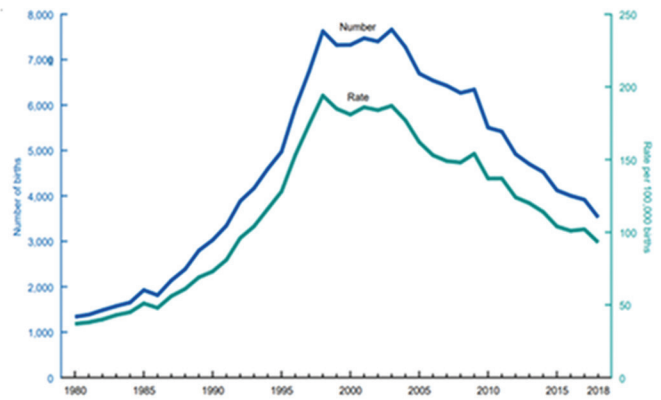

Fig 1- The trend in higher order multiple (triplet or higher) birth in USA from 1980-2018.

Blue line is absolute number, Green line –is higher order multiple gestation rate[3]

These trends, in USA are clearly related to the increasing use of ovarian stimulation , number of embryos transferred in ART cycles, reflecting ART success rates.

Complications of multiple gestations

Common maternal complications are listed in table 1[2]

TABLE 1: Incidence (%) of major maternal complications

	Singleton	Twin	Triplets	Quadruplets
Pre-eclampsia	6	10-12	25-60	>60
GDM	3	5-8	7	>10
Preterm labour	15	40	75	>95
Delivery at <37 wks.	10	50	92	>95
Delivery at< 32 wks	2	8	26	>95

Fetal complications

As the number of foetuses increase in multiple pregnancy the risks of foetal demise in third trimester, preterm birth and perinatal mortality also increases. (Table 2)

Table 2 Major perinatal morbidity and mortality outcomes in multiple pregnancies[3]

	Singleton	Twin	Triplet
Prospective risk of fetal death(%)	0.03	0.09	0.14
Neonates< 2,500g(%)	6.2	53.2	93.2
Neonates <1,500g(%)	1.2	10.5	37.5
Average gestational age (wk)	39.1	35.3	32.2
Average birth weight(g)	3,358	2,347	1,687

Financial Impact of Multiple Pregnancy

Financial implications for a family not only include cost of fertility treatment, obstetric and neonatal (intensive) care. It has lifetime costs for chronic medical care, rehabilitation and special education related to extreme prematurity. For a low-birthweight child, the average cost of health care and education up to the age of 8 years is 17-fold higher than the costs for a normal-birthweight child

Why there is increased risk of multiple gestation while treating infertility?

It can be divided as patient related issues which includes delaying pregnancy and afterwards a sense of urgency pushing them towards more aggressive alternatives available. It is debateable whether they want to have twin pregnancy and are willing to accept the risks of increased number of embryo transfer in assisted reproduction. Most health Insurance in our country does not cover IVF cycles and to maximize chance of conception as well as making it seemingly more cost effective a greater number of embryos are transferred. Clinics are also under competitive pressure hence treatment either ovarian stimulation with gonadotropin use or assisted reproduction are commenced early and to maintain high pregnancy rates transferring more embryos seems an easy option

Strategies for limiting the risk of multiple gestation

A. Life style modifications

Patients with a good chance of spontaneous pregnancy should not be offered unnecessary fertility treatments. Chances of spontaneous conceptions are high in such

couples. It has been estimated that 54% of the moderately sub-fertile population will not conceive spontaneously within a year; however, the majority of them (62%) will conceive spontaneously in the next 12 months. Lifestyle changes, such as exercise, weight reduction, stopping alcohol intake and smoking can increase rate of spontaneous conception and hence limiting chance of multiple pregnancy.

Table3 shows a hypothetical model which can help in counselling couples[4]

TABLE 3 Hypothetical model of cumulative spontaneous pregnancy rate in five categories according to duration of subfertility

Category	Cumulative pregnancy rate after		
	6 months	12 months	24 months
Superfertile	100%		
Normal fertile	74%	93%	100%
Moderately subfertile	26%	46%	71%
Severely subfertile	6%	11%	21%
Infertile	0%	0%	0%

B. Strategies in ovulation induction and ovarian stimulation treatments

1. Drugs used for OI

Mostly ovulation induction is done for two reasons. One, in woman with anovulatory cycles such as in PCOD, aim is to make her release one egg. Second, in unexplained infertility one aims for more number of mature follicles. It means treatment has to be individualized. Letrozole, when compared to clomiphene citrate, increased live birth rates without increasing the multiple pregnancy. Also, letrozole resulted in significantly higher live birth rates compared to clomiphene and with a lower incidence of multiple gestation compared to gonadotropins. Low-dose (37.5–75 IU) exogenous gonadotropins can be used in selected cases for ovulation induction, aiming for single follicle. In order to mitigate the risk of multiple pregnancy cycle cancellation is recommended for patients with >2 follicles ≥16 mm or if there are ≥3 intermediate sized follicles. Overall, regardless of which medication or stimulation regimen is used, it may not be possible to eliminate entirely the risk of multiple gestation associated with ovulation induction and superovulation.

2. Laparoscopic ovarian Drilling

The evidence suggests that if the chance of live birth following medical ovulation induction alone is 44%, the chance following LOD would be between 32% and 52%. Moderate-quality evidence shows that LOD probably reduces the number of multiple pregnancies.[5]

C. Strategies for limiting the risk of multiple gestation in ART

1. Single Embryo Transfer

The most direct way to limit the risk of multiple gestation from ART is to transfer a single embryo. Transferring multiple embryos results in higher overall live birth rates per transfer but also causes an increased risk of multiple gestation. Strategies such as PGT-A, freezing only embryo transfer cycles, endometrial synchrony testing, and time lapse imaging and other non-invasive embryo testing are used to improve success. However, evidences are not robust for these tests for routine use. Single embryo transfer, regardless of additional testing, should be considered the gold standard to reduce multiple gestation.

2. Extended culture single blastocyst transfer

The transfer of single blastocyst, has resulted in a substantial decrease in the average number of embryos transferred and in the incidence of multiple gestation (from 35%–19%), while overall pregnancy rates were maintained. However, concerns are- increased risk of monozygotic twin and less number of embryos for cryopreservation.

3. PGT-A

PGT-A has been used as a strategy to enhance selection for embryo. The data on PGT-A are insufficient to recommend its routine use for the purpose of increasing single embryo transfer.

D. Multifetal pregnancy reduction (MFPR)

One of the adverse outcomes for infertility treatment is high-order multifetal gestation. The risk for adverse perinatal and maternal outcomes increases progressively with the number of fetuses. Options available to such couples are: continue pregnancy with associated maternal and fetal complications, terminating the pregnancy; or multifetal pregnancy reduction (MFPR) to reduce the number of fetuses. It decreases the risks associated with preterm delivery. However, because MFPR can present patients with a profound ethical dilemma and cause significant psychologic trauma thorough counselling must be provided. The primary risks of fetal reduction are pregnancy loss and preterm birth. However, as experience with the procedure has grown, the incidence of pregnancy loss and premature birth has declined. It is recommended that it should be performed only in specialized centres with fetal medicine practitioners experienced in doing the

procedure.

Available evidence indicates that MFPR appears to be associated with a reduced risk of prematurity, although the true benefit of this intervention is difficult to enumerate owing to potential bias in interpreting the data.

Do Guidelines Matter ?[6]

In 2017 American society for reproduction revised guideline and strongly recommended single embryo transfer for patient under the age of 38 and for all patients undergoing transfer of euploid embryo. A study compared multiple birth rates before and after the recommendation. It concluded that after implementation of guideline, single embryo transfer rate increased by 49%, multiple birth rate declined by 42% with no change in cumulative live birth rate. Such recommendations make practice safe, ethical and boosts the confidence of clinician.

It is recommended that in women with anovulatory infertility who require gonadotropins, the lowest dose possible be used to induce ovulation of a single follicle. Starting doses of 37.5–75 IU are recommended with small incremental increases as needed on the basis of ovarian response.

Conclusion

The goal of infertility treatment is for each patient to have one healthy child at a time. The challenges associated with achieving that goal differ by treatment and clinical context. Infertility treatments has resulted in increased incidence of multiple birth. Financial implications are huge for a family both in short term and long term. As multiple pregnancies are associated with many maternal and fetal risk, in all infertility treatments strategies should be in place to decrease its incidence. There should be Restriction on the use of ART for patients with a good chance of spontaneous pregnancy. Non-ART infertility treatments, are the greatest contribution to iatrogenic multiple gestation. More efforts are needed to reduce the multiple gestation. It is not recommended to use gonadotropins for ovulatory women utilizing timed intercourse or IUI. Single embryo transfer, regardless of additional testing, should be considered as gold standard to reduce multiple gestation with ART. Patient education and counselling is important so that they understand benefit of safe ovarian stimulation and single embryo transfer. Ethical challenges are there in multifetal pregnancy reduction.

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Management protocols and ethical issues in Discordant non-lethal anomaly

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Introduction

A non-lethal anomaly is either associated with mild or severe morbidity if not mortality. A discordant anomaly refers to a condition wherein only one of the twins has an anomaly or rarely wherein both twins have different anomalies. Structural anomalies are more common in multiple pregnancies than singletons, incidence being 1 in 17 in dichorionic, 1in10 monochorionic and 1 in 5 monoamniotic twin pregnancies. Usually, the anomalies are discordant.[1] Twins have been observed to have an increased risk for specific defects such as anencephaly, hydrocephalus, tetralogy of fallot, pulmonary valve stenosis, coarctation of aorta, cleft lip with or without cleft palate, esophageal atresia with or without tracheoesophageal fistula, anorectal atresia and hypospadias.[2] Chromosomal abnormalities are less common in twin settings as aneuploidy is more likely to end in demise in twin pregnancies.

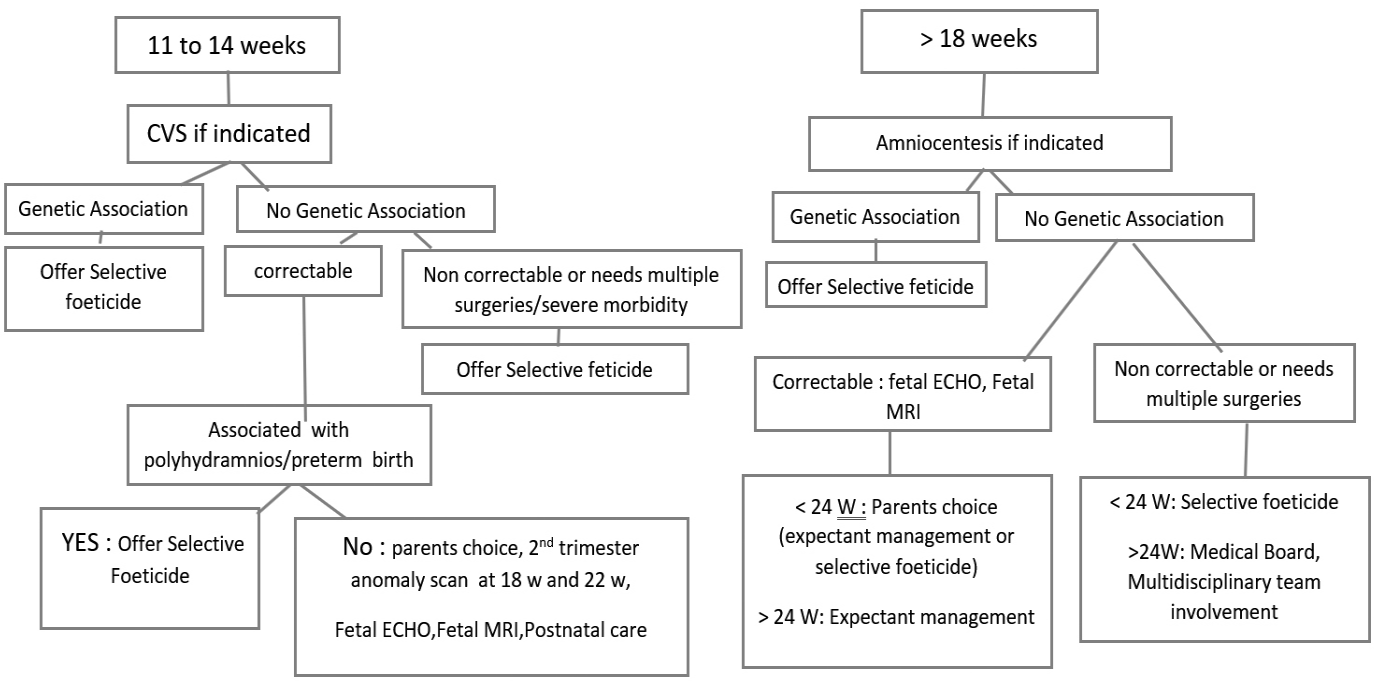
Management Protocols

The management of a discordant anomaly, entails establishing the exact chorionicity. In dichorionic pairs, selective feticide is best performed in first trimester after establishing an isolated single fetal anomaly. In monochorionic twin pairs, selective feticide is to be performed only after 15 to 16 weeks and a double amniocentesis is the preferred test for a discordant anomaly in order to rule out rare hetero-karyotypic twins. Risks and complications of invasive tests are higher in twins than singletons, however in experienced hands, the procedure-related loss is less than 1%.[1]

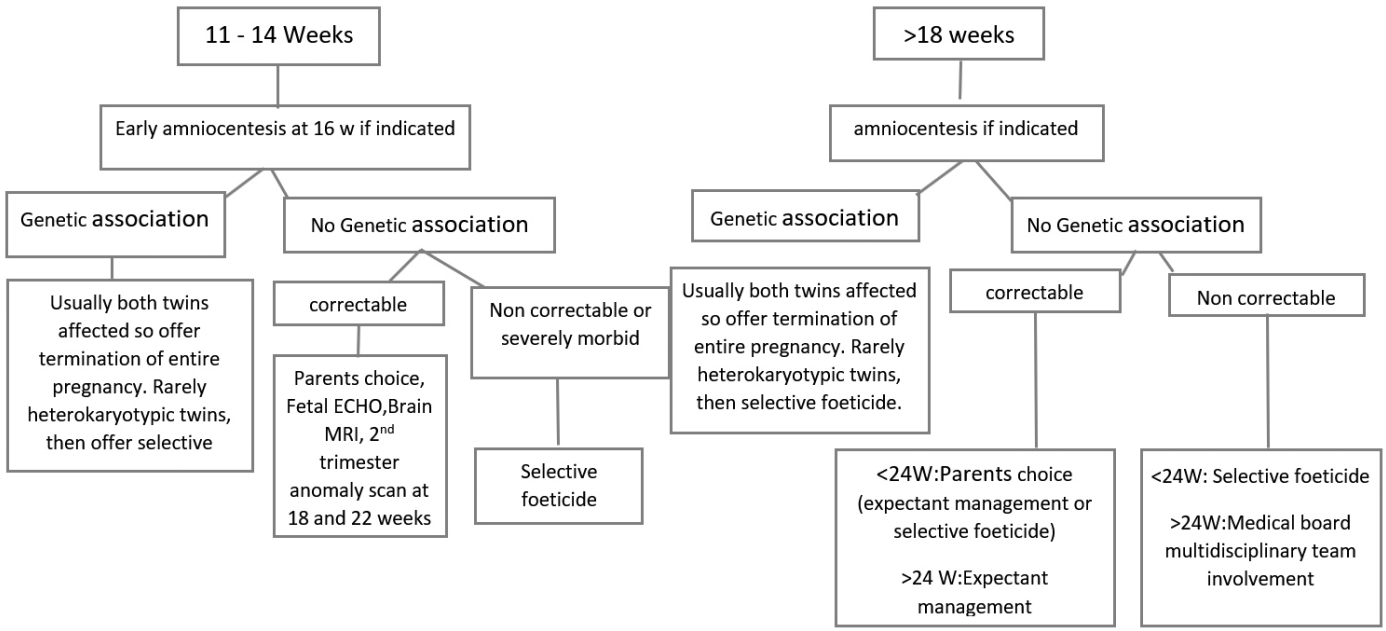
The prognosis of structural anomalies is worse in multiple pregnancies than in singletons because of the pre-existing increased risk of prematurity and low birth weight. This is of particular relevance for anomalies that need immediate postnatal intervention such as Congenital Diaphragmatic hernia. Management of the discordant fetal anomaly in twin pregnancy is challenging due to the potential threat to the healthy co-twin.[3,4,5] Management options include:

1. Expectant management
2. Termination of the entire pregnancy
3. Selective termination (ST).

Non lethal anomaly in Dichorionic twins



Non lethal anomaly in monochorionic twins



Ethical Considerations

The MTP Act 1971 with all the amendments has clearly laid down the rules for termination of pregnancy however it has not separately addressed the selective termination in twin pregnancy wherein one fetus continues to grow. To the best of our knowledge and literature search, the MTP Act forms such as Form I and C are not filled before STs in clinical practice in India due to dichotomy since the pregnancy is still on going and not terminated completely. Hence considering this matter up to 20 weeks of gestation, parents can decide for termination of the entire pregnancy in case of severe fetal non-lethal anomaly such as Tracheo -esophageal fistula however the law is silent on the matter of the rights of the unborn fetus. Parental autonomy is central in the decision-making.

Up to 24 weeks, parents may decide on selective feticide. They may refuse an intervention for the affected twin, despite high chances of correction and survival. However, this can be in conflict with the medical team's ethical responsibility towards both fetuses. Now the question arises, is it ethically explainable to terminate one fetus for a correctable condition putting a healthy twin at iatrogenic risk? This is acceptable if the anomaly is severe enough to need postnatal multiple surgeries or likely to compromise the quality of life of the affected fetus or to cause harm to unaffected twin as in anomalies associated with polyhydramnios (Neural tube defects, Trachea esophageal fistula) which can result in polyhydramnios and preterm birth, compared to anomaly such as Bilateral renal agenesis which will not hamper outcome of structurally normal co-twin.[6]

Legal References

- The supreme court bench allowed selective reduction at 22 weeks of a fetus affected by Down syndrome in June 2020 in a case of dichorionic pregnancy which was the first such case. It was argued that the diagnosis had been delayed due to the corona virus pandemic and the circulations of both fetuses were not joined hence the termination would be safe.
- A State high court allowed for selective fetal reduction in a case with sacral meningomyelocele with hydrocephalus in Dichorionic twin in March 2021. The Delhi high court on May 2021 allowed for selective termination in a case of twin pregnancy at 24 weeks period of gestation for the twin with Dandy walker malformation. The Medical board of an Apex hospital certified that the baby would have severe neuro-developmental delay and selective termination was a safe procedure.

Ethical and psychological considerations:

The reproductive choice is a matter of discussion, with different ethical and legal considerations in different countries. Obstetricians should be able to provide unbiased counseling and offer all the reproductive options which are possible under the legal gambit. Since the amendment of 2021 in the MTP Act after 24 weeks, a selective feticide decision should involve a multidisciplinary team including an obstetrician, fetal medicine specialist, geneticist, neonatologist, radiologist, and paediatric surgeon as in singletons. However, in such cases medical board team has to consider the wellbeing of the unaffected twin also in addition to the affected twin and mother.

Moral, religious, social, cultural and economic factors play major role in ethical principles guiding the women for decision making. The principles of beneficence and nonmaleficence are particularly complex when applied to the context of multifetal pregnancy. On the one hand, multifetal pregnancy reduction may maximize the woman's health and the health of her surviving neonates. On the other hand, multifetal pregnancy reduction does cause the loss of one or more fetuses and, in rare cases, may result in the loss of the entire pregnancy. Patient autonomy acknowledges a woman's right to hold views, make choices, and take actions related to her pregnancy management based on her personal values and beliefs and free of coercion.

Conclusion

Early detection and individualized management plans are essential to optimize outcomes for both fetuses in a twin pregnancy. Selective termination is a reasonable and safe option but it can result in miscarriage and preterm birth. In a discordant dichorionic pair the optimal perinatal outcomes can be obtained by selective termination of the affected twin before 18 weeks. However late procedures at 32 weeks can be a safe alternative in cases diagnosed after the 18th week of gestation.[7] Such cases should be referred to the Institutional Medical board, multidisciplinary counselling and ethical considerations under the legal gambit are often needed to support optimal outcomes.

In Monochorionic twins the discordant defects present a complex clinical challenge due to the interplay of shared placental circulation and significant risks to the healthy unaffected fetus.[8] Women may have difficulty in decision making especially with fetal reduction and should be supported emotionally along with frank discussion of the risks. The emotional as well as psychological support should last throughout the pregnancy. Multidisciplinary consultation is essential for responsible decision making.

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Problems associated with fetal reduction in late second and third trimester

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Introduction

The prevalence rate of multiple pregnancy is increasing rapidly owing to increasing ART (Artificial reproductive techniques) pregnancies, ovarian stimulation and preference of child bearing in advance maternal age. The incidence of multifetal pregnancy as reported by CDC is 32.2 per 1000 live birth. Multifetal pregnancies are associated with high risk of maternal complications like hyperemesis gravidarum, hypertension, pre-eclampsia, diabetes, IHCP, anemia, increase maternal morbidity due to increased risk of cesarean delivery, postpartum depression, iatrogenic preterm labor, and neonatal complications like, low birth weight, fetal growth restriction, increase risk of neonatal morbidity, and mortality.[1] Thus, to avoid such complications, fetal reduction is suitable proven intervention. The indications of fetal reduction includes- high-risk pregnancies with known obstetric or medical illness, genetic or structural anomalies of one fetus, uterine anomalies, and a history of preterm labor.[2]

Selective fetal reduction

Refers to specific deliberate termination of an anomalous or abnormal fetus in a multiple gestation, typically in the second trimester. It is performed to optimize outcome for the normal fetus and to prevent delivery of an abnormal fetus.

Problems with Late fetal reduction

The timing of selective reduction in twin pregnancy influences the risk of miscarriage and preterm birth. Fetal reduction in the second trimester of pregnancy carries a higher rate of miscarriage and preterm birth (7% and 14%, respectively), compared to the first trimester. One study compared cases of selective reduction in DCDA pregnancies performed between 15 and 23 weeks of gestation with those performed between 11 and 14 weeks. This study concluded that second trimester reduction of twins is associated with an increased rate of prematurity compared to late first trimester fetal reduction.[3]

Women who are diagnosed with a fetal anomaly following the second trimester scan can be given the option of a selective reduction in the third trimester, if the law permits, to reduce the risk of losing the entire pregnancy[4]. The pros and cons of each option should be considered (prematurity, fital loss rate, parental stress, availability of a fetal medicine specialist to perform the procedure in the event of preterm labour, and risk of complications associated with the specific anomaly).

Problems with expectant management

- Expectant management of a multiple gestation complicated by a single anomalous fetus leads to a 20% increase in the risk for preterm delivery, lower birth weight, and a higher caesarean delivery rate than is reported in normal twin gestations.[5]
- Expectant management of twins discordant for anencephaly is associated with an increased rate of intrauterine death of the normal co-twin in monochorionic gestations, as well as an increased rate of premature delivery, probably secondary to polyhydramnios, in both monochorionic and dichorionic gestations.[6]

Indications for late fetal reduction

- Severe Fetal Anomalies Diagnosed Late
- Selective Intrauterine Growth Restriction (sIUGR)
- Twin-to-Twin Transfusion Syndrome (TTTS)
- Risk to Maternal Health

Methods of selective reduction used in late second and third trimester

Method of selective termination depends on the chorionicity.[7]

1. **Dichorionic -** ultrasound-guided intracardiac injection of potassium chloride is the most common technique.
2. **Monochorionic-** complete ablation of the umbilical cord of the anomalous fetus is required to avoid death or neurologic injury in the normal fetus. When selective termination in a monochorionic gestation is considered, guided cord occlusion, fetoscopic cord occlusion, or laser ablation is most commonly used. Fetoscopic cord ligation may be associated with a 10% procedure failure rate and up to a 30% risk for pPROM. [21]

Late second and third trimester selective termination, what the latest research suggest?[8,9]

- Outcomes are better for late second trimester selective termination than third trimester selective termination.

- Late second and third trimester selective termination have similar rates of preterm birth.
- A cervical length of 35 mm of less at the procedure increases the risk of preterm birth.
- Reduction of the presenting twin increases the risk of preterm birth.
- Late selective termination singletons are a special population since a large duration of their pregnancy they are multifetal, with its associated increased placental-related adverse outcomes, whilst after selective termination, they continue as singletons, with an allegedly reduced risk of placental-related complications.
- The timing and rate of placental insufficiency is altered by late selective termination. Whereas the second trimester selective termination delays placental insufficiency manifestation. The third trimester selective termination does not show a similar effect.

Conclusion

The decision to undergo fetal reduction in the late trimester of pregnancy is complex, with medical, ethical, emotional, and legal considerations. It requires careful decision-making, clear communication between healthcare providers and patients, and an understanding of the potential risks and outcomes for both the mother and the fetuses involved.

Second and third trimester fetal reductions can be done under special circumstances. The goal of second and third trimester fetal reduction is to optimize outcomes for the mother and/or remaining fetus(es). Choice of technique depends on gestational age, chorionicity, placental anatomy, and clinical urgency. All procedures require expert care, ethical oversight, and thorough counselling of the family. Psychological support is critical due to the emotional and ethical weight of such decisions.

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Fetal reduction in multiple pregnancy

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Introduction

Fetal reduction is a procedure to reduce the number of fetuses in a multiple pregnancy to improve maternal and fetal outcomes, most commonly considered in cases of triple or higher order multiple pregnancies. It often becomes necessary in pregnancies resulting from ART such as IVF. It is usually performed during first or early second trimester of pregnancy and aims to reduce the risks associated with multiple pregnancies.

Considerations before fetal reduction

1. **Gestational age:** usually the procedure is done in the first trimester or early second trimester, optimally between 11 to 14 weeks. This time frame is best for two reasons: firstly, there is the increased possibility of spontaneous death of one or more embryos before 11 weeks of gestation, which may render the procedure unnecessary. Secondly, a detailed structural survey, including nuchal translucency (NT) measurement, is possible during this window, to confirm that all embryos appear anatomically normal.
2. Selection of the fetus: The choice of embryo(s) to be reduced depends on ultrasound appearance and position in the amniotic cavity. The embryo(s) most technically accessible and furthest away from the cervix should be selected for reduction or the ultrasound findings that would increase the risk of a potentially abnormal fetus including large NT, significant discrepancy in crown–rump length (CRL; smaller embryo), markers of aneuploidy (absent nasal bone, abnormal tricuspid and ductus venosus flow) or a major anatomic abnormality is selected for reduction.

When two or more fetuses are equally accessible and there is no medical benefit to reduce one over another, the physician should randomly select the fetus to be reduced, therefore eliminating physician bias or subtle discrimination in making this determination.

3. Chorionicity: for dichorionic fetuses, pharmacological agent is appropriate. For monochorionic pregnancies, vascular occlusion using radio-frequency ablation, bipolar coagulation or intra-fetal laser ablation can be employed.

Various methods employed for selective fetal reduction can be categorized as pharmacological methods and non-pharmacological methods (Table1). Pharmacological methods include KCl injection and non-pharmacological methods can be bipolar cord coagulation, radio-frequency ablation, fetoscopic and intrafetal laser ablation and suture ligation of the cord.

Table 1

Pharmacological methods[1]	Non pharmacological[2] methods
Injection Potassium chloride	Bipolar cord coagulation
	Radiofrequency ablation
	Fetoscopic laser ablation
	Intra fetal laser ablation
	Suture ligation of cord

Pharmacological methods are used in cases of di-chorionic twins or triplets

Pharmacological agents:

1. KCl

KCl injection is one of the most commonly used method for fetal reduction agent. Concentrated KCl of 2mEq/mL is injected transabdominally, under ultrasound guidance, into the thorax (fetal heart) till asystole is witnessed. Typically, a total dose of 6-10mEq is needed.[1] High potassium levels cause the heart muscle cells (myocytes) to become over-excited and depolarized, meaning they don't properly repolarize after contraction resulting in bradycardia and eventually asystole, leading to cardiac arrest. KCl can be injected into the umbilical cord also but there is risk of inadvertent injection into other fetus leading to its demise. Also, if the position of the fetus changes during the procedure, correct needle placement may become difficult. Hence, the procedure needs to be highly precise, as KCl needs to be injected intracardiac. There are significant safety concerns regarding the use of KCl like inadvertent administration into the maternal circulation leading to risk of maternal cardiac arrest. It is a highly efficacious method. KCl is reported to have a success rate of 99.5-100%.[3]

Non pharmacological method:

1. Bipolar cord coagulation

It is performed using regional anesthesia(epidural) or local anesthesia[4] under ultrasound guidance. 10 F trocar is inserted into the amniotic sac of the target fetus. The umbilical cord is grasped and occluded with 3mm bipolar forceps, and coagulation is performed for 10 to 30 s at a power setting of 30-50W, shorter durations being applied in earlier gestations and smaller cords. Cessation of blood flow is confirmed using Colour Doppler after the procedure.

Ideally umbilical cord thickness should be less than 12mm and the procedure is usually performed between 18 and 27 weeks of gestation because there is an increased risk of co-twin death at gestations earlier than 18 weeks.Tocolytic agents are given after the procedure. The survival rate of the co-twin is approximately 80%, and the risk of premature rupture of the membranes and preterm birth prior to 32 weeks is 20%. Rupture of the membranes before 34 weeks is the main complication (23.4%).[8]

Bipolar coagulation has a number of advantages. Firstly it simultaneously obliterates both the umbilical arteries and vein, causing immediate cessation of flow, thus preventing agonal interfetal haemorrhage when a vessel remains patent. Secondly, the procedure can be performed through a single port. Moreover, the technique relies on existing standard and relatively inexpensive instrumentation. It also has the theoretical advantage that the electrical current does not travel via the umbilical cord to the placenta and/or other twin, since bipolar current passes only between the two blades of the instrument.[6]

2. Radiofrequency ablation:

This procedure is an alternative to bipolar cord coagulation used for monochorionic twins and triplets reduction. It is an ultrasound guided procedure done under local anesthesia. It involves generating alternating current at very high frequencies(200-1200Hz) between the tines of the needle. As the current alternates between various directions, tissues become agitated as they attempt to align with the electrical field. Frictional heat is produced resulting in tissue coagulation and necrosis. A 17G (4.5 French) radiofrequency needle is inserted percutaneously under continuous ultrasound guidance into the intrafetal portion of the umbilical cord into fetal abdomen. Once the position is confirmed, radiofrequency energy is applied at the electrodes (tines) situated on the tip of the RFA needle to generate an average temperature of 110 Celsius in all three tines for 3 minutes. This may need to be repeated until no blood flow is seen. Advantage is that it has lower post procedural complication like PROM and lower rate of adverse perinatal outcomes.

Bioplar cord coagulation is preferred when there is enough amniotic fluid to allow for insertion of the operative sleeve and deployment of the device. Radiofrequency ablation is preferred when there is oligohydramnios or anhydramnios, in cases involving smaller fetal tissue volumes or when the umbilical cord leading to the twin to be terminated is short.[7]

3. Fetoscopic and intra-fetal laser ablation

This is a relatively newer procedure which involves ultrasound guided laser ablation of the pelvic vessels of one of the monochorionic foetuses.

An 18 G needle is inserted under local anesthesia into the fetal abdomen, adjacent to the pelvic vessels, then a 400-µm laser fibre is advanced 1–2mm beyond the tip of the needle. Laser coagulation is performed using an Nd:YAG laser at 40 W until cessation of blood flow in the iliac arteries and umbilical vein is demonstrated. Fetal heart activity continues for several minutes and fetal asystole is confirmed around 60 minutes after the procedure. The advantage of intrafetal ablation is that it can be used when a free loop of cord is not easily accessible, such as in TRAP sequence. Preterm premature rupture of membranes is the commonest postprocedural complication: its overall incidence in the literature is around 22%.[8] There is co-twin death rate of 46% within 2 weeks following the procedure, likely secondary to bleeding into the placenta of the dead fetus.

4. Suture ligation In pregnancies after 26 weeks of gestation, ultrasound-guided suture ligation has been described as an alternative procedure when the cord is too thick for bipolar diathermy cord coagulation or RFA. A single port is inserted in the amniotic cavity and the looped end of a monofilament suture is introduced using 2-mm forceps and placed under the cord. Extracorporeal knot-tying is applied using an endoloop pushing device, followed by confirmation of cessation of cord flow using colour Doppler. However, this technique is now seldom used.

Newer techniques

1. Microwave ablation:

In this procedure, a co-axial antenna emitting microwave energy is inserted into fetal abdomen close to the insertion of the umbilical cord and single microwave energy is applied. Advantage over laser ablation is that the coagulation effect is seen immediately and precise area of coagulation with minimal thermal spread, potentially reducing the risk of co-twin loss. However, it is a newer procedure used in small number of pregnancies.

2. High intensity focused ultrasound

In this procedure, a transducer is placed over the women's abdomen and targeted ultrasound energy is transmitted through the abdominal wall and uterus to cause vessel occlusion. The focused ultrasound waves cause the targeted tissue to heat up and coagulate, essentially destroying it.

Advantages include its non-invasive nature, and its

ability to target specific tissues while minimizing damage to surrounding healthy tissues,

Limitations include use in small number of cases and uncertainty of treatment effectiveness, it may exert differential therapeutic effects on fetuses of different gestational ages, positions and blood supply, making it difficult to predict its effectiveness. It requires specialized equipment and skilled operators for implementation. The treatment duration is long due to the need for point-by-point destruction of fetal tissues.

Informed consent

Nondirective patient counselling should be offered to all women with higher-order multifetal pregnancies and should include a discussion of the risks unique to multifetal pregnancy as well as the option to continue or reduce the pregnancy.

Before undertaking fetal reduction, detailed counseling of the parents regarding the procedure and its complications, fetal prognosis and available management options should be undertaken, covering the following aspects:

1. patient's health,
2. number of fetuses to be reduced,
3. risk of reduction versus no reduction,
4. potential medical, social, psychological and economic risks specific to multiple pregnancy,
5. specific adverse events and their incidence,
6. alternative options including no intervention.
7. Offer option of prenatal detection of aneuploidies, genetic disorders and structural abnormalities.

When a patient's request for information on multifetal pregnancy reduction is discordant with a physician's values, the physician should refer the patient timely for consultation. Similarly, if a woman decides against multifetal pregnancy reduction despite her physician's recommendation, the treating obstetrician should respond in a professional and ethical manner.

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Selective Fetal Growth Restriction in Twins

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Selective fetal growth restriction (sFGR) is a term applied to monochorionic gestations wherein one of the fetuses lags in growth as compared to the other. It accounts for 10-26% of all cases of monochorionic gestations.

Definition

ACOG, SMFM and ISUOG define sFGR as estimated fetal weight of the smaller twin <10th centile for gestational age and intertwin growth discordance of >20% (ACOG / SMFM) or > 25% (ISUOG).[1, 2]

The Delphi consensus defines sFGR as a case when one of the babies is extremely small (EFW < 3rd centile). In case the EFW is not <3rd centile then a combination of any three of the following four criteria can be used to define sFGR in monochorionic gestations, namely, EFW or AC < 10th centile, EFW discordance of >25th % or umbilical artery (UA) pulsatility index (PI) of > 95th centile. In case of dichorionic gestations, two of the following three criteria should be met, namely EFW < 10th centile, EFW discordance of > 25% or UA PI > 95th centile.[3]

Thus, the Delphi consensus adds the parameter of severe smallness i.e. EFW < 3rd centile and doppler interrogation of the umbilical vessels to the existing definition of sFGR suggested by professional bodies.

Whether the additional parameters contribute in identifying a subset of pregnancies at a higher risk of developing adverse perinatal outcome thus warranting additional surveillance, remains a subject of debate. A recent study by Clifton et al claims that the Delphi consensus classifies a larger percentage of pregnancies as suffering from sFGR but this subset is not at a higher risk of APO.[4]

Dating in twins:

Twin gestations in spontaneously conceived pregnancies, are conventionally dated best by the 11-13 weeks and 6 days scan based on the crown rump length of the larger twin. Beyond 14 weeks dating is based on the head circumference of the larger twin. For pregnancies conceived by ART, the date of oocyte retrieval or embryo transfer should be utilized to date the pregnancy.[1]

Mechanism of growth restriction in twin gestations:

In Diamniotic Dichorionic twin gestations the major mechanism of growth restriction is placental insufficiency in one of the placentae.

In Monochorionic gestations, it is largely attributable to unequal sharing of the placental mass, and the presence of vascular anastomosis with a smaller contribution form placental insufficiency.

Understanding anastomosis:

There are two types of vascular anastomosis found in monochorionic placentation:

1. Arteriovenous anasotomosis that permit unidirectional flow of blood resulting in net transfer of substances from one twin to the other. When small in size they cause twin anemia polycythemia sequence (TAPS). When > 2mm in diamter they contribute to the development of selective growth restriction.
2. Arterio artreial anastomosis: As the name suggests they facilitate bidirectional flow of substances owing to the lack of pressure diffrential between the two anastomosing circuits. These in fact serve to protect aganint the development of twin to twin transfusion syndrome (TTTS) and TAPS. They also compensate in part for the discordance in fetal weight accorded by unequal sharing of the placental mass. On the other hand, they predispose to sudden intrauterine fetal demise and neurological sequale in the larger twin in the vent of single fetal demise of the smaller co twin in case of the type II sFGR.

Classification of selective growth restriction:

In monochorionic gestations sFGR is classified based on the umbilical artery doppler of the smaller twin which is a reflection of the placental architecture and the type of anastomosis present, hence, also determines the perinatal outcome.

Stage 1: Fetus less than 10th centile with normal umbilical artery doppler PI. Here there are several bidirectional anastomoses (AV/VA) and few if any unidirectional anastomosis. (AA)

Stage II: Fetus less than 10th centile with persistent absent / reversed end diastolic flow (AEDF). This type has few small bidirectional anastomoses with few, small, if any AA anastomosis.

Stage III: Intermittent A-REDF: This has few if any bidirectional anastomosis but at least one large ie > 2mm AA anastomosis.

Surveillance protocols:

The first trimester scan between 11-13+6 weeks gestation serves as screen for dating, ascertainment of chorionicity, screen for aneuploidy and a limited scan for congenital anomalies. Subsequently, the frequency of surveillance is based on the chorionicity as monochorionic gestation is associated with a unique set of complications owing to unequal placental sharing and vascular anastomosis. In general, uncomplicated monochorionic twins are followed every 2 weeks from 16 weeks onwards up to birth and uncomplicated dichorionic twins are followed every 4 weeks from the mid-trimester anomaly scan onwards until birth.

Normal growth trajectory in twin gestations:

Vanlieferinghen S et al in their study comparing growth in monochorionic, dichorionic twins with singleton gestation have shown that in both dichorionic as well as monochorionic gestations there is catch up growth from 20-24 weeks which is followed by growth lag starting 26 weeks onwards when compared to the normal growth curve for singleton gestations. This growth lag is reflected In all parameters of fetal biometry, however, the maximum difference is seen for abdominal circumference and it progressively increases as gestation advances.

While the growth in dichorionic gestations is commensurate with singleton gestations prior to 26 weeks, in monochorionic gestations the normal growth curve is lower than that in singletons throughout gestation.

When selective growth restriction in DADC pregnancy is compared with singleton gestations it is seen that the gestational age at which umbilical artery doppler abnormalities appear is significantly lower in twin gestations. Also, the duration between onset of doppler abnormality and time of birth is significantly more in DADC twin gestations compared to singletons. (15 days Vs 44 days p <0.01) (5)

This has implications on clinical practice and also the counselling to be done at the onset of doppler abnormality.

Which growth charts?

Considering that the natural growth curve of twin gestations is different from singleton gestations, it is imperative to believe that twin specific growth charts shall decrease the prevalence of sFGR by about 60% or about 8 folds. However, their universal use is debatable because, twin specific charts tend to miss the contribution of placental insufficiency to fetal smallness. In addition, it should be borne in mind that DADC twins when faced with sFGR tend to have better perinatal outcomes compared to singleton gestations. Uncomplicated DADC are unlikely to experience perinatal loss of the magnitude faced by singleton fetuses. Thus, until more robust data is available use of twin specific growth charts cannot be recommended in routine clinical practice.[6]

Perinatal outcome / complications:

As per a recent meta-analysis by D'Antonio et al in which 1339 pregnancies with sFGR and 6316 pregnancies uncomplicated DADC pregnancies were included, the perinatal mortality in DADC twin gestations complicated by sFGR is > 5 folds that of those twin pregnancies not affected and the odds of adverse perinatal outcome are increased by > 3 times.[7]

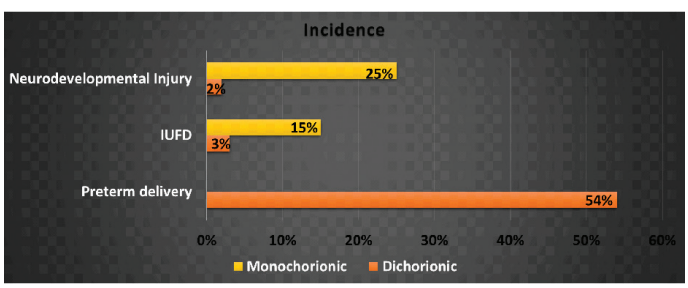
Pre-eclampsia is encountered in 19,9% of pregnancies with sFGR Vs 12.8% pregnancies without sFGR. The prevalence of intrauterine fetal demise was 2.6% Vs 0.6% in uncomplicated DADC gestations. Preterm birth both iatrogenic and spontaneous included, complicates 84.1% Vs 69.1%.

In a systematic review, stratified by gestational age at birth and the type of sFGR in monochorionic gestations, el Emrani et al found that gestational age at birth was significantly lower in sFGR Type II and III (24.6-33.8 weeks) compared to Type I sFGR (33-36 weeks). Also, in the former group perinatal mortality (0-33% Vs 0-10%) and incidence of cerebral injury (0-40% Vs 0-2%)) is higher.[8]

When stratified for the type of FGR Type I had 4% perinatal mortality, Type II 16% and Type III, 11%. More importantly, the prognosis is related to the type of sFGR at the time of initial diagnosis.

Implications of single fetal demise:

The impact of single fetal demise on the surviving co-twin depends upon the chorionicity. The incidence of neurodevelopmental compromise consequent to demise of the co twin in utero is 25% and 2% respectively in cases of monochorionic and dichorionic pregnancies. The incidence of demise of the other twin as well occurs in 15% of monochorionic and 3% of dichorionic pregnancies. Preterm delivery occurs in 54% of monochorionic conceptions. Given the risk of neurological jeopardy and intrauterine demise of the co-twin, it is important to pre-empt the time of fetal loss in the growth restricted twin and intervene at a suitable gestation. In addition, this has implications for counselling as both expectant management and fetal interventions are associated with increased risk for the pregnancy in case of monochorionic twins.



Management

The surveillance protocol for sFGR depends upon the gestational age at diagnosis and the Type of sFGR. In case of sFGR type I, since there are no significant doppler abnormalities, weekly follow up suffices. In case of type II sFGR, the discordance in placental territory and estimated weight is more pronounced. Prevalence of doppler abnormality is also greater so is iatrogenic preterm birth and perinatal compromise. Hence, in the presence of absent to reversed umbilical artery PI, biweekly ultrasound and doppler interrogation are recommended. However, in clinical practice, more frequent monitoring is offered since the patient is hospitalized and since it addresses very important considerations of parental anxiety.

In case of sFGR type III, large bidirectional arterio-arterial anastomosis, lend the pregnancy to very dynamic changes in blood flow across the placenta leading to cyclic doppler changes. The potential clinical advantage gained with the use of ultrasound / doppler evaluation in such cases remains to be proven. Yet, frequent monitoring as in cases of sFGR type II above is still offered to assist the clinician in determining the time of termination of pregnancy suitably.

One question that arises is, why should surveillance be offered in the first place when prognosis is related to the type of sFGR determined at the time of diagnosis itself. The answer lies in the study by Rustico et al. This study which longitudinally assessed monochorionic gestations, found that patterns of sFGR are liable to change over time and continued surveillance helps to customize interventions and time of birth according to these developments. Secondly, type II sFGR which is believed to incorporate both absent as well as reversed end diastolic flow, and prognosticated as a common entity, in fact, also has worse prognosis with reversed as compared to absent flow. Thus, sub categorization between the two presentations of sFGR type II can also aid management considerations.[9]

Time of birth in selective fetal growth restriction

In monochorionic twins, the time of birth is governed by the type of growth restriction and also the impact on the surviving co twin based on the risk of single fetal demise. Thus after 28 weeks, the chances of both babies surviving become higher with increasing gestation thereby favoring delivery over any intrauterine interventions.

In case of dichorionic twin gestation, studies suggest that the risk to the appropriately grown baby tend to increase after 37 completed weeks. In addition, the larger concern, of survival of the smaller twin and therefore pregnancy as a whole tend to decline 36 weeks onwards. Therefore, a reasonable bargain is delivering by 36 weeks.[10, 11]

USG markers of high risk of mortality

As is predictable, type II sFGR, severity of growth restriction, magnitude of oligohydramnios, and birth weight discordance have been found to be associated with mortality is the growth restricted twin. However, on multivariate logistic regression analysis, type II sFGR and severe oligohydramnios (defined as single deepest pocket < 1cm) have been found to be the most significant predictors of fetal demise in sFGR.[12] A recent study also cites absent a wave on DV, absence of cyclic bladder filling, and raised MCA PSV (> 1.5 MoM) to be associated adverse perinatal outcomes in sFGR.[13]

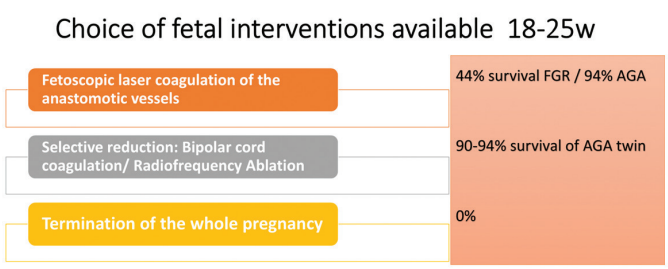
Determinants of cerebral injury in twins

The incidence of neurological compromise is higher in surviving monochorionic compared to dichorionic twins in case of single fetal demise as also with singleton gestations at comparable age at birth. The incidence is 8-33% in monochorionic gestations as per the most recent meta-analysis on the subject. The factors most significantly associated with the risk of cerebral injury include monochorionic gestation, type II/III sFGR (13.5% vs 2.5%; OR 7.69; 95% CI 2.56–25.00), single fetal demise (OR 2.92; 95% CI 0.89-9.56], larger twin (9% vs 5%; OR 1.93; 95% CI 0.95–3.92) and gestational age at birth (OR 1.56; 95% CI 1.06–2.27).[14]

The mechanism of this injury is postulated to be acute exsanguination of the larger twin attributable to large arterio-arterial anastomosis. The incidence of abnormal imaging findings in such cases is about 34%. There is a paucity of fetal MRI studies in the background of sFGR. However, neonatal imaging studies show decreased size of brain overall and decreased ratio of white to gray matter. More importantly, the reduction in size of intracranial volume is directly proportionate to the birth weight discordance of twins.

The smaller twin when it survives is likely to have neurodevelopmental compromise and lower developmental scores.[15]

Intrauterine Interventions in sFGR



The interventions that can be offered for sFGR are of two types: one, selective fetal reduction using bipolar cord coagulation or radio frequency ablation; two, fetoscopic laser photocoagulation of the anastomotic vessels (FLPAV).

While the former results in only one surviving fetus, the other gives opportunity to both to survive. The former are associated with 90-94% survival of the appropriately grown baby at the obvious cost of the growth restricted cotwin. FLPAV is associated with nearly 94% survival of the AGA baby and around 44% survival of the growth restricted baby.[16]

Outcomes following interventions:

sFGR stage 1 does not usually call for an intervention and termination of pregnancy timed appropriately can potentially salvage both babies. For sFGR type II/III, expectant management versus interventions have been compared in a meta-analysis. The gestational age at birth increases with interventions 29-32 weeks wih expectant management; 32-35 weeks with fetoscopic laser ablation and 33-37 weeks with selective reduction) The survival also increases in a similar fashion for the AGA twin (70-85% with expectant management; 70-90% with fetoscopic laser and >90% with selective reduction). However, for the FGR twin the survival is more with expectant management (40-85%) less with fetoscopic laser (30-40%) and nil with selective reduction.

The reason why fetoscopic laser improves the survival of the AGA twin is that it protects against the acute transfusion events and the exsanguination in the event of co twin demise. On the other hand, the placental discordance that was being compensated by these anastomosis gets blocked with laser ablation leading to further compromise in the availability of nutrients to the restricted co twin leading to poorer survival for this group.

The complications associated with fetoscopic laser coagulation include preterm pre-labor rupture of membranes (40%), chorio-amniotic separation (25%), unintentional septostomy (1%); loss of growth restricted twin (54%), loss of AGA twin (2%), loss of entire pregnancy (2%).[17]

Conclusion:

sFGR can be encountered in both MC as well as DC pregnancies. sFGR in DC pregnancies isa reflection of unequal placental mass. sFGR in MC pregnancies is caused by unequal placental share but clinical course is determined by the number, type and size of placental vascular anastomoses. Umbilical artery Doppler is correlated with placental vascular architecture in MC pregnancies; to classify sFGR. Cord occlusion or laser photocoagulation improve overall survival in early-onset Type II/III sFGR.

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Forthcoming Events

- **06/06/2025** -CME on Cholestasis of Pregnancy &Unseen situations in Pregnancy by FOGsd in association with AOGD & NARCHI at India Habitat Centre
- **28/06/2025** - CME on "Basics of Fetal Medicine and Genetics for Obstetrics" will be conducted by Fetal medicine & Genetics Subcommittee AOGD at Eros Hotel, Nehru Place, New Delhi
- **05/07/2025** - From Suspicion to Survival: Red flags and real-world management, will be conducted by Max Saket, New Delhi in collaboration with AOGD Oncology committee at Lalit hotel.
- **13/07/2025** - Skill Enhancing Workshop in Colposcopy and Treatment of Preinvasive lesion of Cervix will be conducted by Oncology Committee of AOGD in collaboration with ISCCP, DGF& Oncology Committee of FOGSI at Sant Parmanand Hospital, Civil Lines Delhi .
- **23/07/2025** -Webinar by Fetal Medicine & Genetics Subcommittee on TORCH Infections & Genetic disorders in Pregnancy

Management of Twin Pregnancy in Labour

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[1]Associate Prof, [2]Senior Resident
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Introduction

Twin pregnancies are associated with higher risks for both the mother and the fetus, and managing labor in such pregnancies presents distinct clinical challenges. Compared to singleton pregnancies, twin gestations are at higher risk for preterm birth, intrauterine growth restriction (IUGR), hypertensive disorders, and perinatal morbidity and mortality. These factors complicate the decision-making process regarding the optimal timing and mode of delivery.[1] Herein, we seek to contextualize evidence-based in the labor management of twin pregnancies.

Timing of Delivery

Timely delivery in twin pregnancies is vital to balance the risks of prematurity and stillbirth. Determining the ideal time to deliver twins is a balance between avoiding complications of prematurity and preventing stillbirths. Guidelines from FOGSI[2], ACOG[3] and RCOG[4] suggest the following timelines:

- Dichorionic-diamniotic (DCDA) Twins: 37+0 to 37+6 weeks
- Monochorionic-diamniotic (MCDA) Twins: 36+0 to 37+0 weeks
- Monochorionic Monoamniotic (MCMA) Twins: 32 to 34 weeks
- Conjoined Twins: Individualized plan based on anatomical findings and multidisciplinary consultation.

However, tailoring the timing of delivery must be considered according to neonatal care capacity, maternal health, and regional variations in NICU accessibility. Close fetal surveillance starting in the third trimester is vital.

Mode of Delivery in Twin Pregnancy

Determining the safest mode of delivery in twin pregnancies has long been debated. The decision typically hinges on fetal presentation, gestational age, estimated fetal weight, and the obstetrician's skill set. In the absence of contraindications, vaginal delivery has been demonstrated to be safe when Twin A is in vertex presentation. The Twin Birth Study by Barrett et al. (2013), a multicentric randomized control trial involving over 2800 women, concluded that planned vaginal delivery is not associated with increased perinatal or maternal risks when performed under appropriate conditions.[5]

Labour Induction and Augmentation:

Induction of labor, when required, follows standard obstetric protocols. Prostaglandins and Foley's catheter are both viable options for cervical ripening. Twin gestations, especially with favorable Bishop scores, respond similarly to singletons. However, nulliparity and poor cervical conditions can increase cesarean risk.[6] Adequate preparation, including blood availability and OT readiness, must be ensured prior to induction.

Generally, progress of labor is slower in both nulliparous and multiparous twin pregnancy than the singleton pregnancies.[7] In twin pregnancies, spontaneous progression of labour remains the best option, but augmentation of labour can be done with oxytocin in all women meeting criteria for oxytocin administration. Another method of augmentation includes amniotomy, which should be done only after ensuring engagement of fetal head and excluding cord presentation.

Trial of Labor After previous cesarean section:

Twins undergoing trial of labor after cesarean (TOLAC) have similar rates of successful vaginal birth and uterine rupture as singletons.[8,9] Thus, twin pregnancy with previous lower segment cesarean section and who have no contraindications for twin vaginal delivery, can be offered TOLAC with careful and continuous maternal and fetal monitoring.[9]

Dick et al in their study concluded that induction of labour in twin gestation in women with a previous cesarean delivery was associated with decreased rates of successful vaginal delivery compared to spontaneous onset of labor. However, overall Induction of Labor in these patients was generally safe as no cases of uterine rupture or adverse neonatal outcomes were found.[10]

Special consideration must be given to hospital level. Tertiary and teaching hospitals are better equipped for vaginal twin deliveries due to round-the-clock surgical support, experienced staff, and NICU availability. Peripheral centers should identify and refer eligible cases early in the third trimester.

Table1: Indications of Cesarean Delivery in Twin Pregnancy:

Indications of Elective Cesarean Section:
1. Twin A in non-vertex presentation
2. Monoamniotic Twins, including Conjoint Twins
3. Obstetric Indications. Example: Contracted Pelvis, Placenta Previa
4. Previous 2 Cesarean section
5. Higher order birth (Triplets, etc)
Indications of Emergency Cesarean delivery:
1. Fetal Distress
2. Cord Prolapse
3. Non progess of labor

Intrapartum Monitoring and Staffing

Effective labor monitoring in twin pregnancies requires continuous fetal heart rate tracing of both fetuses. This can be challenging in overburdened Indian hospitals. Use of Doppler, handheld monitors, continous CTG monitoring, prioritizing skilled birth attendants and availability of NICU can bridge the gap.

Staffing recommendations include:

- Two obstetricians (including a senior consultant)
- Two pediatric teams (or at least two neonatal care providers)
- An anesthesiologist
- Three trained nurses (mother and each baby)
- Surgical technician on standby

The operating theater should be available at all times when Twin delivery is anticipated as conversion to caesarean delivery may be needed at any moment. Thus twin pregnancy is considered a high risk pregnancy and should be referred to centers with availability of operating theater, provision of emergency cesarean delivery and availability of blood bank.

Anesthesia Considerations

Regional anesthesia, especially epidural analgesia, is strongly recommended for all twin labors. Benefits include:

- Facilitation of instrumental delivery or breech extraction
- Easier conversion to cesarean section if needed
- Improved maternal comfort and compliance

Management of Labour in Different Presentations

The presentation of both twins greatly influences the intrapartum management strategy:

1. **Vertex-Vertex:** The most favorable scenario. Vaginal delivery is usually pursued.
2. **Vertex-Breech or Vertex-Transverse:** Vaginal delivery is still possible if Twin A is delivered successfully and the obstetrician is skilled in breech extraction or internal podalic version for Twin B.
3. **Non-Vertex Twin A:** Cesarean section is typically recommended.

Vaginal delivery is generally avoided in premature twins especially if Twin B is non-vertex due to risk of head entrapment. Comprehensive ultrasound assessment near term helps predict likely presentations and delivery strategies. Ensuring informed consent and readiness for emergency cesarean is critical in all twin labors.

Management of the Second Twin

Once the first twin is delivered, the focus shifts to the second twin (Twin B), whose position and well-being must be assessed rapidly. The presentation of Twin B can change intrapartum. Assessment of lie and presentation of second twin must be done by careful abdominal palpation and vaginal examination. It is preferable to confirm the findings with an ultrasound. Second stage of labour is longer in multifetal pregnancies than singleton. Active management of the second twin delivery involves timely maneuvers to deliver Twin B and avoid complications such as prolonged inter-delivery interval, cord prolapse, or head entrapment.

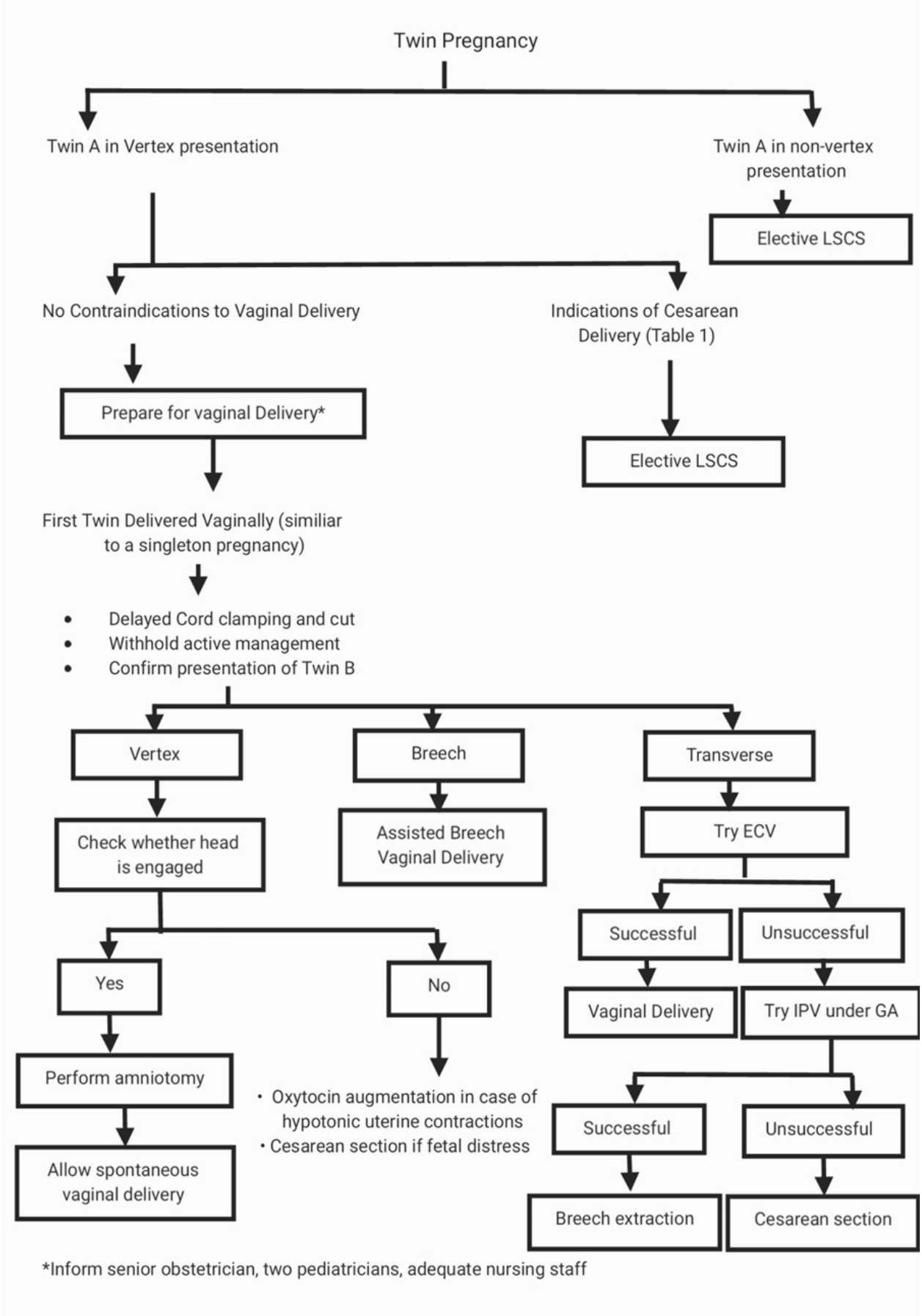
The method of delivering Twin B depends on its presentation:

1. Vertex presentation: Allow spontaneous vaginal delivery. Oxytocin may be used if contractions are inadequate. Amniotomy may be done only after the head is engaged.
2. Breech Presentation: Assess for contractions and augment with oxytocin if contractions are inadequate. Conduct assisted breech delivery as in singleton. Aftercoming head may be delivered by Burn Marshall, Mauriceau-Smellie-Veit technique or Piper forceps.
3. Transverse Presentation: The presentation is confirmed by ultrasound. External cephalic version is attempted, while monitoring fetal heart by continuous CTG. If version is successful, augment contractions with oxytocin and deliver as vertex. If external version fails, Internal podalic version is performed to convert to breech, followed by extraction. This is done in operation theatre under general anaesthesia, often supported with nitroglycerin or terbutaline.

However, very few obstetricians are trained in these maneuvers, contributing to higher cesarean rates for second twins. Incorporating simulation-based training in obstetric education and encouraging supervised exposure in teaching institutions is essential to improving competence and outcomes.

The second twin should preferably be delivered within 30 minutes of Twin A delivery, as there is an increased risk of fetal compromise and acidosis if the inter-delivery interval is prolonged than 30 minutes. This interval can however be individualised and the patient should be taken up for emergency cesarean delivery whenever fetal compromise is suspected.[11]

Flowchart 1: Intrapartum management of Twin Pregnancy in Labour



Complications and Emergency Protocols

Despite optimal management, twin deliveries are prone to complications[1]:

1. Uterine Atony: Due to uterine overdistension, twin gestations have a higher risk of atony and postpartum hemorrhage (PPH). The overall incidence of PPH in twin pregnancy is 27.8% compared to only 5.7% in singleton pregnancies.[12] Thus third stage of labor should be monitored and managed actively. Prophylactic uterotonics, uterine massage, and timely blood transfusions are crucial.
2. Malpresentations: Around 40-50% of twin pregnancies have at least one twin in non-cephalic presentation.[13]
3. Cord Prolapse: Common for Twin B, upto 1.8%, especially when unengaged . Immediate internal version or cesarean delivery should be attempted.
4. Nuchal Arm or Head Entrapment (7.3%): These complications can occur during breech extractions. Timely identification and appropriate maneuvers, such as Duhrssen incisions for head entrapment, may be necessary.
5. Combined Vaginal-Cesarean Delivery (4-5%): This undesirable outcome increases maternal morbidity.[5] It can be minimized with timely decisions and skilled second-stage management. Establishing drills, protocols, and emergency checklists can significantly reduce response time and improve patient safety in Indian obstetric units.

Conclusion

Management of twin pregnancies in labor is a delicate balance between safety and feasibility. While cesarean delivery dominates current practice, evidence strongly supports the feasibility of vaginal delivery in well-selected cases. With appropriate antenatal counseling, institutional readiness, and enhancement of clinical skills, obstetricians can safely offer vaginal delivery options to mothers carrying twins. Bridging the current training and infrastructure gaps will not only reduce unnecessary cesareans but also improve overall maternal and neonatal health outcomes across India.

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Fetal Medicine Foundation Charts for Fetal Growth in Twins

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Introduction

Twin pregnancies, which represent approximately 1.5–2% of all pregnancies, pose unique challenges in obstetric care. They are associated with higher risks of complications such as fetal growth restriction (FGR), preterm birth, pre-eclampsia, and perinatal mortality. Accurate fetal growth monitoring is critical in managing these pregnancies, especially due to the differences in growth patterns between singleton and twin fetuses. The Fetal Medicine Foundation (FMF) developed population-based weight charts for singletons, which have been widely adopted. However, applying these charts to twins can result in misclassification of normally growing fetuses as growth-restricted. To address this issue, the study by Wright et al. was aimed to derive specific reference distributions for twin pregnancies, stratified by chorionicity, using data from multiple European centers[1].

Objective

The objective of the study was to establish chorionicity-specific reference charts for estimated fetal weight (EFW) in twin pregnancies relative to singletons. The analysis sought to characterize fetal growth trajectories in dichorionic (DC) and monochorionic diamniotic (MCDA) twins and to evaluate how these patterns diverge from singleton growth, especially in the third trimester[1].

Methods

The study analyzed data from 4391 twin pregnancies resulting in two live births, comprising 3323 DC and 1068 MCDA pregnancies. Participating centers included King's College Hospital in London, Medway Maritime Hospital in Kent, Shterev Hospital in Bulgaria, and Hospital Universitario San Cecilio in Spain. The pregnancies were dated using crown–rump length (CRL) measurements from the first trimester, and EFW was calculated using Hadlock's formula[2] based on head circumference, abdominal circumference, and femur length. Data analysis employed hierarchical Gaussian models to adjust for correlations within and between twins and across serial scans. Models were fitted separately for DC and MCDA twins, using singleton percentiles as a reference[1,2].

Figure 1. Estimated fetal weight trajectories in DC and MCDA twins compared to singleton standards.

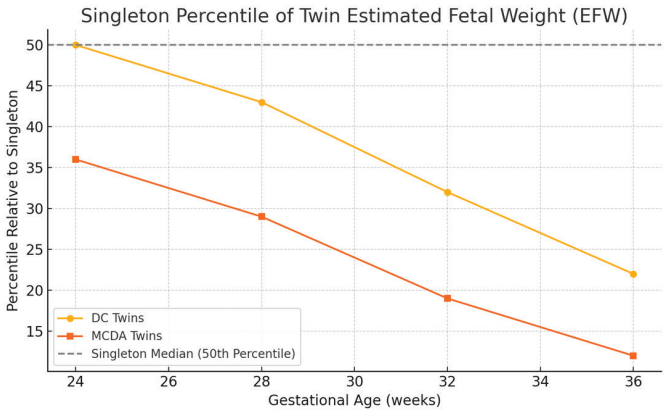


Figure 1. Line chart showing how DC and MCDA twins fall in percentile rankings relative to singletons from 24 to 36 weeks gestation.

Results

The study found that both DC and MCDA twins showed reduced growth compared with singletons. MCDA twins were smaller than DC twins throughout gestation. A transient catch-up in growth was observed until about 24 weeks, after which twin growth lagged behind that of singletons. By 36 weeks, median EFW for DC twins aligned with the 22nd percentile of singleton charts, and MCDA twins with the 12th percentile. Z-score distributions conformed well to a Gaussian model in scheduled visits, affirming the reliability of the reference distributions. The percent of twin fetuses falling below the 10th percentile of singleton standards increased markedly in late gestation, despite these being uncomplicated pregnancies.[1,3]

Table 1. Estimated fetal weight (EFW) and corresponding singleton percentile for DC and MCDA twins at various gestational ages.

Table 1: Estimated Fetal Weight (EFW) and Singleton Percentile

Gestational Age (weeks)	DC EFW (g)	DC Singleton Percentile	MCDA EFW (g)	MCDA Singleton Percentile
24	681	50	662	36
28	1211	43	1174	29
32	1908	32	1842	19
36	2647	22	2549	12

Discussion

The findings reinforce that fetal growth in twin pregnancies follows a different trajectory from that in singletons.

Factors such as shared placental resources and uterine space likely limit fetal growth, especially in MCDA twins. Using singleton charts may result in overdiagnosis of FGR and unnecessary interventions. Twin-specific charts enable better identification of pathologic versus physiologic growth restriction[1]. Compared with previous studies, the FMF twin growth model aligns well in showing early growth divergence, a brief catch-up phase, and progressive deceleration.[5, 6] Notably, five out of nine previous models reported catch-up growth in late gestation, which contrasts with the findings of the current study.[5, 6]

Clinical Implications

The implementation of chorionicity-specific twin growth charts allows clinicians to more accurately classify fetal size, reducing the risk of overdiagnosing FGR. It supports informed decisions regarding antenatal surveillance, timing of delivery, and the need for intervention. The twin charts also facilitate better comparison across twin populations and improve consistency in clinical practice.[7,8] Importantly, the use of singleton percentiles remains beneficial as a reference scale, especially for visualization and standardization[1].

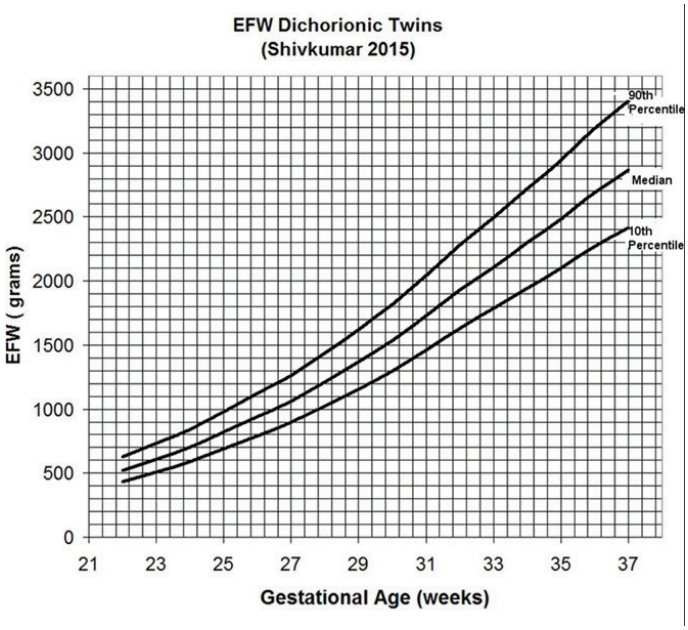
Strengths and Limitations

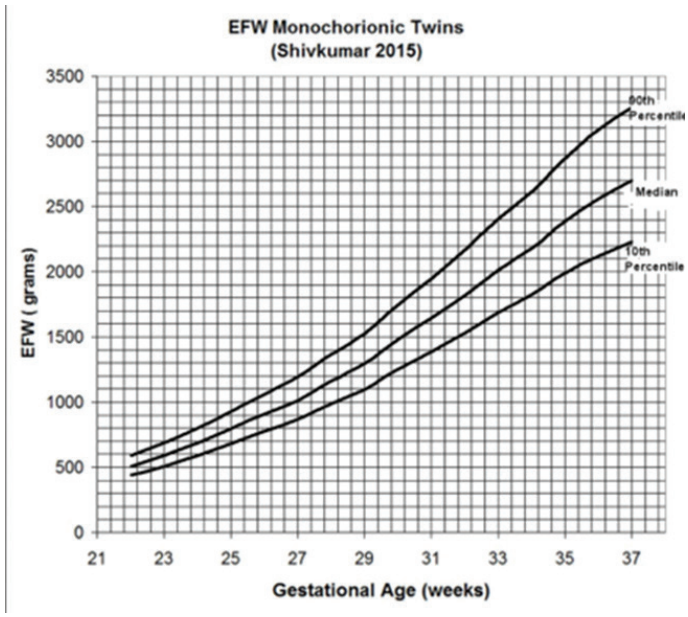
Strengths of the study include a large, multi-center dataset with standardized protocols, longitudinal data, and robust Bayesian modeling[5]. The focus on uncomplicated pregnancies for model fitting enhances the reliability of the reference charts. However, extrapolation for MCDA twins below 20 weeks introduces some uncertainty. The retrospective nature of the study and variability in the demographic composition of the population also limit generalizability to other ethnic or geographic groups[1].

EFW Charts by Shivkumar (2015)[9]

The two graphs below illustrate the **Estimated Fetal Weight (EFW)** growth curves for **monochorionic** and **dichorionic** twin pregnancies, as proposed by Shivkumar in 2015. These centile charts (10th, 50th, 90th percentiles) are critical for growth surveillance in twin pregnancies, helping differentiate between physiological smallness and growth restriction.

- **Monochorionic twins** display lower EFW across all gestational ages compared to dichorionic twins.
- **Dichorionic twins** demonstrate slightly higher median and 90th percentile weights, consistent with their relatively favorable intrauterine environment[9].





Conclusion

Fetal growth in twin pregnancies, particularly MCDA, is significantly lower than in singletons after 24 weeks. The FMF twin-specific growth charts offer a reliable and clinically applicable tool to assess fetal size and growth patterns in twins. Their integration into routine practice can enhance prenatal care and optimize outcomes by distinguishing normal twin growth physiology from pathologic growth restriction[1].

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The Latest Evidence Based Guidelines

Precision at its finest: Fetoscopic laser surgery for twin complication

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Introduction

In India, the incidence of twin pregnancies is estimated to range between 9 and 16 per 1,000 births[1]. Among these, **monochorionic twin pregnancies**—particularly *monochorionic diamniotic (MCDA)* gestations—are the most common form of monozygotic twinning. MCDA twins result from the division of a fertilized ovum between days 4 and 8 post-fertilization. They share a single placenta but are enclosed within separate amniotic sacs. In contrast, MCMA (*monochorionic monoamniotic)* twins—where both foetuses not only share the placenta but also a single amniotic sac—are much rarer, with an estimated incidence of 8 per 100,000 pregnancies. They account for approximately 1% of all twin pregnancies and 5% of monochorionic twin gestations[2].

Twin Complications

A defining characteristic of monochorionic diamniotic (MCDA) twin pregnancies is the near-universal presence of placental vascular anastomoses. These intertwin vascular connections enable direct blood exchange between the fetuses and are responsible for disrupting circulatory equilibrium. As a result, MCDA pregnancies are uniquely predisposed to a spectrum of serious complications, including Twin-to-Twin Transfusion Syndrome (TTTS), Selective Intrauterine Growth Restriction (sIUGR), and Twin Anemia–Polycythemia Sequence (TAPS).

Among these, **TTTS** is the most clinically significant complication, with the following key features:

- It affects approximately 8–15% of MCDA twin pregnancies and has a reported prevalence of 1–3 per 10,000 live births[3].
- TTTS arises due to an imbalance in the shared placental vasculature, typically involving unidirectional arteriovenous anastomoses. This results in chronic transfusion from the donor to the recipient twin, leading to hemodynamic instability and marked amniotic fluid discordance.
- Although the diamniotic structure of the gestation mitigates the risk of umbilical cord entanglement, the shared circulation remains a central pathophysiological and management challenge.

In the absence of treatment, **mid-trimester TTTS is associated with perinatal mortality rates approaching 95%**, owing to spontaneous miscarriage, extreme prematurity, or intrauterine fetal demise[4]. Given this high risk, early diagnosis and prompt, targeted intervention are critical.

The standard of care is **fetoscopic laser surgery (FLS)**, a causative and definitive therapeutic modality. The procedure involves the selective ablation of all visible intertwin vascular anastomoses on the placental surface. Conducted under sonoendoscopic guidance, the laser energy—wavelength-specific for hemoglobin absorption—allows for precise photocoagulation of pathological vessels. The primary therapeutic goal is to achieve **functional dichorionization** of the placenta, effectively halting the abnormal transfusion dynamics and stabilizing the intrauterine environment[5].

Indications

The use of laser photocoagulation at more advanced gestational ages has technical limitations of suboptimal visualization due to fetal vernix in the amniotic fluid and larger placental vessels leading to difficulty in coagulation.

Table 1: Clinical Indications for Fetoscopic Laser Photocoagulation

Twin-to-Twin Transfusion Syndrome (TTTS)	- Quintero Stage II–IV - Quintero Stage I **with**: • Cervical length < 25 mm • Maternal discomfort from polyhydramnios • Cardiac compromise in the recipient twin
TRAP (Twin Reversed Arterial Perfusion)	To ablate the abnormal placental arterio-arterial (AA) anastomoses
Selective Fetal Growth Restriction (sFGR)	- Type II or Type III sFGR
Twin Anemia-Polycythemia Sequence (TAPS)	Diagnosed based on intertwin hemoglobin discordance and MCA-PSV Doppler findings
Other indications	Amniotic band syndrome (ABS), placental chorioangiomas, lower urinary tract obstructions (LUTOs), sacrococcygeal teratomas (SCTs), and select fetal thoracic masses[7].

The standard of care for TTTS diagnosed before 28–30 weeks of gestation (preferably between **16- and 26-weeks** gestational age (GA)) is **fetoscopic laser ablation of the placental vascular anastomoses**, which targets the underlying pathophysiology more effectively than interventions such as amnioreduction or septostomy[6]. (Table 1)

Contraindications

Fetoscopic laser photocoagulation is contraindicated in the following clinical situations, where the risks of the procedure outweigh potential benefits:

1. Preterm Prelabor Rupture of Membranes (PPROM)
2. Active Preterm Labor
3. Suspected Placental Abruption
4. Chorioamniotic Membrane Separation
5. Intrauterine Demise of One Twin
6. Confirmed or Suspected Chromosomal Abnormalities or Major Congenital Anomalies8

Checklist

Following checklist can be used for Fetoscopic Laser Coagulation[7]

Operating Room Requirements

Fetoscopic laser procedures are typically performed as day-care interventions under intravenous sedation and strict asepsis.

Equipment checklist:

1. Color doppler ultrasound machine
2. Laser unit (30–40w) with foot switch
3. Disposable laser fiber (400–600 µm) with connector
4. Sterile covers for camera and ultrasound probe
5. 18G needle for uterine entry
6. Sterile sample container (for amniotic fluid if required)
7. Universal sterile draping and disinfection set
8. Surgical dressing materials

Anesthesia options:

1. Local anesthesia with 1% lignocaine ± iv sedation (e.g., midazolam)
2. Spinal or epidural anesthesia for patients requiring concurrent cervical cerclage due to short cervix8

Equipment and devices

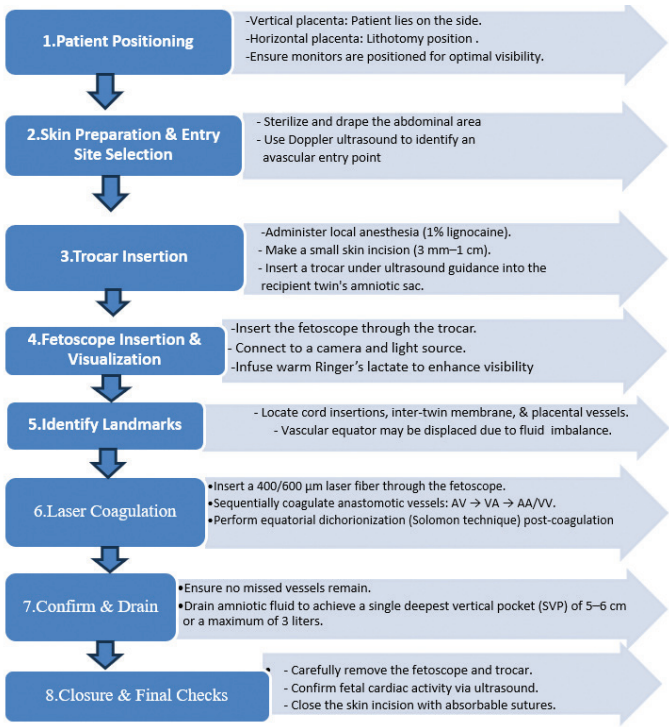
Two types of lasers are currently used for fetal laser therapy:

1. Nd:yag laser (1064 nm)
2. Diode laser (940 nm) – more commonly used due to its compact size and lower cost, and Its wavelength aligns closely with hemoglobin absorption.

Both lasers offer comparable therapeutic effectiveness[7]

FETOSCOPIC LASER PHOTOCOAGULATION PROCEDURE[9]:

The following steps are to be followed:



- Specific situations that may arise during the intervention:
- Anterior Placenta: A curved or 30° fetoscope is used, and patient positioning is adjusted to optimize visibility and access.
- Vascular Equator in Donor Sac:
  - If the anastomosis is close to the membrane, the laser can be applied directly through the membrane.
  - Alternatively, a laser fiber may be used as a guidewire to facilitate access and treatment8.

Post Operative Care

Step	Details
1. Fetal Monitoring	- Confirm fetal heart activity immediately post-procedure - Document maximum vertical pocket (MVP) of amniotic fluid for each fetus
2. Immediate Observation	- Monitor patient in recovery area for a minimum of 2 hours - Transfer to obstetric ward if stable
3. Medications	- Administer 300 µg anti-D immunoglobulin for Rh-negative, non-sensitized patients - Continue vaginal micronized progesterone until 36 weeks

4. Postoperative Ultrasound	- Perform within 24 hours of the procedure - Evaluate fetal well-being, UA/MCA/DV Dopplers - Assess for septostomy, membrane separation
5. Discharge Planning	- Discharge between 24–48 hours post-procedure if clinically stable - Advise avoidance of heavy lifting; counsel on warning signs (leaking, pain)
6. Documentation	- Provide a detailed procedural summary - Include a structured follow-up plan
7. Follow-Up Surveillance	- Weekly or biweekly ultrasound depending on clinical scenario - Monitor TTTS stage, MCA-PSV (for TAPS), and fetal growth parameters

Complications of The Procedure

Category	Details
Maternal and Procedure-Related Complications	- Abdominal pain and signs of peritoneal irritation - Intrauterine infection, including chorioamnionitis - Placental abruption - Maternal hemorrhage
Fetal Risks	- Intrauterine demise: • Single fetus: 30–40% • Both fetuses: ~12% - Cerebral injury, including: • Cystic periventricular leukomalacia • Intraventricular hemorrhage • Post-hemorrhagic ventricular dilatation • Cerebral atrophy • Arterial ischemic stroke - Neurologic morbidity at birth (~11%) - Pseudo-amniotic band syndrome (1–2%) - Rare anomalies such as aplasia cutis and bowel atresia
Other Maternal and Technical Complications	- Hematoma at the needle entry site - Chorioamniotic membrane separation at trocar insertion - Intra-amniotic bleeding due to vessel puncture - Iatrogenic septostomy, which may lead to: • Cord entanglement • Pseudo-amniotic band syndrome - Preterm prelabor rupture of membranes (PPROM) (up to 27%) - Spontaneous preterm labor (~48%) - Post-laser Twin Anemia-Polycythemia Sequence (TAPS) (2–13%) - Recurrence or persistence of TTTS after laser therapy (0–16%)[10]

Patient Communication and Support

Discuss following points with the patient before the procedure:

1. Why it's needed
2. Other options available
3. What to expect during the procedure
4. Possible risks and outcomes
5. Post-procedure care
6. Follow-up plans
7. Possible outcomes after birth

Final Remarks

In conclusion, fetoscopic laser photocoagulation represents a paradigm shift in the management of twin-to-twin transfusion syndrome, offering a targeted and evidence-based intervention that addresses the pathophysiological root of the condition. The procedure's precision, coupled with its minimally invasive nature, has led to significant improvements in perinatal survival and neurological outcomes. As expertise and technology continue to advance, FLS is poised to become the cornerstone of intervention for monochorionic twin complications. Ongoing research into optimization of technique, patient selection, and long-term follow-up will further refine its role, ensuring that clinical practice continues to align with the highest standards of fetal care.

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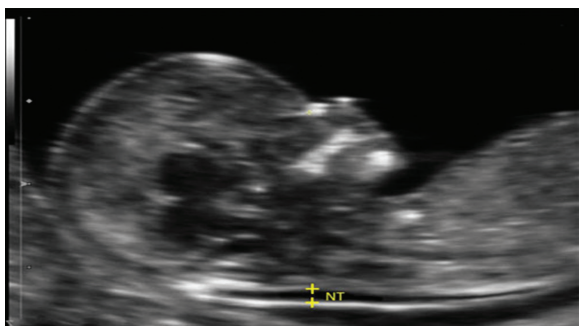
Core Concepts in First Trimester Screening — Are You Clinically Ready?

Shivangni Sinha[1], Sara Guleria[2]
[1]Assistant Prof, [2]Senior Resident, Obs and Gyn, LHMC

Let's put your knowledge to the test with key questions that highlight the clinical essentials of first trimester screening. Whether you're reviewing for exams or refining your counselling skills, this is your moment to know what you don't know.

1. **Which of the following statements regarding biomarkers is true for Down syndrome screening?**
   A) PAPP-A is high
   B) PlGF is high
   C) Alpha-fetoprotein is high
   D) Free beta-hCG is high
2. **Which is the best aneuploidy screening method for twins?**
   A) Maternal age and NT
   B) Combined first trimester screening
   C) Quadruple test
   D) Triple test
3. **What are the chances that an aneuploidy report will be positive out of the invasive tests performed (odds of being affected given a positive report — OAPR) for combined first trimester screening?**
   A) 1:10 B) 1:20
   C) 1:50 D) 1:100
4. **What is the acceptable range for fetal crown–rump length during first trimester aneuploidy screening?**
   A) 30–40 mm B) 45–84 mm
   C) 90–120 mm D) 130–150 mm
5. **Which ultrasound plane is critical for accurate nuchal translucency measurement?**
   A) Coronal B) Transverse
   C) Lateral D) Midsagittal
6. **Which fetal position can artifactually increase nuchal translucency measurement?**
   A) Hyperextended neck
   B) Neutral position
   C) Flexed neck
   D) It has no relationship with fetal position
7. **What does normal intracranial translucency signify?**
   A) Rules out spina bifida
   B) Rules out trisomy
   C) Rules out anencephaly
   D) Rules out holoprosencephaly
8. **What is the method of aneuploidy screening in triplets?**
   A) Maternal age only
   B) Maternal age and NT
   C) First trimester combined screening
   D) Invasive testing
9. **Which soft marker cannot be seen in the sagittal view of the fetus?**
   A) Nasal bone
   B) Intracranial translucency
   C) Nuchal fold
   D) Ductus venosus
10. **Non-invasive prenatal screening (NIPS/NIPT) is less reliable in cases with:**
    A) Elderly women
    B) Monochorionic twin
    C) Dichorionic twin
    D) Vanishing twin



First trimester screening hinges on timing, technique, and interpretation. Master these principles, and you provide patients with reliable, early insights—empowering informed choices and better outcomes.

Answer Key

1.D 2.B 3.B 4.B 5.D 6.A 7.A 8.B 9.C 10.D

AOGD Monthly Clinical Meeting Held on 30th May 2025

Organized by Sitaram Bhartia Institute of Science and Research

"Out of the Blue: A hidden parasite uncovered – Focus on Clinical vigilance and zoonotic prevention"

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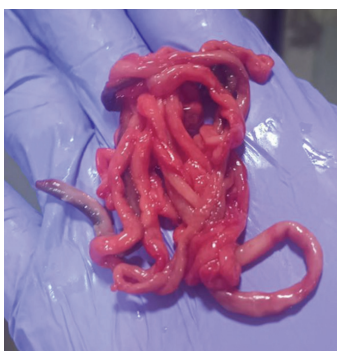
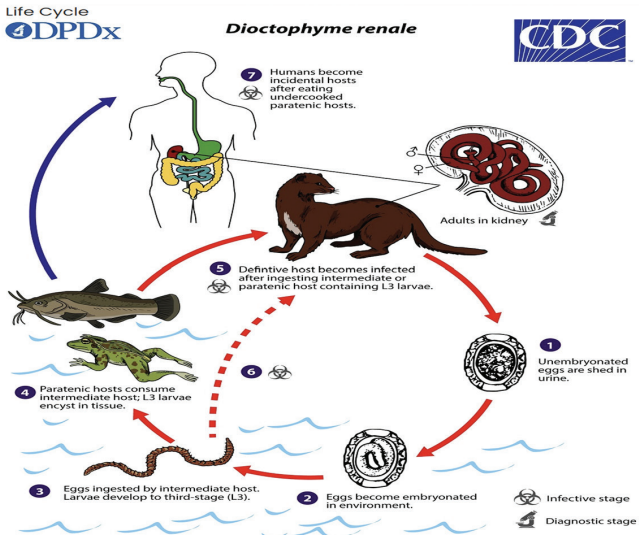
A 39year primigravida presented at 7 weeks period of gestation with complaints of severe pain abdomen. She was pale with cold extremities, tachycardia and hypotension. Abdomen was distended with guarding and rigidity. USG revealed ectopic gestation with live embryo and yolk sac in right adnexa with moderate free fluid in abdomen. She underwent emergency laparotomy. Intraoperative findings were Right tubal ruptured ectopic pregnancy with 1.5 litres hemoperitoneum. Right salpingectomy was done. Peritoneal drain was put. The drain was kept in situ beyond 24 hours as still serosanguinous fluid was draining. Thirty-six hours post-surgery patient started complaining of severe pain in abdomen around the drain site. The drain tubing seemed to be blocked due to a long cylindrical tissue-like structure. Negative suction helped to suck out the structure in drain bag. It was a 140 cm long worm like structure with tapering ends. Upon review by microbiologist, it was found to be a renal nematode - **Diochtophyme Renale**, a parasitic roundworm, specifically, that lives in the kidney. Cross section reviews confirmed presence of a coelomic cavity.



Discussion

Diochtophyme Renale is a parasitic nematode that can infect mammals, including humans. Most common manifestations are hematuria, kidney pain or enlargement, nephritis, loin pain or renal colic. Human infections are rare but have been reported in the United States, Iran, India, China, and Indonesia.



Humans can become infected after eating undercooked freshwater fishes or amphibians. Once inside the body, the larvae migrate to the kidney, typically the right kidney, where they grow into adults. Although humans may serve as definitive hosts with kidney infections, often the larvae migrate aberrantly, eventually becoming encapsulated in subcutaneous nodules and ceasing further development. Evaluation consists of urine and stool examination to check for eggs or larva. USG KUB and MRI abdomen may show (in the longitudinal and transverse section of the infected kidney) a cylindrical structure with a double-layered wall, which is externally hyperechoic and hypoechoic internally with central echoes. No definitive anthelminthic treatment is known.

In our case, urine and stool examination revealed no abnormality. USG showed linear echogenic area within the renal sinus of left kidney? worm. MRI showed small right renal simple cortical cyst only.

Due to extreme rarity of human infections, misdiagnosis, neglecting infection is very common. A study from China suggested 37 human cases known so far, mostly from China. Renal involvement was seen in 83%. Right kidney more commonly involved due to close association with the stomach. Majority were asymptomatic, most common presentation being haematuria and loin pain with a positive history of consumption of raw or undercooked fresh water fishes. Only treatment is surgical excision.

Renal nematode infections can present with a wide spectrum of symptoms ranging from asymptomatic cases to severe renal dysfunction. Early recognition is crucial. Preventive strategies include proper sanitation when handling freshwater sources, avoid consuming raw

or undercooked fish and amphibians, prevent pets from eating raw fish or amphibians, as they can act as hosts and regular veterinary check-ups for pets, especially those exposed to freshwater environments.

Unusual Malignancy In Pregnancy

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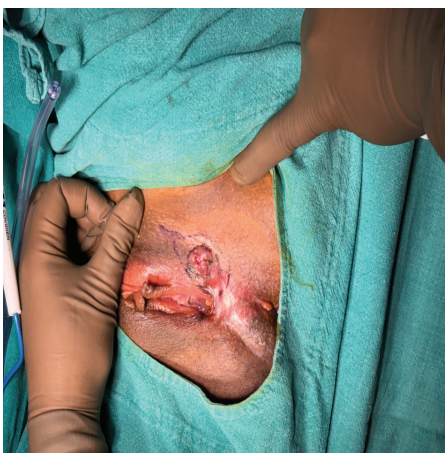
Case

A 36 year old, second gravida with history of previous normal delivery at 39 weeks gestation with child ***currently suffering from spastic cerebral palsy*** gave history of left labial growth since 7 years, which hadnever been evaluated. She complained of severe itching and increase in size of this lesion since 2 weeks. On examination, a 1.5 cm X 2 cm nodule was noted about 0.5 cm from mucocutaneous junction, in the left labiocrural fold with raised margins. It was non tenderand had rubbery consistency. Punch biopsy was takenfrom three sites near the margin of the lesion. Meanwhile pregnancy progressed uneventfully and all pregnancy related tests were normal. LBC + HPV was negative.

Biopsy was reported as Basal cell Carcinoma. Options of wait and watch versus excision and proceed were discussed. Careful evaluation was done at other sites for similar lesions. Chest X Ray **(**with abdominal shield) and MRI pelvis were normal.



Discussion

Basal cell carcinoma (BCC), the most common form of human cancer originates from stem cells within hair follicles1. Vulvar BCC (5% of vulvar cancers, <1% of all Basal cell carcinomas) is rare and is slow growing with average time to diagnosis being 13.8 months. The appearance can range from erythematous papules and patches to plaques or nodules with or without ulceration or pigmentation.

Though most commonly found on sun-exposed parts in white male population in their sixties, our patient had none of these features and her condition was concurrent with pregnancy. No previous case of vulvar BCC during pregnancy has been reported in literature Though most commonly found on sun-exposed parts in white male population in their sixties, our patient had none of these features and her condition was concurrent with pregnancy. No previous case of vulvar BCC during pregnancy has been reported in literature

NCCN stratification of low- versus high - risk BCC

Parameters	Low Risk	High Risk
Clinical	Area L < 20 mm	Area L> 20mm
Location/Size	Area M < 10mm	Area M > 10 mm
Borders	Well defined	Low defined
Primary vs Recurrent	Primary	Recurrent
Immunosuppression	No	Yes
Site of previous RT	No	Yes
Pathologic Growth pattern	Nodular, Superficial	Infiltrative, Aggressive
Perineural involvement	No	Yes

Area L consists of trunk and extremities (excluding hands, feet, nail units, pretibia, and ankles); area M consists of cheeks, forehead, scalp, neck, and pretibia; and area H consists of central face, eyelids, eyebrows, periorbital skin, nose, lips, chin, mandible, preauricular & postauricular skin/sulci, temple, ear, genitalia, hands & feet.

Our patient had a low risk tumour with excellent prognosis and rare chances of spread or recurrence. Infact, only ten patients with metastasis of vulvar BCC have ever been reported in the literature. Local recurrence rates range from 0% to 21% in different case series2. Features associated with increased risk for recurrence and metastasis include size > 5 - 20 mm, tumor thickness, extension into the subcutis, perineural invasion, aggressive histological subtype (morpheaform, infiltrative, adenocystic, basosquamous) and surgical margins < 3.0 mm.

For low-risk primary BCC, surgical excision with 4-mm clinical margins and histologic margin assessment is recommended. Our specimen was excised with 1 cm clear margin at skin and 2.5 cm at base.

We were faced with the unique dilemma of immediate versus expectant management during pregnancy of a long standing malignant lesion of vulva, the accurate assessment of spread via appropriate imaging, the risk of anesthesia and prematurity to fetus and decision regarding correct excision approach and mode of delivery.

Key points

- Inspection and evaluation of vulva in first part should be integral part of antenatal care
- Suspicious vulval lesions identified during pregnancy

should be biopsied

- Localized BCC is a common cutaneous malignancy with favourable prognosis.
- Regarding mode of delivery, if excision done in third trimester, a cesarean delivery is advocated to avoid wound dehiscence. If lesion is small and wound has healed well, vaginal delivery is an option

Birthing Positions: Alternative Choices in Labour and Delivery

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Introduction: Increasing caesarean section rate is a growing concern. Alternative birthing positions support the physiological mechanism of labour and progress and could be a game changer for reducing caesarean sections. Birthing positions are divided into sacrum non-flexible (SNF) positions (supine/lithotomy/semi-sitting) and sacrum flexible positions (SF) (kneeling/standing/lateral/squatting/all four) depending upon weight bearing over coccyx. Adoption of the position which is safe for both mother and baby, requiring least interventions with the best birthing experience is recommended by NICE (2023) guidelines. WHO (2017)also recommended to support the woman's choice of birthing position. Birth attendants should be trained for delivery in upright positions with willingness to support their choice. Biomechanics of pelvis during labour also supports the use of alternative birthing positions. Majority of women deliver in the conventional SNF positions. The major reasons found were comfort of health care providers due to their training, lack of adequate staff with overcrowded labour room, easy electronic fetal monitoring and for providing perineal protection by episiotomy or perineal support. But the studies document that the most protective method for the perineum is not to touch vulva at all during delivery. Plenty of literature supports the SF postures for second stage and delivery.

Methodology: This was a pilot study conducted from January to April 2025. 174 women underwent labour, of which 137 women (78.7%) had successful vaginal delivery. Women were divided into 2 groups according to delivery posture – SNF and SF. Both the groups were comparable in terms of age, mean BMI, epidural use and average birth weight. The mean duration of second stage of labour was significantly less in SF 37.4 minutes vs 50.4 minutes in SNF (P 0.009). Instrumental delivery and episiotomy were seen in only in SNF.Postpartum hemorrhage (p 0.308) and NICU admissions (p 0.092) were more in SNF positions but were not statistically significant.

Discussion: The alternative birthing postures are associated with various benefits. It has been seen that coccyx can move ~ 16 degrees in SF as compared to ~4 degree in SNF postures which increases the pelvic capacity. The advantages of upright postures include descent of head by gravity, less aortic compression, less fetal heart rate abnormalities, more strong and efficient uterine contractions, favourable fetal positioning, less painful uterine contractions, reduction in duration of second stage of labour, reduced chances of instrumental delivery, episiotomy and perineal trauma, lower risk of emergency cesarean section and improved neonatal outcomes. Lateral position slows down the pushing phase reducing the perineal trauma. Cochrane 2017 showed that natural tears are less traumatic, hence heal better than episiotomies. Similar results were found in our study. Our institute prepares the women for labour from antenatal period itself by teaching various exercises in the antenatal workshopsfollowed by support during labour through various exercises improving the biomechanics of labour.

Conclusion: Alternative birthing postures reduces the duration of second stage of labour, instrumental deliveries and episiotomies. Respectful maternity care should be provided to the women by allowing them to adopt birthing position of their own choice. Larger randomised studies are required.

Case Report : "More Than Just Gastritis: A Curious Case at 33 Weeks

Namrita Sandhu
Consultant, Department of Obstetrics and Gynaecology,
Sitaram Bhratia Institute of Science & Research

Case

26 years G2P1L1 at 33 weeksgestation presented with upper abdominal pain on right side with sudden onset radiation to inter scapular region & upper chest since 6-8 hours along with dyspnoea. The pain worsened on lying down and got relieved on sitting upright. She had similar episode previous evening and was managed on lines of gastritis. Patient looked visibly distressed with tachypnoea and tachycardiawith Sp02 of 98%. There was mild leucocytosis however amylase and lipase were found to be normal. Various lab parameters including Electrocardiogram, Echocardiography , ultrasound abdomen and ultrasound obstetrics were found to be normal. NT-pro BNP and D dimer was found to be normal . Chest Xray (CXR) revealed haziness in lower zone, Computer tomography (CT) of thorax suggested early pneumonitic changes. So diagnosis of atypical pneumonia was confirmed and antibiotics were stepped up and non invasiveventilation with Continuous Positive Airway Pressure (CPAP)was started. Thromboprophylaxis was given with low

molecular 40 mg once a day. A slow but consistent recovery was seen and CPAP support was gradually weaned off and patient was discharged on day 8. She went into spontaneous labour at 38 weeks and delivered vaginally(birth weight 3.5 kg).

Discussion

Pneumonia is the most common cause of fatal non-obstetrical infection during pregnancy, with a reported incidence of 0.5–1/1000 pregnancies. Pregnancy-related physiological and immunological changes make women more susceptible to severe pneumonia, including atypical pneumonia. It can occur any time during gestation, the presence of pneumonia in the third trimester is associated with worse outcomes . Atypical pneumonia refers to community-acquired pneumonia (CAP) caused by organisms other than Streptococcus pneumoniae(Mycoplasma Pneumoniae, Legionella species and Chlamydophilia pneumoniae) often with non-classical presentations. Pregnancy altered physiology can be challenging in diagnosing atypical presentation in these cases.

Key Points

Chest X-rays are often delayed in pregnancy due to fetalradiation concerns when pneumonia is suspected .

CT chest may be required if CXR findings are inconclusive.

Early recognition and appropriate treatment of pneumonia in pregnancy is essential and preventive strategies like vaccination are critical for minimizing risks.

Guidelines for submission of Competition Papers

1. Last Date for Competition Paper (Abstract & full text) Submission is 15/07/2025
2. Candidates should be less than 30 years of age.
3. Only registered delegates are entitled to submit competition paper.
4. One must be a life / annual member to submit the paper in the conference.
5. All papers should be original manuscripts and not already published and presented anywhere else.
6. Place of study and names of supervisor/ principal investigator should not be mentioned anywhere in the full text of the manuscript.
7. Students should submit a certificate forwarded by their Head of the Department.
8. Competition papers may be submitted online through the AOGD conference website www.aogd2025conference.com as two word files separately – one abstract and one full text.
9. Presenting author details – phone no. and email Id should be entered into the submission system. All further correspondence will be sent only to the contact email entered.
10. Please follow the Submission guidelines given on online registration portal.
11. Submit your manuscript in word format.
12. Text should be in lower case, black only, Font: Times New Roman, Font size: 12.

Abstract

1. Title should be concise and short.

2. Authors and Disclosures

- The names of authors should follow immediately under the title (Maximum 6 authors). Underline the presenter's name. Do not include degrees or professional designations
- Affiliation of the authors should follow in the next line.

a) Body of abstract should be upto 250 words

b) Please use the headings listed below to construct your abstract:

- Introduction: Describe the background supporting the relevance of the research question
- Objective: State the purpose of the study or investigation.
- Methods: State details on study subjects, techniques, and/or observational/analytical methods.
- Results: Include your main findings, noting statistical data.
- Conclusions: Summarize principal conclusions, emphasizing new and important aspects.

c) Do not include graphs ,tables and references in the abstract.

Full Text

1. Full text should be upto 2500 words and includes Introduction, Material and Method (includes Sample size, Study design, Methodology), Results, Discussion & Conclusion. (mention word count below title).
2. Full text should have title and only name of presenter
3. Place of study and names of supervisor/ principal investigator should not be mentioned anywhere in the full text of the manuscript, if found paper will be disqualified
4. All tables and graphs in the full text should be appropriately labeled, numbered and have a brief title.
5. References: As per the Vancouver style.
6. Use of standard abbreviations is desirable. Write uncommon abbreviations in bracket after the full word when it appears for the first time in the text.
7. Use numerals to indicate numbers, except in the beginning of sentences.
8. Use single-line vertical spacing and leave one line between paragraphs.

Please Note

- The paper will be reviewed and rated by scientific committee/ judges prior to final decision on acceptance. Their decision will be final.
- Please use the online abstract submission portal to upload this word document www.aogd2025conference.com only. Hard copies will not be accepted.
- All the information required on the online abstract/ paper submission form must be entered in various fields before uploading your word document.
- Best 7 papers will be considered for paper presentation during conference
- The remaining papers will be considered for free paper presentations
- Competition papers submitted after last date will be considered for free paper presentation (not competition)
- The decision of organizing committee will be final
- The date and time of presentation will be informed latest by 5/9/2025. Those who do not receive any information by email may write a mail to aogdlhmc2025@gmail.com

Guidelines for submission of Free Communication (Oral & E- Poster)

1. Last date for abstract submission is 31st July, 2025.
2. Only registered delegates are entitled to submit posters/papers.
3. One must be a life / annual member to submit oral/ poster in the conference.
4. Presenting author details – phone no. & email Id should be entered into the submission system. All further correspondence will be sent only to the contact email entered.
5. Students should submit a certificate forwarded by their Head of the Department.
6. Abstracts are to be submitted on the following themes:
   - High Risk Obstetrics
   - Gynaecological Oncology
   - Endoscopy
   - Reproductive Endocrinology
   - Miscellaneous
7. Theme to be selected at the time of submission.
8. All Case reports will be admitted as Poster Presentation.

Instruction for the abstract

a) Title should be concise and short.

b) The names of authors should follow immediately under the title (Maximum 6 authors). Underline the presenter's name. Do not include degrees or professional designations.

c) The names of institution, city and country should follow after the authors names, on a different line.

9. Abstract should be upto 250 words.

a) Text should be in lower case, black only, Font: Times New Roman, Font size: 11

b) Headings listed below are to be used to construct the abstract:
   - Introduction: Describe the background supporting the relevance of the research question
   - Objective: State the purpose of the study or investigation.
   - Methods: State details on study subjects, techniques, and/or observational/analytical methods.
   - Results: Include the main findings, and statistical data.
   - Conclusions: Summarize principal conclusions, emphasizing new and important aspects.

   Poster should be divided into 3 sections

   Background, Case Report , Discussion.

c) Use of standard abbreviations is desirable. The first time it appears, the abbreviations are to be written in brackets after the full word.

d) Use numerals to indicate numbers, except in the beginning of sentences.

e) Do not include graphs and references in the abstract.

f) Use single-line vertical spacing and leave one line between paragraphs.

11. Decision of scientific committee / judges will be final.

Events Held 2025

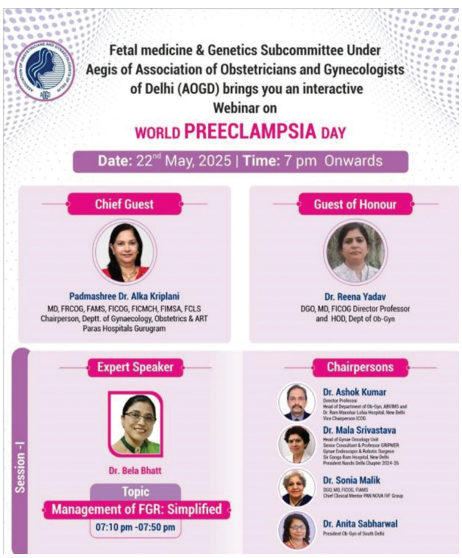
Webinar on Beta Thalassemia Awareness: A Multidisciplinary Approach to Early Detection, Prevention, and Comprehensive Care" conducted by Fetal medicine & Genetics Subcommittee AOGD on 9th May, 2025

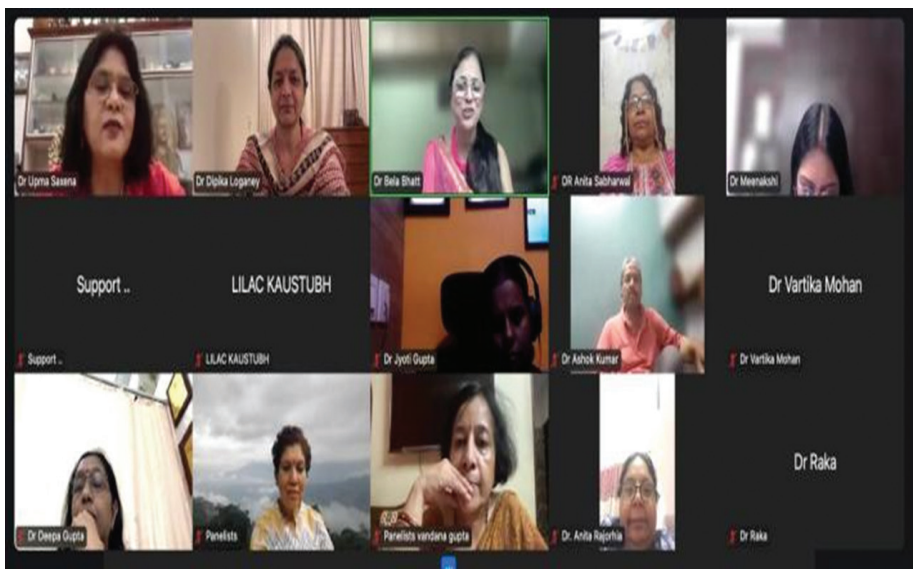
Awareness Camp on safe motherhood conducted by Community Health and Public Awareness Sub Committee on 9th May 2025 at Kondli Dispensary.

Awareness camp on Cervical Cancer screening & HPV vaccination conducted by Community Health and Public Awareness Sub Committee on 10th May 2025 at Vardaan women care centre.

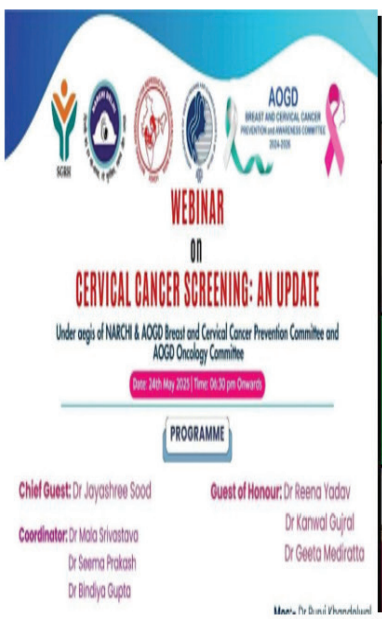
SWASTHA NARI ABHIYAAN YATRA &"CME on Breast & Cervical Cancer Awareness: A FOGSI presidential awareness program " conducted by Dept. of Obst & Gynae , LHMC & SSKH in association with AOGD on 11th May 2025 at India Habitat Centre.

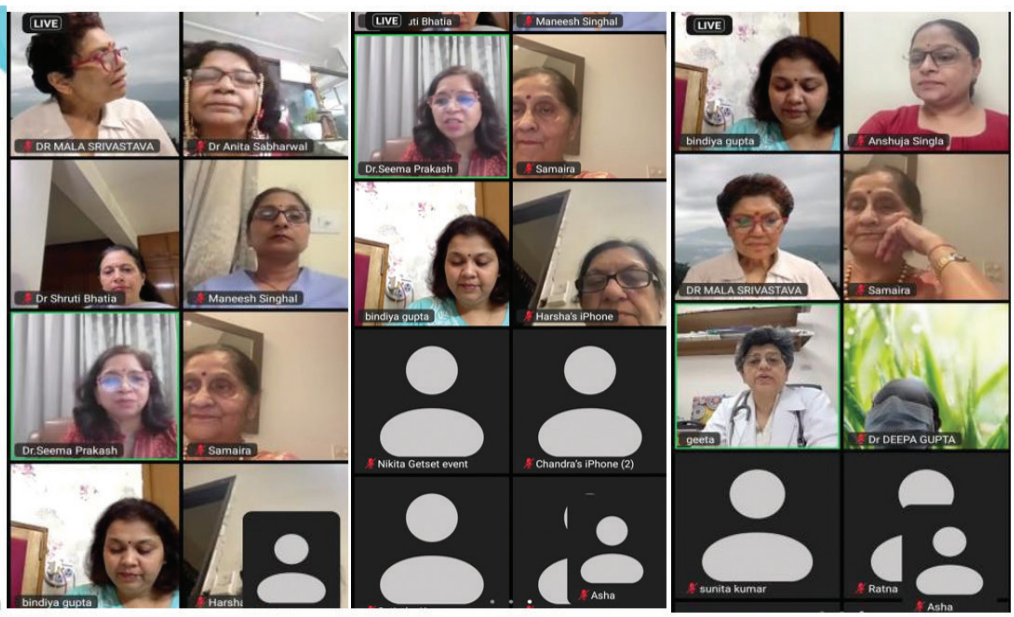
Webinar on World Preeclampsia Day conducted by Fetal Medicine & Genetic subcommittee AOGD on 22nd May 2025



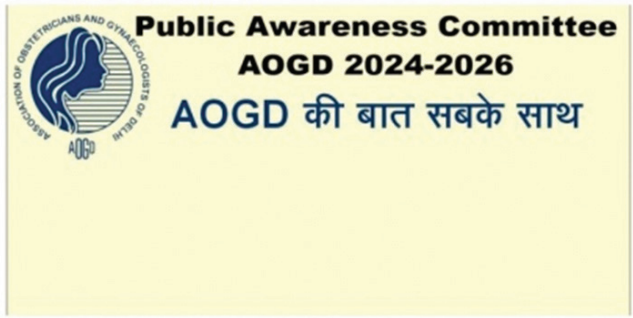


Webinar on Cervical Cancer Screening : AN Update conducted by Breast & Cervical Cancer prevention sub-committee in collaboration with Oncology sub-committee AOGD & NARCHI on 24th May 2025.





Awareness talks on the occasion of World Menstrual Hygiene day conducted by Community Health and public awareness Sub Committee AOGD on 28th & 29th May 2025 at slum area , Hospitals & Health care Centres.



AOGD Monthly Clinical meeting (virtual) conducted by the Deparment of Obst & Gynae Sitaram Bhartia Institute of Science and Research on 30th May 2025

Masterclass on Ovulation Induction & IUI : Basics to Breakthrough organised by Lady Hardinge Medical college under aegis of AOGD on 31/05/2025 at Mini Auditorium LHMC

On behalf of AOGD, Dr Prabha Lal , director professor, Dept. of Obst. & Gynae, LHMC & SSK Hospital participated as a panelist on Maternal & Child Health on the occasion of World Health Day, a special broadcast on Doordarshan on 12th April, 2025

"Dr. Neerja Bhatla former Head, Dept. of Obst. & Gynae, AIIMS, New Delhi was conferred upon the prestigious Padma Shri award by the honourable, President of India, Smt. Droupadi Murmu on 27th May 2025 at the Civil Investiture Ceremony-II at Rashtrapati Bhavan for her exemplary contributions to women's healthcare and cervical cancer prevention". It is a proud moment for the AOGD fraternity

Congratulations

AOGD 2025

47th Annual Conference of AOGD

Organized By:
Department of Obstetrics and Gynaecology
Lady Hardinge Medical College
New Delhi

13th & 14th September 2025 | Venue: Indian Habitat Centre, New Delhi

Tiny heartbeats to timeless strength - Honouring the journey of women through birth & beyond

REGISTRATION FORM

AOGD Member: ☐ Yes ☐ No **AOGD Membership No:** _____ **DMC No:** _____

Title: Prof. ☐ Dr. ☐ Mr. ☐ Ms. ☐ Mrs. ☐ **Gender :** Male ☐ Female ☐

First Name: _____ **Middle Name:** _____ **Last Name :** _____

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Telephone: _____ **Mobile No. With Country Code :** _____

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(Please use block letter only)

(All the above fields are mandatory)

CONFERENCE REGISTRATION FEES

CATEGORY	Early Bird (Till 30th June 2025)			Regular (1st July to 15th Aug 2025)			From 16th August 2025 Onwards/On-spot		
	Amount	GST 18%	Total	Amount	GST 18%	Total	Amount	GST 18%	Total
☐ AOGD Member	6000	1080	7080	6500	1170	7670	7000	1260	8260
☐ Non-Member	7000	1260	8260	7500	1350	8850	8000	1440	9440
☐ PG Students	5000	900	5900	5500	990	6490	6000	1080	7080
☐ AOGD Member (above 75yrs)	Complimentary (Kindly email duly filled Registration Form along with age proof on our offcial email id mentioned below)								

Pre-Conference Workshop - 11th - 12th September 2025

Early Bird (Till 30th June 2025)			Regular (1st July to 15th Aug 2025)			FROM 16TH AUGUST 2025 ONWARDS/ON-SPOT		
Amount	GST 18%	Total	Amount	GST 18%	Total	Amount	GST 18%	Total
1500	270	1770	1800	324	2124	2000	360	2360

Opting For: 11th ☐ 12th ☐ Both Days ☐

Pre-Conference - 11th September 2025 (Tick your choice of workshop)

Name of Workshop	Time	Venue
☐ Mastering POP Surgery: Techniques, Complications, and Comprehensive Management	9:00 Am - 2:00 PM	Auditorium, Sant Parmanand Hospital, Civil lines, Delhi
☐ Laparoscopy and beyond: A hands on workshop	Laparoscopy and be	Skill centre, Sir Gangaram Hospital
☐ From Imaging to Incision: Advancing Precision in Gynae-Oncologic Surgery	9:00 AM - 2:00 PM	AIIMS, New Delhi
☐ Preventive Oncology	10:00 AM - 4:00 PM	Library Hall UCMS & GTB Hospital Delhi
☐ From Prescription to Prosecution: How Doctors Can Prepare for Legal Complaints in Clinical Practice	1:00 PM - 5:00 PM	Cloudnine Hospital, Vikas Puri
☐ Maternal Hope: Ending Preventable Losses, Saving Lives	10:00 AM - 4:00 PM	Northern Railway hospital auditorium, Connaught Place.
☐ Menopause prescription: Hormones and more, Master the art	9:00 AM - 2:00 PM	Mini Auditorium, LHMC

Pre-Conference - 12th September 2025 (Tick your choice of workshop)

Name of Workshop	Time	Venue
☐ Teens Timelines &Trust : Demystifying Amenorrhea and Contraception	9:30 AM - 1:00 PM	Kailash Deepak Hospital , Vikas Marg Delhi -110091
☐ ENDOMETRIOSIS DECODED What the text books don't tell.	1:00 PM- 5:00 PM	AIIMS, New Delhi
☐ VAX TALK .... Adults Too Need Vaccines	1:00 PM – 5:00 PM	Sir Gangaram Hospital Auditorium
☐ Bump to Birth: Foundations of Fetal Health &Genetics	10:00 AM - 5:00PM	Old LT, Behind OPD Block, VMMC & Safdarjung Hospital, New Delhi – 110029
☐ Bringing quality control into managing PCOS	1:00 PM - 5:00 PM	Max hospital, Saket
☐ Controversies in Reproductive Medicine: Case-Based Challenges in Infertility and IVF	9:00 AM - 4:00 PM	Mini Auditorium,LHMC
☐ Postpartum Haemorrhage: Prevention & Cure- Learn The Art	2:00PM - 5:00PM	Auditorium, ABVIMS and Dr RML hospital

Note:

- The above-mentioned fees are applicable per workshop. If a participant wishes to attend 2 workshops, the fee will be charged separately for each.
- Post graduates to attach a certificate from HOD and also should be a member of the AOGD in order to attend and present a paper.
- Membership number is mandatory for registration in membership category. For any queries related to membership, you may contact Ms. Sarita (+91 92116 56757).
- For spot registration: payment will be accepted only by mode of Cash/Card/UPI.
- The disbursal of Delegate kit for the same will be subject to availability Delegate kit would be handed over only to registered delegate.
- Registration is non transferable. Post conference, no kit or any workshop material will be disbursed to the Delegate/associate Delegate/PG student.

FOR OFFLINE PAYMENT

For Cheque/DD Payment: Please issue the cheque in favor of "ASSOCIATION OF OBSTETRICIANS AND GYNAECOLOGISTS OF DELHI"
Submit to: Ms. Sarita (+91 9211656757)
Dept. of OBGYN
Lady Hardinge Medical College & Hospitals
New Delhi – 110001

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Account Name: SEM Account **Account No:** 143611010000011 **Bank:** Union Bank

Branch: Indirapuram, Ghaziabad **IFSC Code:** UBIN0814369 **MICR Code:** UBININBBGHZ

Mode of Payment: Cash ☐ Card (Credit/Debit) ☐ Demand Draft ☐ Cheque ☐ NEFT ☐ Online ☐

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Drawn on (Name of the Bank): _____ **Branch:** _____ **Amount:** _____

Cancellation & Refund Policy

1. All cancellation should be made in writing and sent to AOGD secretariat.
2. All cancellation received on or before 15th July 2025 will be entitled for 75% refund of the amount paid.
3. All cancellation received between 16th July 2025 to 14th August 2025 will be entitled for only 25% of the amount paid.
4. No refund for cancellation made on or after 15th August 2025.
5. The refund process will begin only 30 days after the completion of the conference

NOTE: The organizing committee shall not be held liable for any delay or cancellation of the AOGD 2025 conference due to events beyond its control, including natural disasters, terrorism, war, or labor disputes.

AOGD Office

Secretariat Address
AOGD, Department of Obstetric and Gynaecology, Lady Hardinge Medical College & Associated Hospitals, NEW DELHI- 110001
Email: aogdlhmc2025@gmail.com
Telephone: 011-23404419
Mobile: 9717392924

Conference Manager

Sem Events & Meetings OPC Pvt. Ltd.
59-60, A2, Shiv Arcade, Acharya Niketan, Mayur Vihar Phase 1 New Delhi, India
M: +91 81714 92255 | 93544 81701
Email: info@aogd2025conference.com

Association of Obstetricians & Gynaecologists of Delhi

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Surname: .....

Qualification (year): .....

Postal Address: .....

City:..... **State:** ..... **Pin code:** .....

PHOTO

Place of Working: .....

Residence Ph. No. ..... **Clinical / Hospital Ph. No.** .....

Mobile No:..... **Email:** .....

Gender: Male:..... **Female:**.....

Date of Birth: Date.....**Month** ..... **Year**.....

Member of Any Society:.....

Proposed by .....

Cheque/DD / No: .....

Cheque/Demand Draft should be drawn in favour of**: Association of Obstetricians and Gynaecologists of Delhi**

FOR ONLINE TRANSFER THROUGH NEFT/RTGS

Name of Account: Association of Obstetricians and Gynaecologists of Delhi
Account no: 5786412323
Name of Bank: Central Bank of India
Branch: LHMC & SSK Hospital
IFSC code: CBIN0283462
MICR code: 110016067

ASSOCIATION OF OBSTETR

12418708@cbin

BHIM UPI

For Life Membership	: Rs. 11,000 + Rs. 1,980 (18% GST applicable) = Rs. 12,980
For New Annual Membership*	: Rs. 2,000 + Rs. 360 (18% GST applicable) = Rs. 2,360
For Old Renewal Membership+	: Rs. 1,200 + Rs. 216 (18% GST applicable) = Rs. 1,416

Encl.: Attach Two Photocopies of All Degrees, DMC Certificate and Two Photographs (Self attested)

*** Annual Membership is for the calendar year January to December.**

*** In case of renewal, mention old membership number.**

Note: 18% GST will be applicable as FOGSI requires it.

Send Complete Membership Form Along With Cheque / DD and Photocopy of required documents to the secretariat.
For online transaction send scan copy of all documents with payment slip on given mail id

Secretariat
Department of Obstetrics and Gynaecology
Lady Hardinge Medical College & SSK Hospital, New Delhi-110001
Tel.: 011-23408297, (M): 9717392924 | Email Id: aogdlhmc2025@gmail.com

68th All India Congress of Obstetrics & Gynaecology

aicog Delhi 2026

Advocate Innovate Challenge Optimise Globalise

Ek Rashtra - Ek Mission

Swastha Naari - Samruddha Vatan

Har Ghar FOGSIAN

Conference Theme

68th AICOG 2026 DELHI

All India Congress of Obstetrics & Gynaecology

Inspire, Include, Invent: Improving Women's Health in India

All India Congress of Obstetrics & Gynaecology

14-18 January, 2026
Yashobhoomi, Dwarka | New Delhi
(India International Convention & Expo Centre)

Abstract Submission is Now Open

Abstract Themes

1. Maternal & Child Health
2. Minimal Invasive Gynaecological Surgery
3. Population Stabilization
4. Sexual & Reproductive Health
5. Gynaecologic Oncology
6. Midlife & Geriatric Gynaecology
7. Innovation in OBGYN
8. Miscellaneous

Last Date of Submission
15th October

Scan QR Code For More Information

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