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THEME: PREVENTING STILLBIRTHS

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Stillbirths: losses that should count

Globally, a stillbirth occurs every sixteen seconds. 83% of these are concentrated in two regions of the world. Sub-Saharan Africa and South Asia, and as a nation, India is the largest contributor to the global burden of stillbirths. The stillbirth rates are highest amongst the most vulnerable and impoverished communities. And yet, amongst the affluent, the risk of stillbirths has not been reduced to a near zero despite extensive monitoring and resources to prevent these.

Knowledge of causes and feasible solutions for prevention is key to health professionals' priorities, to which this special bulletin on Stillbirths is dedicated. Also, the chapters on unexplained stillbirths and genetic causes of stillbirths aim to take us beyond the realm of preventable stillbirths.

We would like to thank our contributors: Dr. YM Mala, Dr. Shakun Tyagi & Dr. Priyank Singh Dasil; Dr. Chanchal and Dr. Ratna Puri; Dr. Nidhi Khera and Dr. Jharna Behura; Dr. Rinku Sengupta & Dr. Gaurika Gupta; and finally Dr. Nidhish Sharma, Dr. Asmita and Dr. Nandita Dimri.

Sincerely,

The editorial team

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Warm greetings to everyone!!!!!

It is our pleasure to wish everyone a very happy and healthy New Year 2025. With great enthusiasm we embark into new year with new energy and plans.

The theme of this bulletin is a "**PREVENTING STILL BIRTHS**". The pregnancy is a most valuable and a memorable journey for a mother. If it ends in a still birth – it shatters the hopes and dreams of not only the mother but the entire family. We should strive and work hard to provide each mother a healthy baby and have a safe landing at the end of a pregnancy.

As we take on the responsibility of any pregnant mothers, we should be aware of the global **Still Births** rates and causes of the perinatal mortality and their morbidity as well. There is always a dilemma when to deliver an uncomplicated and low risk pregnancy. The monitoring of the fetal growth restricted pregnancy and the optimal delivery time has to be carefully guided by our fetal medicine specialists.

The bulletin also deals with the steps to investigate a case of Still Births. Both the clinical perspective as well as the genetic perspective of all cases of Still Birth has been discussed in detail. The risk factor of unexplained **Still Births** cases is dealt with intelligently and comprehensively. Together with the clinical aspect the knowledge about the medicolegal issues of the **Still Birth** is necessary. At the end of the day, all of us should know how to deal with the Irate relatives of the mother. We are really very lucky to have eminent clinicians and experienced academicians participating into making of this exclusive bulletin. Our editorial team has really worked hard in conceptualising the subjects and collecting real gems and a valuable bouquet of contents for this bulletin.

Hope this bulletin adds knowledge and exclusive information pertaining to all the areas of **Still Births**. We shall be really happy if it enriches our members academically and benefits them in their day to day clinical practice.

"Long live NARCHI Delhi Chapter"

MESSAGE FROM DR. NUZHAT AZIZ

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Warm greetings to each one of you!

I would like to congratulate NARCHI Delhi for dedication its bulletin on the topic of preventing stillbirths, which is the need of the hour, as we try to reach our target of less than 10 stillbirth rate by year 2030.

Stillbirth is one of the worst tragedies where death replaces the dreams of life. A woman's hopes of a happy future with her baby are shattered and she is no longer the same person. Preventable is word used for an event that could have been avoided. This high prevalence of preventable stillbirths is a reflection that we, as a society have not realised the importance of saving a newborn's life. Stillbirth rates across the world varies from 2 per 1000 in Japan, Singapore to many times higher of 12/1000 in India. This disparity reflects the efforts of a country, its people, that includes every individual to improve the healthcare system, to improve healthcare delivery, to provide equitable care. A huge responsibility rests on each one of us; the obstetric care providers, to ensure that a pregnant woman gets every intervention that is known to prevent stillbirths – the safer baby bundle care. To count every stillbirth, introspect and review, report it. It is our responsibility to standardise our institutions to ensure they are capable of dealing with fetal emergencies through the day and night. And mandate that all of us are certified to monitor the fetus in antenatal and intrapartum periods; certified with fetal growth assessment skills, intermittent auscultation and cardiotocography interpretation. Let's all get together to certify our care - be it a clinic, small or big hospital, primary or tertiary care – and create safer baby centres of excellence. We hope that this bulletin helps.

Best wishes

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Global Trends in Stillbirths & What is Causing Them

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How is a Stillbirth Defined?

A still birth is defined by the World Health Organization as the birth of a fetus with no signs of life at or beyond 28 weeks of gestation. And still birth rate (SBR) is defined as the number of babies born with no signs of life at or beyond 28 weeks, per 1,000 total births, where total births are calculated as a sum of live and still births. A universally accepted lower limit for gestational age at still birth however does not exist. Most countries use the limit 28 weeks in accordance with the WHO definition, some use 24 weeks and a few use a limit of 22 weeks to define still births. The 22 week limit is as per the International Classification of Diseases- Version 11. The US Centres for Disease uses 20 weeks as the cut-off for defining still births. For international comparison, the WHO proposes a gestational limit of >=28 weeks or if missing, a birth weight of >=1000gm or if missing, a body length of >=35cm. Still birth rates are a direct indicator of a country's quality of health care programme and women's access to it.

What is the Global Burden of Stillbirths?

A 2021 WHO report, estimates 1.9 million babies to have been stillborn at or beyond 28 weeks gestation, amounting to a global stillbirth rate of 13.9 stillbirths per 1,000 total births. This figure does not capture the losses between 20-28 weeks of gestation. When including stillbirths at or beyond 20 weeks, absolute estimate for still births reaches 3.0 million babies and the still birth rate swells to 23.0 per thousand total births. Which means that by using the 28 weeks cut-off we may be undercounting actual losses by a third.

These losses, however, are not experienced uniformly across countries. The burden of stillbirths is highest in sub-Saharan Africa and Southern Asia, with these two regions accounting for three quarters of all stillbirths. In sub-Saharan Africa, the stillbirth rate of 21.0 per 1,000 total births is seven times higher than the lowest regional rate of 2.9 found in the Europe, Northern America, Australia and New Zealand regions.

Stillbirths are concentrated in a few countries, with the greatest numbers found in India, followed by Pakistan, Nigeria, the Democratic Republic of the Congo, Ethiopia and Bangladesh. These six countries accounted for almost half of the estimated global number of stillbirths and 36 per cent of global live births in 2021.

Where does India Stand with Respect to Stillbirths Globally?

Because it is host to more than a seventh of the world's population, India contributes the highest absolute number of stillbirths in the world. Lack of a standardized definition to identify and systems to classify stillbirths makes it difficult to arrive upon a true actual figure for India. With this limitation, and using certain statistical estimates the GBD collaborators have estimated still birth rate in India to be 24·7 (20·4–30·3) per thousand total births beyond twenty weeks gestation[iii]. The corresponding figure for >=28 weeks in 2021 was 17.4 (14.4–21.3) per thousand total births. This leads to an absolute figure of 286,482 stillbirths or 15% of the world's total number. India's figure of 17.4/1000 remains higher than the global average of 13.9/1000 for the year 2021 but is better than low income countries of sub-Saharan Africa and south east Asia. By way of comparison, stillbirths rates in 2021 ranged from 1.6 per 1,000 births in Japan to 31.2 in Guinea-Bissau, a country in western Africa.

These figures can vary across states as access to health care, maternal education and other socioeconomic factors differs across states. Districts of Odisha, Madhya Pradesh, Rajasthan and Chhattisgarh (OMRC) form a contiguous east-west belt of high SBR. Additionally, higher still births are reported from rural India than in urban India.

Global Trends in Stillbirth Rates

Over the past two decades, substantial progress has been made in reducing the stillbirth rate globally, which declined from 21.3 stillbirth per 1,000 total births in 2000 to 13.9 in 2021 – a 35 per cent reduction. Similarly, the total number of stillbirths also decreased by 35 per cent, from 2.9 million to 1.9. million. However, these reductions have not kept pace with other indicators such as under-five mortality.

Compared to the annual rates of reduction (ARR) for other mortality indicators, the gains made in stillbirths have been much slower, with progress lagging behind across all regions since 2000. The ARR 2000-2021 in mortality for children aged 1–59 months, for example, was double the ARR in stillbirths for the same period (4.0 per cent to 2.0 per cent, respectively).

What is Causing Them?

Still births are classified as intrapartum still-births: those occurring after the onset of labour; and antepartum still births: those occurring before the onset of labour. Over 40% of all stillbirths are intra-partum – a loss that can be avoided with improved quality and respectful care during childbirth including routine monitoring and timely access to emergency obstetric care when required.

The etiology of still births can be broadly categorized as maternal, fetal, placental, cord, and unknown. Specifically, these etiologies have been listed into seventeen primary diagnoses by the Stockholm Classification of Still Births Group. These specific etiologies are shown in Table 1.

Table 1: Causes of Still Birth according to Stockholm Stillbirth Classification

Cause of stillbirth
Malformations and chromosomal abnormalities
Infection
Immunization
Feto-maternal transfusion
Twin-to-twin transfusion syndrome
Birth asphyxia
Intrauterine growth restriction/placental insufficiency
Umbilical cord complication
Placental abruptio
Preeclampsia
Diabetes mellitus
Intrahepatic cholestasis of pregnancy
Uterine complication
Coagulation disorders
Other causes related to stillbirth
Unknown
Unexplained

The distribution of these specific etiologies can vary depending upon the country and the region they are studied in and are a reflection on the quality of healthcare services available and the extent of investigations performed to investigate a still birth. Intrapartum asphyxia is a leading cause of stillbirths in low- and middle-income countries but may not constitute more than 2% of still births in developed countries. Working on 382 stillbirths from 22 completed weeks in Stockholm, Sweden, the distribution of these seventeen diagnoses are shown in Figure 1. The most common conditions identified were intrauterine growth restriction/ placental insufficiency (23%), infection (19%), malformations/ chromosomal abnormalities (12%). The 'unexplained' group together with the 'unknown' group comprised 18%.

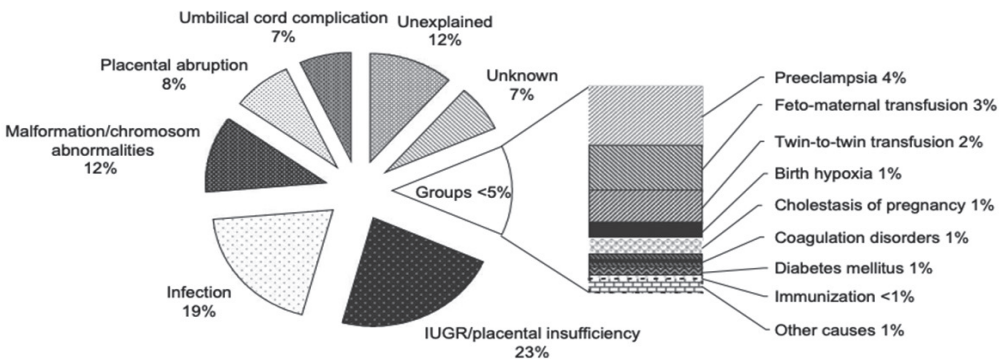

Figure 1: Distribution of primary diagnoses related to Still Births in the Stockholm Stillbirths study. 2008

The share of intrapartum stillbirths in India as estimated by a meta-analysis of 41 studies is one-thirds of all still births. This proportion appears to be marginally lower than the global proportion of 40-45%. Whether the discrepancy stems from better recognition of intrapartum emergency and access to emergency services or its simply a lack of proper classification system is unknown. Causes leading to still births in India are maternal (25%), fetal (14%), placental (13%), congenital malformations (6%) and intrapartum complications (4%). Approximately 20% of stillbirths in this meta-analysis were assigned as unknown or unexplained[vii].

The WHO Classification of Stillbirths

Recognizing the need to standardize reporting of stillbirths globally and the need to identify perinatal mortality as per their timing: i.e. whether antepartum (A) intrapartum (I) or Neonatal (N), and to classify causes under these timing heads as maternal or fetal, the WHO recommends **the International Classification of Diseases for Perinatal Mortality (ICD-PM) or the** ICD-10-PM system. (Table 2). ICD-PM groups the main condition in the fetus or infant into a limited number of categories of cause of death under the three headings for timing of death (i.e. A, I or N). There are six groups of antepartum causes of death, designated by a leading "A"; seven groups of intrapartum causes of death, designated by a leading "I"; and 11 groups of neonatal causes of death, designated by a leading "N". The five existing ICD-10 groups of maternal conditions in perinatal death have been rearranged into four groups denoted with a leading "M" as follows: M1 – the complications of placenta, cord and membranes; M2 – maternal complications of pregnancy; M3 – complications related to labour and delivery; and M4 – the medical and surgical conditions which may or may not be related to the present pregnancy (e.g. pre-eclampsia or preexisting hypertension). A fifth group has also been added: when no maternal condition that might have been on the causal pathway for the perinatal death was identified at the time of presentation of the perinatal death, it must be coded as M5 – "no maternal condition". The list of the main maternal ICD-10 conditions included in each of the ICD-PM maternal condition groups is as per Table 3. All of the ICD-10 codes that can be assigned to the perinatal cause of death on a death certificate are represented in these new groupings. The ICD-10 codes have been reordered and clarified to better represent the pathologies at different times of perinatal death.

Table 2: ICD-PM 10 tabulation for perinatal cause of death and maternal condition separated by timing of death

Maternal condition	M1: Complications of placenta, cord and membranes	M2: Maternal complications of pregnancy	M3: Other complications of labour and delivery	M4: Maternal medical and surgical conditions	M5: No maternal condition identified	Other	Total (%)
Perinatal cause of death							
Antepartum death (A)							
A1: Congenital malformations, deformations and chromosomal abnormalities							
A2: Infection							
A3: Antepartum hypoxia							
A4: Other specified antepartum disorder							
A5: Disorders related to fetal growth							
A6: Fetal death of unspecified cause							
Total (%)							
Intrapartum death (1)							
11: Congenital malformations, deformations and chromosomal abnormalities							

12: Birth trauma							
13: Acute intrapartum event							
14: Infection							
15: Other specified intrapartum disorder							
16: Disorders related to fetal growth							
17: Intrapartum death of unspecified cause							
Total (%)							
Neonatal death (N)							
N1: Congenital malformations, deformations and chromosomal abnormalities							
N2: Disorders related to fetal growth							
N3: Birth trauma							
N4: Complications of intrapartum events							
N5: Convulsions and disorders of cerebral status							
N6: Infection							
N7: Respiratory and cardiovascular disorders							
N8: Other neonatal conditions							
N9: Low birth weight and prematurity							
N10: Miscellaneous							
N11: Neonatal death of unspecified cause							
Total (%)							

Table 3: Maternal conditions in ICD-PM and the main maternal conditions (defined by ICD-10) included in each group

ICD-PM maternal condition group	Main maternal conditions included in group*
M1: Complications of placenta, cord and membranes	1. placenta praevia 2. other forms of placental separation and haemorrhage 3. placental dysfunction, infarction, insufficiency 4. fetal-placental transfusion syndromes 5. prolapsed cord, other compression of umbilical cord 6. chorioamnionitis 7. other complications of membranes
M2: Maternal complications of pregnancy	1. incompetent cervix 2. preterm rupture of membranes 3. oligohydramnios/polyhydramnios 4. ectopic pregnancy 5. multiple pregnancy 6. maternal death 7. malpresentation before labour 8. other complications of pregnancy
M3: Other complications of labour and delivery	1. breech delivery and extraction 2. other malpresentation, malposition and disproportion during labour and delivery 3. forceps delivery/vacuum extraction 4. caesarean delivery 5. precipitate delivery 6. preterm labour and delivery 7. other complications of labour and delivery, including termination of pregnancy

M4: Maternal medical and surgical conditions	1. pre-eclampsia, eclampsia 2. gestational hypertension 3. other hypertensive disorders 4. renal and urinary tract diseases 5. infectious and parasitic disease 6. circulatory and respiratory disease 7. nutritional disorders 8. injury 9. surgical procedure 10. other medical procedures 11. maternal diabetes, including gestational diabetes 12. maternal anaesthesia and analgesia 13. maternal medication 14. tobacco/alcohol/drugs of addiction 15. nutritional chemical substances 16. environmental chemical substances 17. unspecified maternal condition
M5: No maternal condition	1. no maternal condition identified (healthy mother)

Risk factors

Another cross-sectional study looked at what demographic factors might be associated with still births Drawing on data from the Indian Annual Health Surveys from 2010 to 2013, the author's analysed data from 8,86,505 pregnant women aged 15-45 across nine states in India. They found still birth rates (>=28 weeks) of 10 per thousand. The authors' recognized a potential for under-reporting and therefore a spuriously low still birth rate. Indicators of socioeconomic deprivation were strongly associated with an increase in stillbirth: rural residence (adjusted OR (aOR) 1.27, 95% CI 1.16 to 1.39), female illiteracy (aOR 1.43, 95% CI 1.17 to 1.74), low socioeconomic status (aOR 2.42, 95% CI 1.82 to 3.21), schedule caste background (aOR 1.11, 95% CI 1.04 to 1.19) and woman not in paid employment (aOR 1.15, 95% CI 1.07 to 1.24). Women from minority religious groups were at higher risk than the Hindu majority (Muslim (aOR 1.33, 95% CI 1.25 to 1.43); Christian (aOR 1.42, 95% CI 1.19 to 1.70)). While a few women smoked (<1%), around 9% reported chewing tobacco, which was associated with an increased odds of stillbirth (aOR 1.11, 95% CI 1.02 to 1.21). Adverse pregnancy and birth characteristics were also associated with stillbirth: antenatal care visits <4 (aOR 1.08, 95% CI 1.01 to 1.15), maternal age <25 years (aOR 1.29, 95% CI 1.21 to 1.37) and ≥35 years (aOR 1.16, 95% CI 1.04 to 1.29), multigravida (aOR 3.06, 95% CI 2.42 to 3.86), multiple pregnancy (aOR 1.77, 95% CI 1.47 to 2.15), assisted delivery (aOR 3.45, 95% CI 3.02 to 3.93), caesarean section (aOR 1.73, 95% CI 1.58 to 1.89), as were pregnancy complications (aOR 1.42, 95% CI 1.33 to 1.51).

Future Targets

The Every Newborn Action Plan (ENAP) calls for each country to achieve a rate of 12 stillbirths or fewer per 1,000 total births by 2030 and to close equity gaps. Fifty-six countries would need to accelerate their progress in order to meet the ENAP target – this means investment in quality antenatal and delivery care. India is likely to achieve that target and may be reach a single digit figure by 2030. If all countries met or exceeded the ENAP stillbirth target, 2.6 million stillbirths could be averted before 2030 compared to continuing the current trends. More ambitiously, if each country's stillbirth rate reached or fell below the current average rate in high-income countries (3 stillbirths per 1,000 total births) by 2030, 8.4 million lives could be saved. Although this scenario is aspirational, it shows what is possible with strong health systems and high-quality care. As the risk factors section indicates, there is an urgent need to invest in health, increase annual health budgets, continue private investments in health care in an effort to close equity gaps. Unless this is done, the progress of the past two decades will diminish, and many more lives will be lost.

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Monitoring an FGR pregnancy and optimal delivery timing

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Fetal Growth Restriction (FGR) can result from various maternal, fetal and placental conditions and affects up to 10% of pregnancies, making it one of the leading causes of infant morbidity and mortality. This complex obstetrical issue has diverse diagnostic criteria, relatively low detection rates, and limited preventative and treatment options.

The purpose of this paper is to outline an evidence-based, standardized approach for the prenatal diagnosis and management of fetal growth restriction.

The definition of FGR differs across guidelines and author groups. The criteria from an international Delphi consensus are the most widely recognized (see Table 1 and 2)[1]. which classifies IUGR into early onset and late onset IUGR.

Table 1: Main clinical characteristics of early and late-onset fetal growth restriction (FGR)

Characteristic	Early-onset FGR	Late-onset FGR
Main clinical challenge	Management	Detection
Prevalence	30 %	70 %
Gestational age at manifestation	<32 weeks	>= 32 weeks
Ultrasound findings	Fetus may be very small	Fetus not necessarily very small
Doppler velocimetry	Spectrum of Doppler alterations that involves umbilical artery, middle cerebral artery and ductus venosus	Cerebral blood-flow redistribution
Biophysical profile	May be abnormal	May be abnormal
Hypertensive disorders of pregnancy	Frequent	Not frequent
Placental histopathological findings	Poor placental implantation, spiral artery abnormalities maternal vascular malperfusion	Less specific placental findings, mainly altered diffusion
Perinatal mortality	High	Low
Maternal cardiovascular hemodynamic status	Low cardiac output, high peripheral vascular resistance	Less marked maternal cardiovascular findings

Table 2: Definitions for early and late onset fetal growth restriction (FGR) in absence of congenital anomalies, based on international Delphi consensus

Early-onset FGR GA < 32 weeks, in absence of congenital anomalies	Late-onset FGR GA>= 32 weeks, in absence of congenital anomalies
AC/EFW < 3rd centile or UA-AEDF Or 1. AC/EFW < 10th centile combined with 2. UtA-PI > 95th centile and/or UA-PI > 95th centile	AC/EFW < 3rd centile Or at least two out of three of the following 1. AC/EFW < 10th centile 2. AC/EFW crossing centiles > 2 quartiles on growth centiles* 3. CPR < 5th centile or UA-PI > 95th centile

*Growth centiles are non-customised centiles, AC, fetal abdominal circumference, AEDF, absent end-diastolic flow, CPR, cerebroplacental ratio; FEW, estimated fetal weight, GA, gestational age; PI, pulsatility index; UA, umbilical artery; UtA, uterine artery

Early-onset fetal growth restriction (FGR) is commonly linked to maternal vascular malperfusion of the placenta, which includes abnormal transformation of the spiral arteries, pathological changes in placental villi, and multifocal infarctions. These components lead to 'placental insufficiency' which are the main cause of placenta-mediated FGR. Elevated Doppler Umbilical Artery -PI usually precedes other Doppler changes, fetal heart rate variations, BPP modifications, severe hypoxemia, and acidosis in Early FGR.[2]

Late deterioration in early FGR, marked by severe placental insufficiency, is indicated by the reversal of EDF in the UA and generalized cardiovascular and metabolic failure. This includes changes in the ductus venosus (absent or reversed a-wave). These cardiovascular changes may precede or occur alongside STV alterations, leading to abnormal BPP scores, spontaneous repetitive decelerations on CTG, and stillbirth.

Monitoring FGR: Once early FGR is suspected or diagnosed, the pregnancy should be managed in tertiary-level fetal medicine and neonatal units following a uniform protocol. Multidisciplinary counselling involving neonatology and maternal-fetal medicine specialists is crucial.

Initial Diagnosis of FGR: For an initial diagnosis of FGR, a detailed obstetrical ultrasound is recommended, especially for early-onset FGR, as up to 20% of cases may involve fetal or chromosomal abnormalities.[4]

Genetic Counselling and Testing

- If FGR is combined with fetal malformation or polyhydramnios, genetic counseling and prenatal diagnostic testing (including chromosomal microarray analysis (CMA) should be considered.
- Chromosome abnormalities are more common in pregnancies with structural anomalies and FGR, with a mean rate of 6.4% for chromosomal abnormalities in fetuses without structural malformations.

Infectious Screening:

- Routine screening for toxoplasmosis, rubella, or herpes is not recommended for FGR pregnancies without other risk factors or ultrasound markers of fetal infection.
- PCR for CMV is recommended for women with unexplained FGR who opt for diagnostic testing with amniocentesis.[4]

Multimodality assessment: In structurally normal foetuses - multimodality assessment, UA, MCA, ductus venosus Doppler evaluation and CTG and is recommended. The TRUFFLE trial indicates that using a specific protocol with ductus venosus Doppler and cCTG for monitoring and delivery timing, leads to better outcomes. However, since cCTG is not universally available, Doppler evaluations, conventional CTG assessments, and BPP scoring should be used.[5]

Indicators of adverse perinatal outcome in EOFGR with abnormal umbilical artery waveforms: Loss of fetal gross body movement with ductus venosus Doppler index changes can predict fetal cord pH < 7.20. Loss of fetal tone is associated with pH < 7.00 or a base excess < -12 mEq/L. Observational studies have indicated that an abnormal biophysical profile (BPP) is a late manifestation of placental disease that appears to become abnormal 48 to 72 hours after ductus venosus doppler abnormalities in 90% of cases.[6]

Surveillance frequency: It should be based on the severity of FGR and UA abnormalities. Progressive deterioration of UA Doppler velocimetry warrants more intensive monitoring every 2–3 days when absent or reversed UA-EDF is present. There is no consensus on monitoring frequency, however, suggested management strategies have been described.[7,12,13] Most guidelines suggest – with Umblical PI more than the 95th percentile or in pregnancies with severe FGR (EFW less than the 3rd percentile)- weekly umbilical artery Doppler

evaluation should be done and doppler assessment up to 2 to 3 times per week when umbilical AEDV. In the setting of REDV, hospitalization is suggested, administration of antenatal corticosteroids, heightened surveillance with CTG at least 1 to 2 times per day, and consideration of delivery depending on the entire clinical picture and results of additional evaluation of fetal well-being. The presence of spontaneous repetitive late decelerations is accepted as an indication for delivery in viable pregnancies with FGR, irrespective of Doppler findings.[4]

Corticosteroid Prophylaxis: Most guidelines recommend corticosteroid prophylaxis for early FGR to prevent neonatal respiratory distress syndrome if birth is likely before 34 weeks. The Royal College of Obstetricians and Gynaecologists (RCOG) extends this recommendation up to 35 weeks and 6 days 7. ACOG (American college of obstetrician and gyanecologist) recommend the use of antenatal corticosteroids if delivery is anticipated before 33 6/7 weeks of gestation or for pregnancies between 34 0/7 and 36 6/7 weeks of gestation in women without contraindications who are at risk of preterm delivery within 7 days and who have not received a previous course of antenatal corticosteroids.[14]

Magnesium Sulfate Prophylaxis: Many guidelines also recommend magnesium sulfate for neuroprotection in growth-restricted fetuses, with suggested commencement times varying from before 29 to 33 weeks' gestation. Due to the lack of strong evidence for a uniform gestational age, it's advised to follow local or national guidelines.

Timing of delivery: The TRUFFLE study, the largest randomized trial on the timing of delivery in early FGR, was based on three randomization arms:

- Early ductus venosus Doppler changes (PI > 95th percentile)
- Late ductus venosus Doppler changes (a-wave at or below baseline)
- Reduced fetal heart rate STV on cCTG (< 3.5 ms before 29 weeks and < 4.0 ms after 29 weeks)

In all three arms, safety-net criteria (immediate delivery if / absolute indications for delivery), including spontaneous repeated persistent unprovoked fetal heart rate decelerations in all arms or STV < 2.6 ms at 26 to 28+6 weeks and < 3.0 ms at 29 to 31+6 weeks in the ductus venosus arms.

The protocol suggested delivery if reversed UA-EDF was observed after 30 weeks or if absent UA-EDF occurred after 32 – 34 weeks. In the 2-year follow-up of the Trial of Umbilical and Fetal Flow in Europe (TRUFFLE) study demonstrated that timing delivery based on ductus venosus doppler measurements, alongside cCTG safety-net criteria, improves long-term neurodevelopmental outcomes (2 years) in surviving infants.In countries where cCTG is unavailable, delivery timing should rely on a combination of Doppler velocimetry indices (primarily ductus venosus before 30 weeks) and conventional CTG, or BPP where performed.

- Delivery should be based on biophysical assessments or maternal indication, as follows:[8]

  At any gestational age: presence of maternal indication (e.g. severe pre-eclampsia, HELLP syndrome) or obstetric emergency requiring delivery

  - 24 + 0 to 25 + 6 weeks: personalized management
  - ≥ 26 + 0 weeks, deliver if any of the following is present: - Spontaneous repeated persistent unprovoked fetal heart rate decelerations, Altered BPP (score ≤ 4)
  - 26 + 0 to 28 + 6 weeks: deliver if ductus venosus a-wave is at or below baseline or STV < 2.6 ms
  - 29 + 0 to 31 + 6 weeks: deliver if ductus venosus a-wave is at or below baseline or STV < 3.0 ms
  - 32 + 0 to 33 + 6 weeks (permitted after 30 + 0 weeks): deliver if UA-EDF is reversed or STV < 3.5 ms
  - ≥ 34 + 0 weeks (permitted after 32 + 0 weeks): deliver if UA-EDF is absent or STV < 4.5 ms.

At term delivery at 37 weeks of gestation in pregnancies with FGR and an umbilical artery Doppler waveform with decreased diastolic flow but without AEDV/REDV or with severe FGR with EFW less than the third percentile and delivery at 38 to 39 weeks of gestation with FGR when the EFW is between the 3rd and 10th percentile and the umbilical artery Doppler is normal.Elective Cesarean delivery is recommended if one or more of the following is present: abnormal cCTG STV, ductus venosus Doppler alteration, absent or reversed UA-EDF, altered BPP, maternal indication.[4]

TRUFFLE compared ductus venosus Doppler and computer-generated short-term fetal heart rate variability (cSTV) in the monitoring and timing of delivery in early-onset FGR. After correction for prematurity, survival without neurologic impairment was found to be significantly higher in the group delivered according to late ductus venosus changes (95%) compared with cSTV (85%).[1] However,

caution is urged when extrapolating the findings of TRUFFLE to practice. TRUFFLE compared cSTV with ductus venosus Doppler, and results cannot be generalized to the visual interpretation of CTG. After 32 weeks of gestation, abnormal CTG findings will almost invariably precede Doppler abnormalities of the ductus venosus.[15] In TRUFFLE, delivery decisions guided by ductus venosus Doppler findings only accounted for about 11% of pregnancies allocated to the late ductus venosus findings group because most delivered due to other fetal or maternal indications. Prospective research is needed to further elucidate the role of ductus venosus doppler in pregnancies with early-onset FGR before its use in routine surveillance of pregnancies with FGR can be recommended.

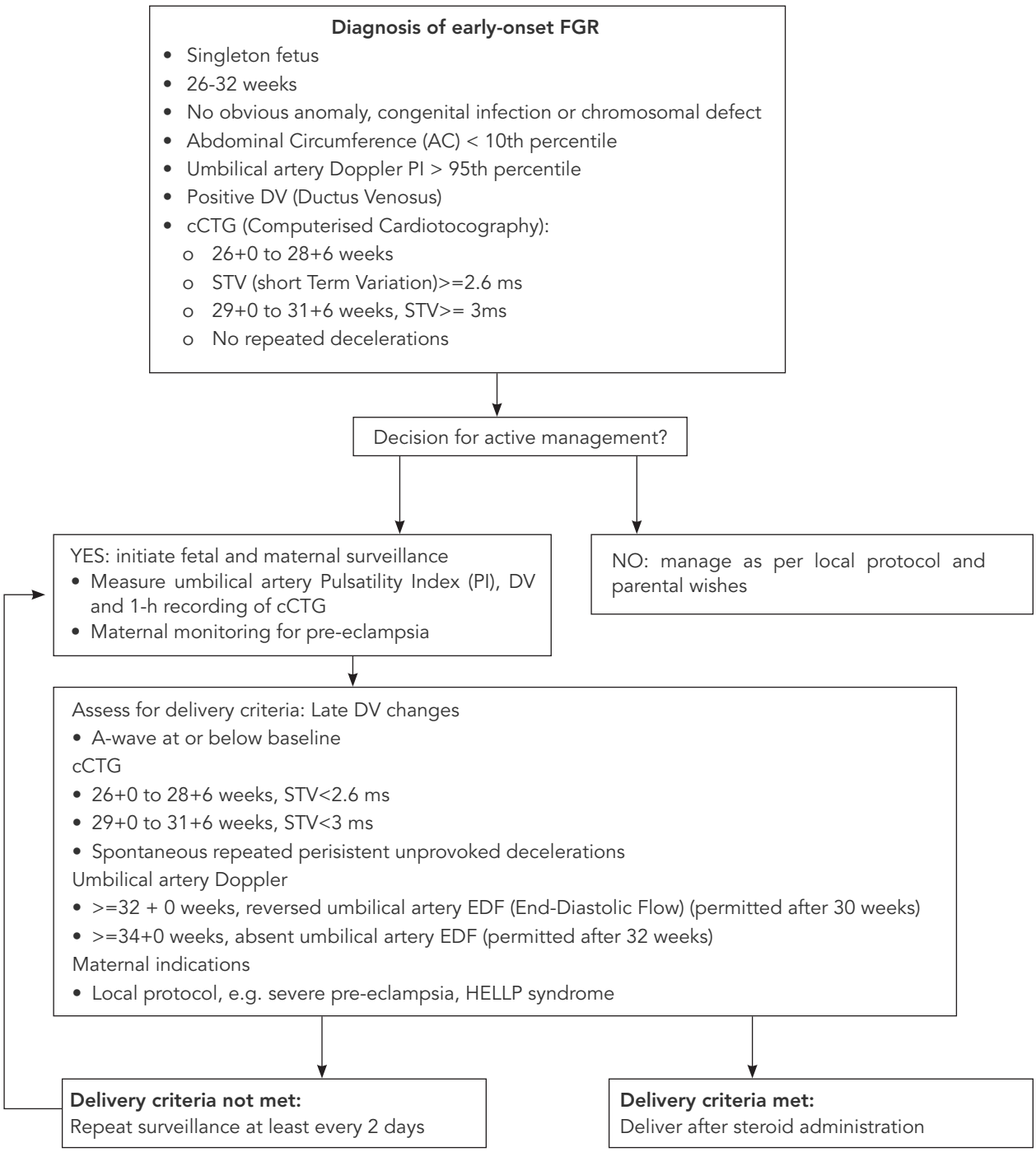

Figure 1: Flowchart explaining protocol recommended by TRUFFLE study for monitoring and management of pregnancies with early diagnosis of fetal growth restriction (FGR). Reproduced from Bilardo et al.[3]

Late-Onset Fetal Growth Restriction (FGR): The pathophysiology of late FGR differs from early FGR, being characterized by milder, more nonspecific placental lesions and/or alterations in oxygen and nutrient diffusion. Consequently, UA Doppler and venous alterations are rare, making it difficult to identify most late-FGR cases or predict adverse outcomes.[9]

The middle cerebral artery, the largest vessel in the fetal cerebral circulation, accounts for about 80% of cerebral blood flow. Fetal hypoxemia due to growth restriction triggers cerebral vasodilation, an early adaptive mechanism known as the brain-sparing effect. Studies have linked MCA vasodilatation (reduction in MCA-PI) or changes in its ratio with UA-PI to poorer perinatal outcomes. These include stillbirth, higher risk of Caesarean delivery, and increased risk of abnormal neurodevelopment at birth at 2 years of age. The use of MCA-PI and UA-PI ratios (CPR and UCR) helps identify subtle changes in placental and cerebral blood flow that may not be detected by evaluating a single parameter.[10]

Evidence suggests umbilical artery Doppler is not a reliable predictor of adverse outcomes in late-onset FGR, likely due to fewer placental pathological findings compared to early-onset FGR. Experimental modeling indicates a threshold of placental vascular obliteration is needed before Doppler abnormalities appear, so a normal Doppler in late-onset FGR doesn't rule out placental disease.

In late FGR cases, BPP often becomes abnormal only shortly before stillbirth, making it unreliable for setting monitoring intervals.[11]

Additionally, near-term fetuses appear to have a reduced tolerance to hypoxemia due to their higher metabolic rate compared to earlier gestation. Therefore, frequent monitoring of late FGR pregnancies is recommended, similar to early FGR cases.[10]

Monitoring Late FGR: Currently, MCA-PI and its ratios to UA-PI are the key Doppler parameters for monitoring late FGR. A large retrospective study found that in FGR pregnancies after 34 weeks, the median time between a low MCA-PI and stillbirth was ≤ 5 days. This suggests that, if delivery is not indicated by then, twice-weekly Doppler surveillance may be necessary after 34 weeks.The same study showed that nearly 90% of stillbirths occurred within 1 week of a normal BPP score in the presence of cerebral vasodilatation, indicating BPP may be less effective in determining fetal monitoring frequency.[11]

Given concerns about interobserver reliability of MCA-PI measurements, it's recommended to confirm any alterations in MCA-PI, CPR, or UCR within 24 hours to avoid false positives, especially when delivery timing depends on these findings.

Recommendations • In pregnancies with late FGR, delivery should be based on biophysical assessments or maternal indication as follows: [7]

- At any gestational age, deliver if one of the following is present:
  - Spontaneous repeated persistent unprovoked fetal heart rate decelerations.

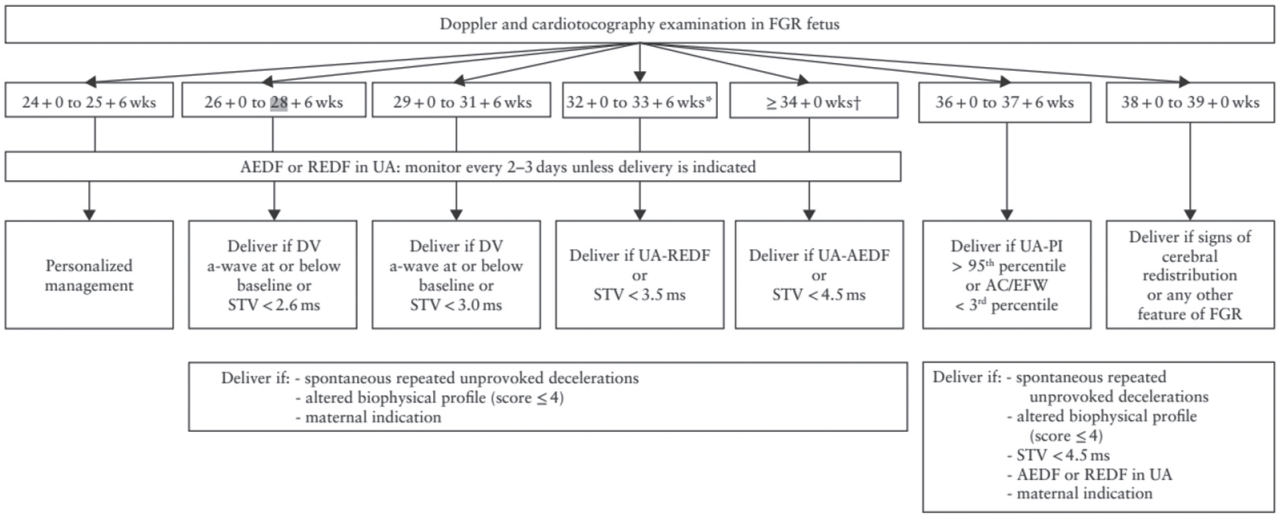

Figure 2 Recommended management of pregnancies with fetal growth restriction (FGR), based on computerized cardiotocography and Doppler findings. *Permitted after 30+0 weeks. †Permitted after 32+0 weeks. AC, fetal abdominal circumference; AEDF, absent end-diastolic flow; DV, ductus venosus; EFW, estimated fetal weight; PI, pulsatility index; REDF, reversed end-diastolic flow; STV, short-term variation; UA, umbilical artery; wks, gestational weeks.

- Altered BPP (score ≤ 4).
- Maternal indication (e.g. severe pre-eclampsia, HELLP syndrome) or obstetric emergency requiring delivery
- cCTG STV < 3.5 ms at 32 + 0 to 33 + 6 weeks and < 4.5 ms at ≥ 34 + 0 weeks.
- Absent or reversed UA-EDF.

◦ 36 + 0 to 37 + 6 weeks: deliver if UA-PI > 95th percentile or AC/EFW < 3rd percentile.

◦ 38 + 0 to 39 + 0 weeks: deliver if there is evidence of cerebral blood-flow redistribution or any other feature of FGR.

• In the absence of contraindications, induction of labor is indicated.

During labor, continuous fetal heart rate monitoring is recommended.

Conclusion

Early diagnosis, close follow-up and timely delivery of pregnancies with FGR are of crucial importance for peri-natal short- and long-term outcome.

The identification of FGR is not always straightforward, for several reasons. First, a single biometric measurement of fetal size is not sufficient to evaluate fetal growth, additional biophysical tools and/or evaluations are needed in order to identify FGR. Second, there are two phenotypes of FGR that differ significantly in many aspects. Knowledge of the clinical manifestation and progress of early-onset and late-onset FGR is of crucial importance for all aspects of management (from diagnosis to delivery).

In conclusion, the diagnosis and management of FGR pregnancies still pose some concerns and dilemmas. Few randomized controlled trials on management that are in progress will hopefully provide clear evidence on some unanswered questions.

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Prevention of Intrapartum Stillbirths

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Global incidence of 1 million intrapartum stillbirths and 904,000 early neonatal deaths due to so-called 'birth asphyxia' reflect the huge unmet gaps in quantitative and qualitative obstetric care of birth facilities worldwide.[1] In addition many intrapartum stillbirths occurathome oron the wayto a facility, so innovative approachesare required to address delays in accessing the existing obstetric care.[2,3] There is also a huge burden of under-reported near misses and HIE (Hypoxic is chemic encephalopathy) babies presumably caused by adverse intrapartum events which need to be studied in detail to understand the wide spectrum of social, economic and medical determinants of this devastating condition. Strategies for prevention of intrapartum stillbirths need to be prioritized as per the national, community and health facility specific needs.

Preventive Interventions in the antenatal period

The proportion of intrapartum stillbirths decreases as the National health care and emergency obstetric services improve. Approximately 50 percent of stillbirths in sub- Saharan Africa and South Asia occurred during labor and birth, largely because of a lack of skilled birth attendants and facilities for cesarean birth. By comparison, only 6 percent of stillbirths occurred during labor and birth in Western Europeand North America.[4,5] However a lot of these stillbirths irrespective of nationality have their genesis in the antenatal period. For each 1% increase in the percentage of women with at least 4 antenatal visits, the intrapartum stillbirth rate decreased by 0.16 per 1,000 births ($p<0.0001$).[6] An optimum antenatal care makes a strong foundation for favorable intrapartum outcome. 4 to7 antenatal visits with a standardized protocol of care can make an impactful change in this regard.[7, 8]

Identification and appropriate Management of Pre-ecclampsia, Diabetes and Foetal growth restriction will minimise the intrapartum risk of these babies who are prone to considerable perinatal morbidity and mortality during labour. Each high risk baby needs to be triaged at the labour ward to assess the individual reserve and rule out antenatal hypoxia. Also the type of fetal monitoring in labour may need to differ as per triaging at admission. For those mothers who are undergoing antenatal care atcommunity level need to be referred appropriately as per their risk assessment before onset of labour. Mobilizing communities to address pregnancy-related care is an important step in reducing the large burden of intrapartum complications.[9] This would further require functional linkages between the community and facility and strengthening of health systems in general.

Preventive Interventions in the intrapartum period

Nursing leadership and skilled midwives/ labour nurse can make a strong foundation of intrapartum care. Strict ongoing vigilance in labour and a rapid response team for performing appropriate instrumental birth or cesarean delivery if needed results in substantial reductions in perinatal mortality during labor. As Caesarean section rates increased from 0 to 8%, for each 1% increase, there was a decrease of 1.61 intrapartum stillbirths per 1,000 births.[6] Intervening too early and too late in labour are both

huge challenges in modern obstetric practice. Working in teams with skilled personnel onsite and discouraging solo obstetric practice can also positively contribute to optimum intrapartum care.

Basic neonatal resuscitation mayavert 30% of intrapartum-related neonatal deaths in facility settings and emphasize that better use of resuscitation in those settings.[6] Neonatal resuscitation may be performed by arange of health workers who already attend deliveries in primary and secondary care facilities with significant reductions of intrapartum-related stillbirths and neonatal deaths.

Continuous CTG facilities for high risk labour is mandatory to identify high risk fetuses who deteriorate rapidly in labour and may need to be bailed out rapidly. Institutional strategies should be developed toward risk assessment and management of fetal growth restriction and abruption because population-based studies suggest that these two obstetric complications account for over 50 percent of fetal deaths in the peripartum period. Understanding acute Hypoxia and emergent intrapartum events (abruption, cord prolapse and rupture uterus) and differentiating this from evolving hypoxia events needs atleast one experienced skilled care provider in leadership role round the clock. Second stage management needs special training as vulnerable babies can quickly deteriorate in this period due to frequent uterine contractions, head compression and cord compression.

Regular on siteTraining of community & Facility Health care providers

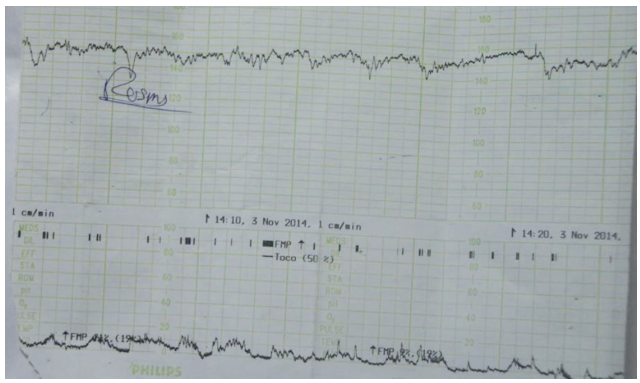
Maximizing the contribution of each type of provider in the pregnancy labour pathwayis critical fordiagnosing, referring and managing the perinatalperiod. The value of training the lay community and traditional birth attendants to recognize problems, stabilize women in jeopardy, and transfer them appropriately cannot be over emphasised. Nurses at all facilities need to be trained in midwifery care and regular multidisciplinary training with special emphasis on labour care, fetal monitoring and emergency obstetric drillsshould be part of clinical governance.

Perinatal clinical audits

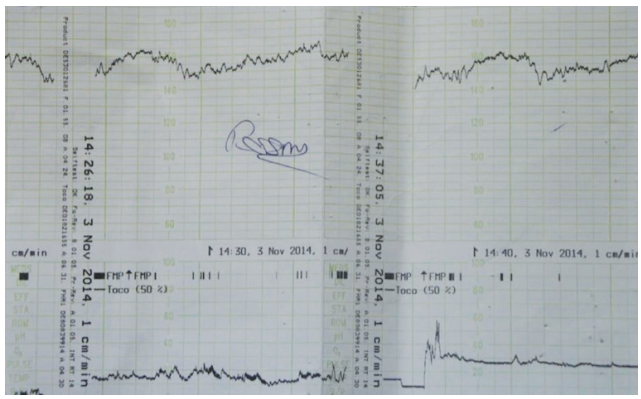
Continuous evaluation of adverse outcomes directed toward finding correctable causes of intrapartum stillbirth is an important component of any system of care directed at improving pregnancy outcomes.[10] The effect of perinatal audit depends on the ability to close the audit loop. Without effectively implementing the solutions to the problems identified, audit alone will not improve the quality of care. Implementing a national audit was associated with a significant reduction in late stillbirths (≥37 weeks of gestation) in the Netherlands, United Kingdom, and New Zealand after substandard care was found in 20 to 30 percent of stillbirths, with a rate as high as 60 percent for intrapartum stillbirths.[11] Multiple investigations have shown that even in well-equipped facilities sub-standard care can happen due to factors largely attributed to communication and documentation issues.[12]

We present below a clinical situation to highlight the common gaps in obstetric care in a well quipped facility.

25yr old primigravida with 40 weeks pregnancy came in spontaneous labour. At admission the MHR is not labelled on the CTG strip, and the strip does not show fetal cyclicity. The baseline and variability is reassuring.

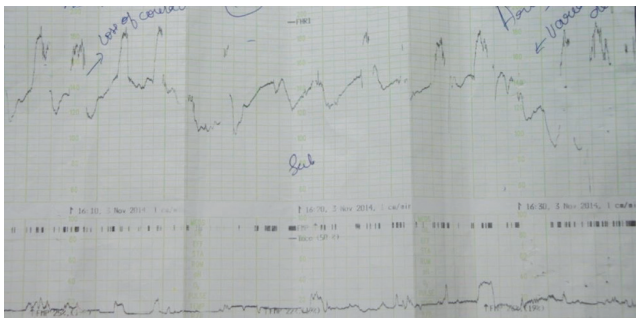


As labour progressed the CTG strip continues to have a stable baseline and variability. However the fetus does not show cyclicity in this strip too which has been taken 10 minutes later. On closer look however the baseline is showing a subtle rise. Patient was augmented with oxytocin now.

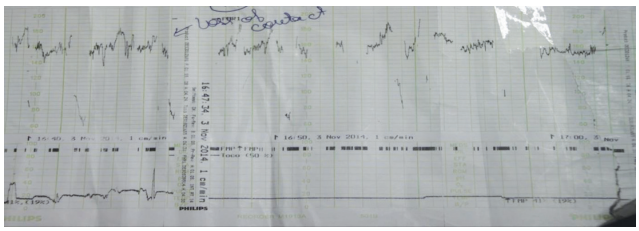


As labour further progresses the CTG monitoring is discontinued and the FHR is measured by

intermittent Doppler every 15 minutes. CTG after 2 hours shows an indeterminable baseline and reduced variability. There is no documented MHR and the undulating pattern of FHR is showing significant decompensating features in the fetus. CTG in the preceding last 2 hours is not available. However documented FHR with hand doppler every 15 minutes shows normal baseline.



The last CTG immediately after the previous one seems to have recovered with determinable baseline and accelerations. However in reality, the machine has picked up the maternal heart rate. The baby was stillborn and delivered at 17:00 hours.



Learnings-

- Prerequisites of CTG interpretation should always be met. Details of mother, labourevents, paperspeed, Maternal Heartrate and Uterine contractions should be documented in every CTG strip.
- Cyclicity including atleasttwo behavorial patterns ofthe fetus (Deep sleep, Active sleep, and active wakefulness) shows an intact neurological status.
- The Baseline is the most critical part of CTG as variability, decelerations, accelerations can be interpreted only if you have a stable baseline.
- Unstable Undulating Baseline with decreased variability can be the most adverse critical parameter before impending fetal death.
- The CTG machine can continue to record maternal heart rate if FHR significantly falls or disappears.
- Every facility should have documented labour protocol for fetal monitoring inhigh risk and low risk labours.

Key Message

A large number of intrapartum stillbirths may happen due to severe HIE or perinatal asphyxia. Therefore continuous strict vigilance for the acute intrapartum events like rupture, cord accidents, abruption and hyperstimulation is crucial. Training in CTG interpretation, instrumental births and Category 1 caesarean section of onsite care providers is paramount to safe care. Nursing and clinician leadership need to have a helicopter view and situational awareness as clinical events are dynamic and ever changing in the labour ward.

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How to Investigate a Stillbirth: The Clinical Perspective

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Pregnancy is a time of joy and excitement for the parents and the society and a blessing in the form of a baby. However, it becomes equally distressing when the pregnancy ends in stillbirth. Annually, an estimated 2.6 million stillbirths occur worldwide and the majority (98%) of them occurs in low- and middle-income countries. India is among the top ten countries with the highest stillbirth numbers, with a stillbirth rate of 23.3/1000 births in 2015.[1]

Definition

World Health Organization(WHO) has defined Stillbirth as a newborn ≥28 weeks of gestation with no signs of life at birth, weight ≥1000 g, crown-heel length (CHL) ≥35 cm.[2]

Fresh stillbirth or intrapartum stillbirth is defined as stillbirth occurring after the onset of labor in less than 12 hours before delivery with no skin changes, weighing more than 1,000 grams and more than 28 weeks of gestation, but excludes severe lethal congenital abnormalities.

Macerated stillbirth or antepartum stillbirth is a baby born with all the changes, which occur in a fetus retained in utero after death and the death occurred before the initiation of labor. A "macerated" fetus shows skin and soft-tissue changes (skin discoloration or darkening, redness, peeling, and breakdown).[3]

Risk Factors

The risk factors for stillbirth can be broadly divided into fetal, placental and maternal causes contributing to 35%, 30% and 10% respectively. Almost 15-35% of stillbirths are due to unexplained causes. The various risk factors for stillbirth are depicted in Table 1.

The causes of stillbirth are classified as obstetric conditions (29.3%); placental abnormalities (23.6%); fetal genetic/ structural abnormalities (13.7%); infection (12.9%); umbilical cord abnormalities (10.4%); hypertensive disorders (9.2%); and other maternal medical conditions (7.8%).[4]

Table 1- Etiology of Stillbirth[3]

FETAL CAUSES	PLACENTAL CAUSES	MATERNAL CAUSES
Chromosomal abnormalities	Antepartum Hemorrhage	Medical Disorders- Diabetes, Hypertension,Thyroid disease, Renal disease, Thrombophilia, Infection (TORCH, Parvo, Malaria, Hepatitis E)
Non-chromosomal birth defects	Fetal maternal haemorrhage	Trauma
Non-immune hydrops	Placental insufficiency	Age > 35 years
Infections	Intrapartum asphyxia	Abnormal labour
	Vasa previa	post term pregnancy
	Twin twin transfusion syndrome	Previous Fetal Growth Restriction
	Chorioamnionitis	Previous Stillbirth

Diagnosis

Mother usually complains of reduced or absent fetal movements. The diagnosis of stillbirth by auscultation of the fetal heart by Pinard stethoscope or cardiotocography is not accurate. Real-time ultrasound should be performed as it provides direct visualisation of the fetal heart. However it becomes challenging particularly in mothers with BMI over 30 kg/m^2, abdominal scars and oligohydramnios. It is advisable to perform colour Doppler of the fetal heart and umbilical cord in these cases.

In addition to the absence of fetal cardiac activity, other secondary features might be seen: collapse of the fetal skull with overlapping bones,[5] hydrops, or maceration [meaning to soften in liquid] resulting in unrecognisable fetal mass. Intra-fetal gas (within the heart, blood vessels and joints) is another feature associated with late Intra uterine fetal demise (IUFD) that might limit the quality of real-time images.[6,7] In the lack of ultrasonography the features can be seen on skiagram (X-Ray).

The diagnosis must be confirmed by second opinion of a trained doctor. If the women perceives passive movements after diagnosis of stillbirth; a second ultrasound must be performed for confirmation. The approach for diagnosing a stillbirth is depicted in Figure1.

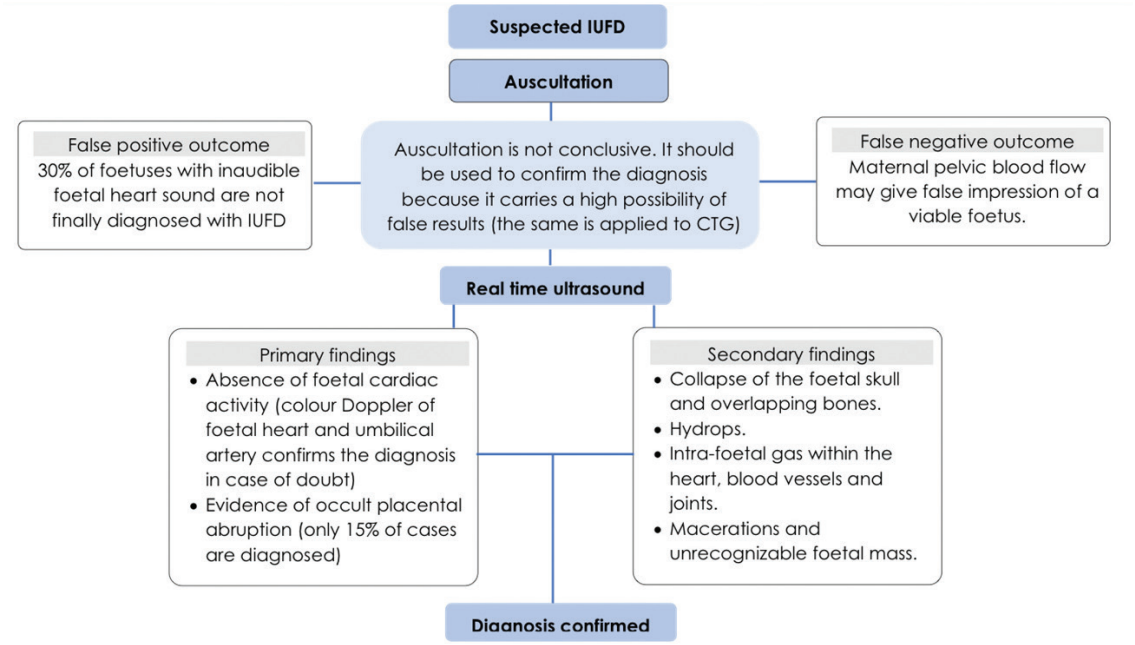

Figure 1- Approach in diagnosing a stillbirth

Counseling

IUFD can have devastating psychological, physical and social costs, with ongoing effects on interpersonal relationships and subsequently born children. Parents who experience perinatal death are at increased risk of hospital admission owing to postnatal depression and suicide.[8,9] Furthermore, parental relationships have a 40% higher risk of dissolving after late IUFD compared with live birth.[10] Breaking bad news is not easy and must be done with sensitivity, compassion, and empathy with the patient and the family together.

- The first step is to give some privacy to the parents and allow them to grieve. If no one is with the mother, ask if she would like to make a call or if you can call someone for her.
- Next is to recognize whether the patient is ready to deal with the situation and allow her to leave if necessary.
- There may be instances when the husband or family becomes angry and difficult to deal with. Most of the time, they are just trying to ventilate and/ or decompensate. Under no circumstances the doctor must become confrontational and always be empathetic to them.
- If needed, refer the mother for grief counseling and support groups.
- After the initial counseling, further management plan including recommended workup, delivery options and complications should be discussed.
- Follow up plan for risk of recurrence, prevention of recurrence and management of future pregnancy should be done postpartum.

Maternal Evaluation

A systematic approach is required to evaluate fetal death and to determine the underlying etiology. Comprehensive maternal (medical, social, family) and pregnancy history should be taken following all perinatal deaths.[3] Taking a detailed history is a vital first step that will guide subsequent investigations into the cause of death of the baby. The essential components in history for evaluating a stillbirth are illustrated in Table 2]

Table 2- History for evaluating a stillbirth.

Present Pregnancy history	• Gestational age at death (based on accurate dating criteria and determination of timing of death) • Medical conditions complicating pregnancy Hypertensive disorders, Gestational diabetes, Cholestasis of pregnancy Hepatitis E, APLS • Pregnancy complications Multiple gestation, Preterm labor, Rupture of membranes, Fetal structural or chromosomal abnormalities, Infections, Trauma, Abruption • Maternal serum marker screen, ultrasound finding.
Past Medical history	Hypertension, diabetes, cardiopulmonary disease, thyroid disease. Drug or substance abuse. Genetic condition.
Past Obstetric history	Stillbirth, fetal growth restriction, abruption, hypertension, congenital anomalies.
Family history	Stillbirth or recurrent miscarriage, Genetic syndromes, Significant medical illnesses (pulmonary embolism, deep venous thrombosis).

Clinical examination is helpful in detecting conditions like hypertension, anemia, jaundice, fever, fetal growth retardation, large for gestational age, abruption and chorioamnionitis which are known to cause stillbirth.

Clinical and laboratory tests should be recommended to assess maternal wellbeing (including coagulopathy) and to determine the cause of fetal death, the chance of recurrence and possible means of avoiding further pregnancy complications.[12] The core investigations for evaluating a stillbirth are depicted in Table[3].

Table 3- Maternal Investigations in evaluating stillbirth[12]

TEST	INDICATION	Timing
CBC, LFT, RFT, CRP, Bile salts	Preeclampsia, Hemorrhage, Sepsis, Obstetric cholestasis, Jaundice	As soon as possible after stillbirth
Coagulopathy screening	For baseline coagulation profile. DIC- usually sets in four weeks after IUD	
Kleihauer Betke test	To rule out Feto-maternal Hemorrhage	
Maternal Bacteriology (Blood culture, midstream urine, vaginal and cervical swabs)	Suspected Infection (Fever, foul smelling liquor)	
Random blood glucose & HbA1c in absence of prior screening	To rule out Diabetes if Screening not done already	
TFT	Uncontrolled Hypothyroidism	Before discharge
Thrombophilia screening	Maternal Thrombophilia*	6 weeks after birth
Anti-red cell antibody	Immune hemolytic disease	as soon as possible after diagnosis with ultrasound suggesting hydrops
Anti-Ro & anti-La antibody; APLA	Autoimmune disease/ Antenatal USG suggestive of fetal bradycardia. Preterm IUFD following severe preeclampsia or unexplained FGR.	as soon as possible after diagnosis with ultrasound suggesting hydrops or autopsy finding with endomyocardial fibrosis APLA investigations at 12 weeks post delivery
Antiplatelet antibody	Alloimmune thrombocytopenia	as soon as possible after diagnosis with imaging or autopsy suggesting fetal intracranial hemorrhage
Parental Karyotyping	Parental balanced translocation	as soon as possible after diagnosis/ suspicion of fetal genetic condition
Toxicology	Drug use/ suspected Poisoning	as soon as possible if history or presentation of drug use/Suspicion of poisoning

CBC- complete blood count, LFT- liver function test, RFT- renal function test, CRP- C-reactive protein, DIC- disseminated intravascular coagulopathy, TFT- thyroid function test.

*Thrombophilia screening is done when there is stillbirth associated with uteroplacental insufficiency or fetal growth restriction or associated thrombosis.

Fetal Evaluation

At delivery the fetus, placenta, and cord must be examined carefully. Recommendations include various fetal measurements such as weight, toe-heel length, fetal imaging including whole body X-ray with anterior-posterior and lateral views, as well as external and internal macroscopic examination. Estimation of the interval between intrauterine death and delivery should be performed by assessing the grade of maceration.[10] The degree of skin sloughing as well as signs of maceration should be noted, to determine timing of demise in relation to delivery. Photographs should be obtained; of the whole body, frontal and profile views of the face, extremities, palms; and close-up photographs of specific abnormalities. Full investigations including postmortem examination and placental histology can give a probable cause of stillbirth in >75% cases.[3] Table [4] depicts the core fetal investigations in evaluating a stillbirth

Table 4- Core Fetal investigations in evaluating stillbirth[12]

INVESTIGATION	INDICATION	TIMING
Fetal & placental histology (Fetal blood, fetal swabs, placental swabs)	Fetal infection	as soon as possible after birth
Fetal & placental tissue for cytogenetics (Fetal cord, placenta)	Aneuploidy, single gene disorder Suspected genetic condition	as soon as possible after birth after parents consent
Postmortem examination (External, autopsy, microscopy, X ray, placental & cord, radiological imaging)	All cases	

The following should accompany the infant for postmortem examination

- Autopsy consent form
- Placenta (fresh and unfixed)
- Comprehensive maternal (medical, social, family) and pregnancy history
- Copies of the death certificate and copies of all antenatal ultrasound reports
- Copy of prenatal karyotyping results if available
- Findings from initial external examination performed at birth by attending clinician
- Sampling of cord and placental tissue for chromosomal analysis. If a prenatal karyotype has already been performed, these samples should still be taken for DNA extraction and storage

The placenta should be examined, and sent to pathology for histologic evaluation. Any umbilical cord abnormalities such as knots, should be noted. Autopsy reduces the number of unexplained fetal deaths by at least 10%.[13] Conditions such as abruption, placental infarcts, umbilical cord thrombosis, velamentous cord insertion, and vasa previa may be diagnosed. Placental evaluation can also yield important information regarding infection, genetic abnormalities, anemia, and thrombophilia. Umbilical cord knots and tangling should be noted but interpreted carefully as cord entanglement occurs in around 25% of normal pregnancies.[14] Figure 2 illustrates fetal evaluation of stillbirth.

Cytogenetic testing and postmortem examination is contraindicated if parental consent is not obtained. If parents are uncomfortable with a full autopsy, a limited autopsy can be done by an external examination, X-ray (infantogram), MRI and clinical photos. Other alternatives include post-mortem needle biopsy; laparoscopic autopsy, and small incision access for focused investigation of suspected abnormalities.

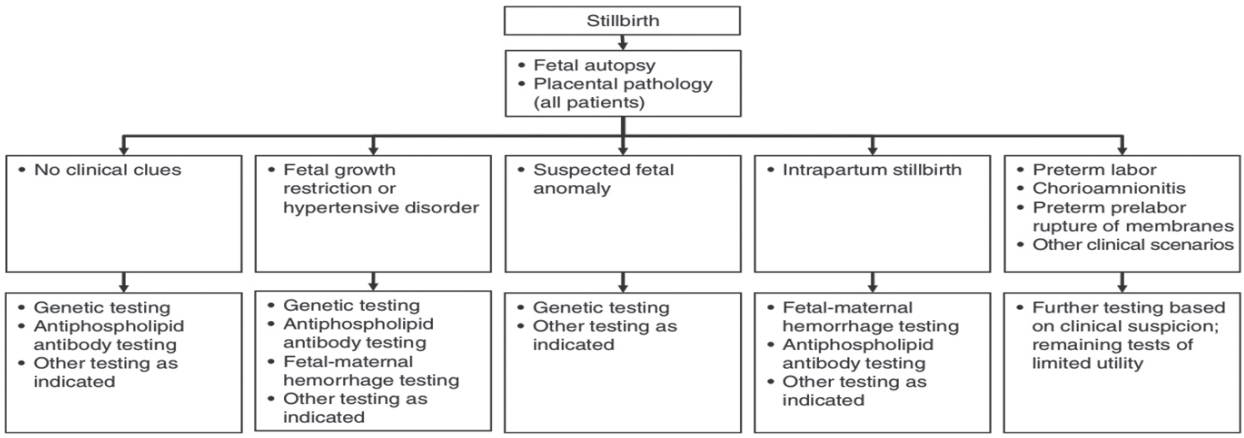

Figure 2- Fetal evaluation of stillbirth.[15]

Counseling for Future Pregnancy

Future reproductive choices and management decisions made in subsequent pregnancies can be altered after a stillbirth occurs. Table [5] illustrates the recurrence risk of stillbirth due to various factors. Stillbirth due to placental causes or preterm birth are likely to recur. Causes like antiphospholipid antibody syndrome may benefit from treatment and can lead to more favourable outcomes in the future pregnancy if identified. Women with known risk factors, such as smoking, a BMI above 30 kg/m^2, and poorly controlled pre-gestational diabetes, can benefit from modification and optimisation of health prior to a subsequent pregnancy. When the cause of stillbirth remains unexplained, treatment for a likely placental cause may improve outcomes in the subsequent pregnancy.

Table 5- Recurrence risk of stillbirth due to various factors.[3]

Etiology with previous stillbirth	Recurrence risk
Abruption	9–15%
Trisomy -21, 18, 13	1–2%
Autosomal recessive disorders	25%
X-linked disorders	Increase in male offsprings
Pre-eclampsia	14%
FGR	20%

Following recommendations are made for prevention of stillbirth in subsequent pregnancy.

- Evaluation and workup of previous stillbirth & determination of recurrence risk.
- Smoking cessation.
- Weight loss in obese women (pre pregnancy only).
- Genetic counseling if family genetic conditions exist.
- Screening of pre-eclampsia- pregnancy-associated plasma protein A & uterine artery doppler pulsatility index.
- Screening of diabetes- oral glucose tolerance test.
- Screening of FGR- assessment of risk factors, symphysiofundal height & umblical artery doppler.
- Screening of acquired thrombophilia- lupus anticoagulant, IgG and IgM for both anticardiolipin and b2-glycoprotein antibodies.
- First-trimester screen- pregnancy-associated plasma protein A, human chorionic gonadotropin, and nuchal translucency* or cell-free fetal DNA testing.
- Low-dose aspirin (60–150 mg) has been widely evaluated as a method for preventing placental-related complications in pregnancy, and in particular pre-eclampsia.[10]
- Low molecular weight heparin is recommended only for the prevention of venous thromboembolism and treatment of anti-phospholipid syndrome in pregnancy.
- Fetal sonographic anatomic survey at 18–20 weeks.
- Offer genetic screening if not performed in the first trimester or single marker alpha fetoprotein if first trimester screening is already performed.
- Sonographic screening for fetal growth restriction after 28 weeks Antepartum fetal surveillance starting at 32 weeks of gestation or 1–2 weeks earlier than previous stillbirth.
- Planned delivery at 39 0/7 weeks of gestation or as warranted by other maternal or fetal comorbid conditions.

Conclusion

Identification of the actual cause of stillbirth by complete evaluation of both mother as well as fetus helps a clinician to manage that particular woman and to plan strategies to decrease the stillbirth rate. Proper counseling including bereavement support with assigning cause of stillbirth after complete postnatal workup is likely to help. When all reasons seem not applicable the case remains "unexplained stillbirth" – a diagnosis of exclusion.

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How to Investigate a Stillbirth - The Genetic Perspective

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Introduction

Stillbirth is defined as fetal death in utero after 20 weeks of gestation and accounts for 60% of all perinatal deaths. However, the WHO definition of stillbirth is a fetus without signs of life, born after completed 28 weeks of gestation or birth weight >500 g, if the gestational age was unknown.

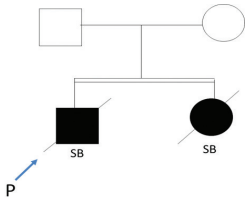
The multiple causes of stillbirth are usually grouped under maternal, fetal and placental etiologies [Table 1]. Real world data suggests that two thirds of stillbirths are unexplained.[1] However, a systematic approach aids in defining an etiology in a significant percentage of patients. Data from fetal autopsy performed for 300 fetuses with intrauterine fetal death reported a diagnostic yield determined from fetal autopsy in 69.6%. This included placental and umbilical cord abnormalities in 46.6%, birth defects in 13.6% and chromosomal disorders in 6.6% cases.[2] For families, who have been expecting the birth of a child, understanding a cause can help in the process of bereavement and healing. Additionally, a defined etiology aids genetic counseling for recurrence risks estimation and future reproductive options including preventive strategies.

Table 1 : Etiology of Stillbirth

Maternal	Fetal	Placental and Umbilical Cord
Perinatal Infection	Fetal growth restriction	Placental abruption
Bacterial Group **B** Streptococcus, E coli, Listeria monocytogenes		Ruptured vasa previa
Viral - TORCH		Structural or vascular malformations
Protozoal		Confined placental mosaicism
Hypertension / preeclampsia	Twin pregnancy complications	Umbilical cord abnormalities
Antepartum hemorrhage	Feto maternal hemorrhage	
Chronic maternal disorders	Birth trauma	
Diabetes, SLE, sepsis, cholestasis, maternal injury	Congenital anomalies	
	Genetic disorders	

The approach to evaluation of stillbirth within a genetic perspective through case examples is presented below.

Case 1



Non consanguineous couple with two term stillbirths, one male and one female child. The proband is the affected individual in the family who brings the family with genetic disorder to notice. The clinical presentation here is stillbirth that could be due to one of many causes that requires detailed evaluation to define the etiology. Detailed examination and testing is best done in the proband. The opportunity for testing the proband must not be lost and appropriate counseling is essential to enable the bereaved family to make appropriate decisions.

Case 2

Primigravida with early onset fetal growth restriction (FGR) and loss of cardiac activity at 24 weeks scan. Detailed history did not reveal any history of fever, rash or exposure to teratogen. Fetal examination at autopsy did not identify any major or minor malformations except fetal growth restriction. Microscopic examination of placenta identified intranuclear and intracytoplasmic inclusions, that stained positive for cytomegalovirus (CMV). Maternal CMV IgG was positive, and IgM was equivocal and the CMV PCR was positive in the placental sample consistent with a diagnosis of CMV as the etiology for this stillbirth. Infections are causative of stillbirth in 10-20% cases and include E coli, group B streptococcus, enterococcus along with Parvovirus, TORCH group, especially CMV and syphilis. Infection related stillbirths can be multifactorial with preterm delivery and placental causes as associations in 68% cases. Asymptomatic Parvovirus infection in the absence of clinical and histological features is unlikely to cause stillbirth. Untreated syphilis and malaria can cause stillbirth due to placental insufficiency ore direct fetal infection. Cytomegalovirus remains the most common amongst the TORCH group and the presence of viral inclusions, as in this case, are strong indicators of fetal infection. Routine TORCH screening is not recommended in stillbirth evaluation. Viral or bacterial infection testing is recommended in the presence of infection evidence on fetal autopsy or placental examination.[3]

Genetic syndromes are a well-established cause for stillbirth and the approach to genetic evaluation is depicted in Figure 1. Based on the detailed family history, maternal and pregnancy details appropriate genetic tests can add significant information to aid counseling in this clinical scenario.

Case 3

Low risk second gravida with intrauterine fetal demise identified at 28 weeks gestation. No significant family history, normal antenatal scans and low risk first trimester aneuploidy and preeclampsia screen. The facial gestalt on fetal autopsy suggests Trisomy 21 that is confirmed by chromosomal testing of fetal tissue.

Chromosomal abnormalities account for upto 10-20 % of stillbirths. Karyotype abnormalities are present in 6-13% stillbirths, including normally formed fetuses, but with a higher incidence of 20% in the presence of malformations or FGR. The common chromosomal disorders include Trisomy 21, 13, 18 and Monosomy X. However, the challenges of karyotype testing in stillbirth include a test failure rate of upto 50%. This can be circumvented by prenatal fetal testing by amniocentesis or chromosomal microarray testing on fetal DNA sample obtained postnatally.[4] Chromosomal Microarray (CMA) testing is a robust test that identifies all unbalanced abnormalities of structure and number identified by karyotype and also additional small copy number variants not detected by karyotype. Microarray is the preferred genetic test to evaluate for fetal chromosomal abnormalities in stillbirth. In a meta-analysis to define the added utility of CMA over normal karyotype in stillbirths, CMA had a higher test success rare of 90% compared to 75% of karyotype. The incremental yield of CMA over karyotype was 4% for pathogenic CNVs and 8% for variants of uncertain significance (VUS). The yield in fetuses with associated structural abnormalities was 4-10% vs 3% in structurally normal fetuses. The most common pCNV was 22q11.2 microdeletion.[5] This information is of utility in counselling families for appropriate genetic testing. An inherent challenge of CMA are the variants of uncertain significance that require expert genetic counselling. Confined placental mosaicism where chromosomal abnormalities are present only in the placenta and not in the fetus is also associated with an increased risk of stillbirth but is not part of clinical testing.

Case 4

Second gravida. The first female child died at 14 months of age due to recurrent pneumonia and she had developmental delay. The cause was

unknown. In the current pregnancy there were features of lethal skeletal dysplasia and intrauterine fetal death on the follow up scan. Fetal autopsy including radiographs suggested differentials of Achondrogenesis type 1b, Atelosteogenesis type I/ II / III and Fibrochondrogenesis. Exome sequencing in the fetal DNA sample confirmed compound heterozygous variants in the SLC26A2: c.532C>T, p.R178X and c.1382C>T, p.A461V, confirming autosomal recessive Atelosteogenesis type II. This confirmed diagnosis helped to inform the family of 25% recurrence risks and counseling for future reproductive options.

Lethal congenital anomalies with a uniformly poor prognosis like the case above may have a monogenic etiology. In addition to lethal skeletal dysplasias, others include bilateral renal agenesis, neural tube defect s like anencephaly or iniencephaly, urorectal septal malformations and amniotic band syndrome. Neuromuscular disorders like congenital myotonic dystrophy presenting with associated polyhydramnios must be considered separately as exome sequencing would not identify this triplet repeat disorder (Case 5). Hence appropriate genetic tests require a phenotype driven differential diagnosis and a knowledge of the armamentarium of genomic tests and their appropriate applications in stillbirth testing.

Case 5

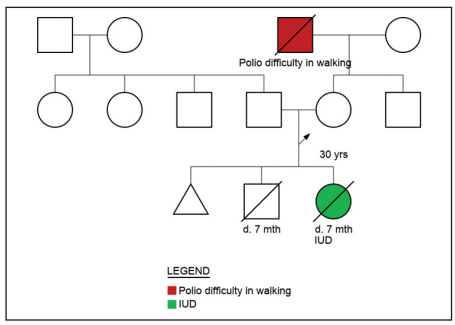
Bad obstetric history with one first trimester loss, second preterm delivery at 7 months gestation and neonatal death.

Third pregnancy is an intrauterine death at 30 weeks gestation. Both pregnancies are complicated with gestational diabetes and polyhydramnios

The pedigree and history analysis along with examination of the mother suggested a possibility of autosomal dominant myotonic dystrophy type 1with congenital myotonic dystrophy in the fetus.

Confirmation of the diagnosis was by Triplet repeat primed PCR (TP-PCR). Chromosomal microarray and ES will not identify this genomic disorder.

Confirmation of diagnosis is essential for counseling for maternal medical management along with 50% risk of recurrence in each conception.



With the improvement in sequencing technologies and ability to interpret genomic data, exome sequencing (ES) can be utilized to investigate the potential genetic causes of fetal death, particularly in cases where other diagnostic methods (like autopsy or conventional genetic testing) have not provided clear answers. There are limited studies on the utility of exome sequencing in unexplained stillbirth, particularly in the absence of congenital anomalies. Inborn errors of metabolism, cardiac abnormalities of rhythm and cardiomyopathy genes are postulated as etiologies in this scenario. However, the former usually would present with additional abnormalities like nonimmune hydrops fetalis, organomegaly, cardiomegaly or congenital anomalies.

Factors influencing the ES yield include structural anomalies, dysmorphism, consanguinity, and a positive family history, all factors contributing to an increased yield compared to unexplained stillbirth. Diagnostic yield of exome sequencing for monogenic disorders therefore is dependent on the study cohort. Stillbirths with congenital anomalies report a yield of upto 50%.[6] A yield of 8.5% is reported in unexplained stillbirths, with normal chromosomes and absent maternal, obstetrical cause and without congenital anomalies. Combining the cytogenetic data for this cohort, the combined diagnostic yield for a genetic etiology was 18%. Trio exome sequencing of fetus and parents could increase this yield by 3.7 to 8.1%.[7] In stillbirth cases, trio exome sequencing is reported to double the diagnostic yield compared to singleton ES and is therefore the recommended option for genomic testing. The presence of variants of uncertain significance (VUS) poses a challenge but does not detract from the overall utility of the technique in cases of unexplained stillbirth.

While exome sequencing can uncover genetic causes of stillbirth, it does not capture all potential etiologies, and non-genetic factors may still play a significant role. Placental and maternal factors could be interrelated with fetal factors in the causation of stillbirth and hence should be considered in combination.[8]

To summarize, the evaluation of each stillbirth mandates a **detailed** antenatal **history**, including teratogen exposure, preeclampsia and infection along with a 3-generation family history. Family counseling and consent for importance of **fetal autopsy** to include placental examination, fetal radiographs and detailed fetal external for dysmorphism, major and minor anomalies and fetal anthropometry. Internal examination with appropriate fetal organ histopathological examination. Detailed documentation and photographs are essential. Consultation with a

clinical geneticist enhances fetal autopsy outcomes and guides appropriate genetic testing. CMA is recommended in all cases except where a clinical diagnosis of a monogenic etiology is made. ES is recommended in chromosomally normal fetuses with congenital malformations. The role in unexplained fetuses without malformations is increasing to unravel cardiac disorders genes and those implicated in fetal development. The role of a **clinical geneticist** in the evaluation of the stillborn is important for appropriate phenotype-genotype correlation, novel candidate gene association with stillbirth, definitive diagnosis and appropriate genetic counseling.

Conclusions

Delivery of a stillborn is an extremely emotional experience for the family. Decision for fetal evaluation including consenting for an autopsy can be challenging. However, the later regret of an incomplete fetal evaluation at the time of the stillbirth, makes the knowledge of the process and utility of stillbirth workup an important component for the obstetrician. This hopefully would obviate the bottleneck in acceptance of fetal autopsy and ensure management as per standard recommendations.

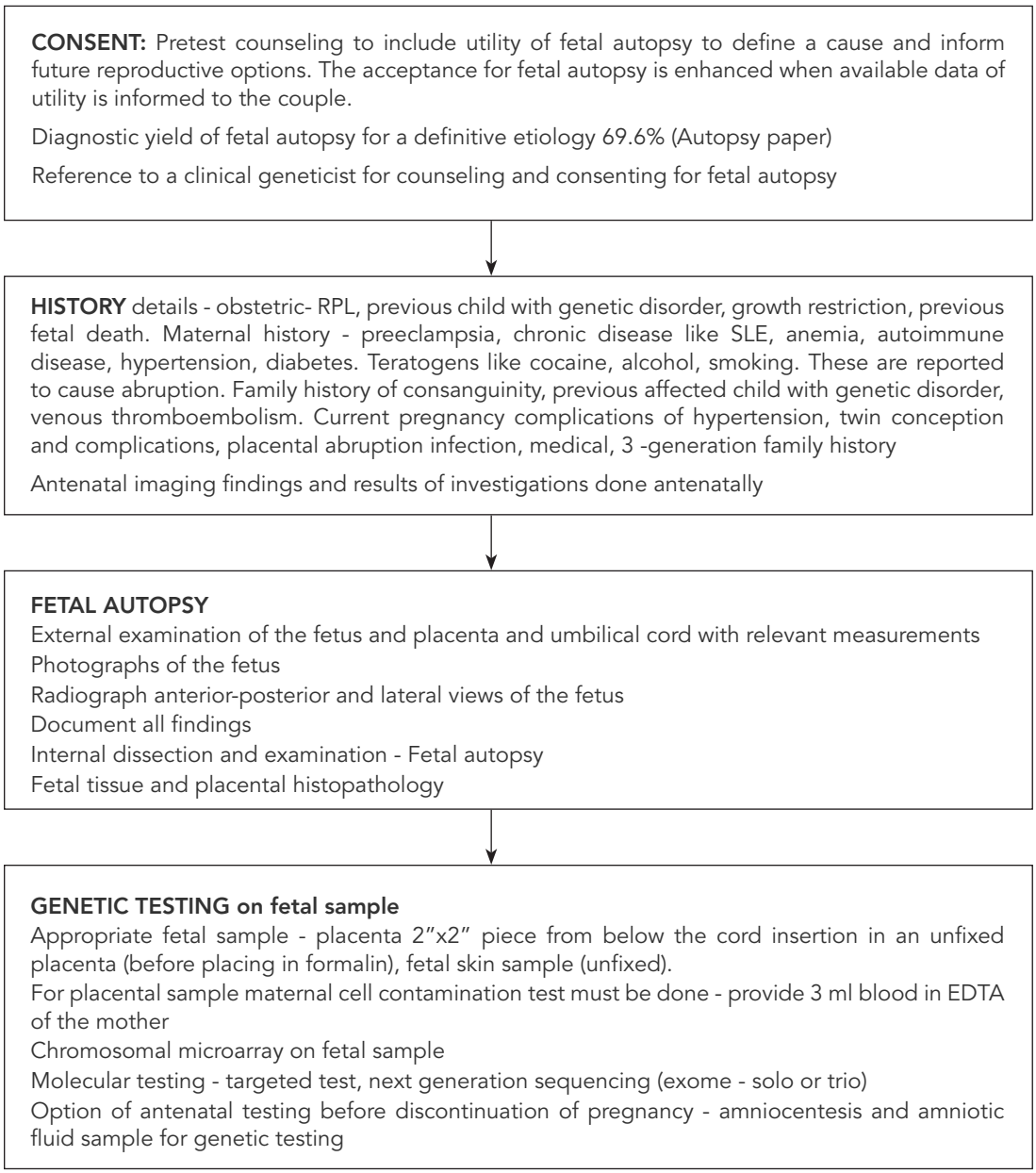


Figure 1: Stillbirth Evaluation for Definitive Etiology

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What Leads to an Unexplained Stillbirth?

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Introduction

Stillbirth is a devastating complication in pregnancy for patients and clinicians alike. In a recent publication using United Nations and World Health Organisation data, India had the highest number of total stillbirths in the year 2021 despite the fact that the annual stillbirth rate in our country has reduced from 30 per 1000 births in 2000 to 12 per 1000 births in 2021.[1] Stillbirth can occur due to a variety of maternal, fetal, placental, and environmental factors. Despite extensive investigations, 20–30% of stillbirths remain unexplained. Understanding the underlying causes is critical to develop preventive strategies for future pregnancies. This chapter aims to explore the possible etiologies for unexplained stillbirths.

Risk factors for intrauterine fetal demise and stillbirth

Several risk factors have been implicated in the etiology of stillbirth. These include the nonmodifiable causes like maternal preeclampsia, fetal growth restriction and the modifiable causes like maternal obesity (table 1).

Table 1: Risk factors for stillbirth[2]

Non-modifiable	Potentially modifiable
Nulliparity Maternal age <20 & >35 years Asian ethnicity Previous stillbirth Previous adverse pregnancy outcome Thrombophilia SLE, APLA, Renal disease Cholestasis Thyroid disease Multiple pregnancy Fetal growth restriction Advanced gestation > 41 weeks	Smoking Alcohol Illicit drug use Obesity Chronic hypertension Malnutrition Going to sleep supine

Unexplained stillbirth

Stillbirth is considered 'unexplained' when no known cause has been found after excluding the common etiologies including obstetric complications like fetal growth restriction, abruption, uncontrolled diabetes, fetal infections, congenital abnormalities and umbilical cord complications (table 2).[3] As per current recommendations, workup after a stillbirth should include thorough history, parental counselling, fetal autopsy, placental gross and histopathological examination, laboratory tests and genetic testing.[2,4] Despite an thorough evaluation, a high proportion of stillbirths may remain unexplained. Various papers estimate this proportion to vary between 25 to 60%.[3,4] These figures underline the gaping lack of knowledge in this field and the immense need for more research.

Table 2: Known Causes for stillbirth

Maternal	Fetal	Placenta & Cord
Obstetric complications Hypertensive disorders Medical complications of pregnancy	Fetal malformations Infections • CMV • Syphilis • Parvovirus	Abruption Chorioangioma Vasa praevia Velamentous cord insertion Umbilical cord thrombosis

Proposed workup following stillbirth

A broad outline of the proposed workup following a stillbirth is given in table 3. Maternal and fetal investigations need to eb tailored according to a through history and examination especially when testing for maternal infections and autoimmune disorders.

Table 3: Investigation following stillbirth[2,6-8]

Maternal	Fetal	Placenta & Cord
Detailed history CBC, LFT, KFT, CRP Bile acids Coagulation profile ICT & Kleihauer-Betke test Urine culture Vaginal & Cervical swab Blood culture (as indicated) Viral screen (as indicated) Blood sugar (random), HbA1c Thyroid function Thrombophilia screen Anti-Ro & anti - La antibodies Alloimmune antiplatelet antibodies Couple karyotype	External examination Infantogram/X Ray Autopsy Microscopy USG/CT/MRI (if autopsy declined) Fetal blood & swabs for microbiological examination as indicated Fetal tissue for cytogenetics: • QFPCR/FISH • Microarray • Whole exome sequencing (trio WES is ideal)	Gross examination • Retroplacental hematoma Histopathology (by trained pathologist) • Fetal vascular malperfusion lesions • Maternal vascular malperfusion lesions Inflammatory changes • Molecular changes • Confined placental mosaicism

Role of autopsy

Fetal autopsy is an essential component of workup following a stillbirth. It not only is helpful in confirming antenatally diagnosed malformations but also in diagnosing abnormalities that might have been revealed had the baby lived. Fetal autopsy ca also help in solving the puzzle of an apparently 'unexplained' stillbirth by finding out subtle congenital abnormalities.[5] An autopsy may also change the presumed etiology of a stillbirth, eg, a stillbirth that may be attributed to growth restriction may reveal an underlying coarctation or interrupted aortic arch that itself may have contributed to the growth restriction. Parents should be counselled regarding the importance of autopsy prior to the delivery of a stillborn fetus. If they still decline autopsy post birth, the options of a 'limited autopsy' or a 'virtual' autopsy must be given and discussed.

Infections as a cause of stillbirth

Transplacental infections that have been implicated in stillbirth are cytomegalovirus (CMV), parvovirus, rubella, toxoplasma and syphilis. These may remain undiagnosed unless specifically tested for as they may not be associated with any maternal symptom. Ascending infection with E coli, Klebsiella, Chlamydia with or without rupture of membranes can also lead to stillbirth. Malaria parasitemia is also associated with stillbirth but a through maternal history will help in diagnosing this infection as a cause. Delta variant of COVID 19 was specifically found to be associated with a high rate of stillbirth during the recent pandemic. Placental histopathology can provide evidence of infection if the findings show villitis, chorioamnionitis, or funisitis.

Role of placental histopathology

The placenta is a distinctive organ in which two circulations, ie, uteroplacental (from the mother to the fetus) and fetoplacental (from the fetus to the mother) are functioning in parallel with each other. The exchange of gases as well as nutrients occurs in the intervillous space without mixing of these two circulations. Thus evaluation of the placenta can provide invaluable information about both fetal and maternal causes of stillbirth. Placental histopathology is considered the most useful tool in investigation of an unexplained stillbirth.[7] The ACOG recommends that both gross as well as as histological examination of the placenta, umbilical cord and fetal membranes should be performed by a pathologist familiar with placental changes in stillbirth. The Amsterdam Placental Workshop Group consensus published a standard protocol in 2016 for placental evaluation.[8]

Role of genetic investigations

Conventionally genetic testing following a stillbirth was limited to karyotype. However, the value of karyotype is limited by its low resolution (it is unable to detect changes smaller than 5-10 Mb) and the high culture failure rates in dead cells. Thus genetic evaluation of stillbirth must be done by microarray (at the least) which has a resolution of 100-200 kb[9]. Also, CMA can be performed on DNA extracted from nonviable or macerated tissue as it does not need actively dividing cells. Performing CMA in place of conventional karyotype improved the detection rate by nearly 40%.[10] The addition of whole exome sequencing (WES) in today's era of genomics has opened the possibility of diagnosing single gene disorders as a cause of hitherto 'unexplained' stillbirth.[11] Increasing evidence

in emerging that pathogenic variants in genes associated with cardiomyopathies and cardiac channelopathies may play an important role in unexplained stillbirths, especially where all other known causes are absent.[12] Long QT syndrome (LQTS) is a known cause responsible for upto 9.5% cases of sudden infant death syndrome (SIDS). Carriers of LQTS gene have structurally normal hearts but they are at increased risk of syncope, seizures and sudden cardiac death. It is possible that similar life threatening arrythmias occur In utero resulting in a stillbirth. The use of WES in evaluation of unexplained stillbirth can provide more insight in these cases. Performing 'trio' exome, ie both parents as well as the fetal exome, is the most useful tool in identifying the actual pathogenic mutation responsible for the stillbirth.

Conclusion

Finding a possible cause for stillbirth is invaluable for both parents and clinicians as it can help finding an answer to the question, 'what went wrong?' and also in understanding the recurrence risk in subsequent pregnancies thereby guiding management and avoiding unnecessary interventions. A through postnatal evaluation including fetal autopsy, placental histopathology and the newer genetic techniques including microarray and trio-exome sequencing can provide answers to the 'unexplained' category of stillbirths. DNA storage helps in adopting a contingent approach to genetic testing for optimal utilization of resources.

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Medicolegal Aspects of Stillbirth and Handling Irate Relatives

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Introduction

Stillbirth is defined as the death of a fetus at or after 24 weeks of gestation, before or during delivery.[1] However, for international comparisons stillbirth is defined by WHO as a baby born with no sign of life at 28 weeks or more of gestation.[2]

The occurrence of stillbirth is a tragic event with profound emotional, psychological, and physical consequences for the parents, and it raises complex medicolegal issues. Obstetricians and gynecologists often face challenges not only in managing the medical aspects of stillbirth but also in dealing with the emotional distress of the family and potential legal implications.

Epidemiology and Causes of Stillbirth

Stillbirth remains a significant cause of perinatal morbidity and mortality worldwide. In 2021, the global stillbirth rate was 13.9 per 1,000 total births, equating to approximately 1.9 million stillbirths worldwide, though rates vary by region, socioeconomic status, and access to healthcare services.[3]

India has a stillbirth rate of approximately 12.2 per 1,000 total births, as reported for 2021.[4]

Traditionally the causes of stillbirth have been broadly classified into fetal, maternal, and placental categories. Fetal causes include genetic anomalies, infections, and fetal growth restriction. Maternal factors such as hypertension, diabetes, obesity, and infections contribute to stillbirth, while placental causes like placental abruption or previa can lead to impaired oxygenation and fetal demise.

Stillbirths are now being classified using the ICD-PM (International Classification of Diseases - Perinatal Mortality) which is a specialized classification system developed by the World Health Organization (WHO) to categorize and analyze perinatal deaths, including stillbirths. It provides a comprehensive framework for understanding the causes and contributing factors of stillbirth, by classifying stillbirths according to their underlying causes, such as maternal health conditions, fetal abnormalities, or complications during pregnancy or labor.[5]

However, in many cases, the exact cause remains unknown, despite thorough investigation, which complicates both medical management and legal considerations.

Medicolegal Aspects of Stillbirth

1. Documentation and Record Keeping

In the context of stillbirth, meticulous documentation is critical. Proper recording of maternal history, prenatal care visits, labor progress, fetal monitoring, and any interventions performed is essential. Failure to document these details can lead to complications in legal settings, especially if the parents pursue litigation. It is advisable to classify the cause of stillbirth as per the ICD-PM classification to maintain uniformity for data collection

The maternal history and records should include[6]

Demographic details	History of present pregnancy	Investigations done in current pregnancy	Past obstetric history	Family history
· Age · Socio-economic status · Consanguinity · Pre pregnancy BMI · Parity	· Whether booked or not · Number of antenatal visits · Singleton/ multiple · Concurrent condition: diabetes, hypertension · H/o itching over palms and soles · H/o leaking p/v or bleeding p/v · Perception of fetal movements	· Dating scan · Aneuploidy screening (PAPP-A) · Level 2 scan · Growth parameters · Doppler · Blood group · Viral markers · Glucose tolerance test · Hb electrophoresis	· H/o recurrent abortions · H/o FGR / pre-eclampsia/ stillbirth/ abruption	· H/o recurrent abortions · H/o familial disorders · H/o thromboembolism/ pulmonary embolism · H/o child born with congenital anomaly, abnormal karyotype or syndrome · H/o documented developmental delay in family
		Personal History	**Past medical history**	
		· H/o smoking/ substance abuse · H/o alcohol consumption	· H/o hypertension/ diabetes/ thrombophilia · H/o autoimmune disease · H/o anemia · H/o cyanotic heart disease · H/o epilepsy · h/o thromboembolic event	

The documentation of labor progress, method and frequency of fetal heart monitoring is of prime importance in cases of an intrapartum stillbirth. Whether fetal heart rate was documented at admission should always be recorded. The last antenatal visit prior to diagnosing fetal demise should be meticulously recorded too.

2. Examination of the Stillborn

The stillborn fetus should be promptly examined, noting dysmorphic features and measuring weight, length, and head circumference. Photographs of the whole body, including frontal and profile views of the face, extremities, and palms, as well as close-ups of any abnormalities, are essential for review and specialist consultation, especially if a geneticist is unavailable. Infantogram, should be offered, as it may reveal an unrecognized skeletal abnormality or further define a grossly apparent deformity. These must however be done after obtaining a written consent from the family.

3. Examination of placenta and cord

The gross and microscopic examination of the placenta, umbilical cord, and fetal membranes by a trained pathologist is the most important aspect of stillbirth evaluation. This assessment can reveal conditions like placental abruption, umbilical cord thrombosis, velamentous cord insertion, and vasa previa. It can also provide insights into infection, genetic abnormalities, and anemia. In cases of stillbirth in multifetal gestations, examining the placental vasculature and membranes is especially informative. Determining chorionicity and identifying vascular anastomoses are key components of the evaluation.

4. Fetal Autopsy

A postmortem or autopsy can provide valuable information about the cause of stillbirth, though its performance is often subject to legal and cultural considerations, particularly in India.

If the stillbirth is unexplained, performing a postmortem may help determine the underlying cause, such as genetic disorders, infections, or placental insufficiency. The results can also be crucial in defending against allegations of negligence or poor care.

In many cases, however, families may object to an autopsy on religious or personal grounds. While the decision to perform an autopsy should ideally be made in consultation with the family, it is important to ensure that the benefits of obtaining postmortem information are clearly communicated to them. Failure to seek informed consent or respect the family's wishes can exacerbate emotional distress and lead to legal consequences.

5. Fetal Laboratory tests

Genetic analysis is recommended for all stillbirths with parental consent. Karyotype or microarray testing is most effective when fetal abnormalities, growth issues, or anomalies are present. Microarrays provide more detailed results than karyotyping, detecting smaller abnormalities and uniparental disomy.

Optimal samples include amniotic fluid, placental tissue, or low-oxygen fetal tissues like costochondral cartilage. Amniocentesis offers the highest yield if delivery is not imminent. Providing patient history and discussing test costs are essential for accurate interpretation and informed decision-making.

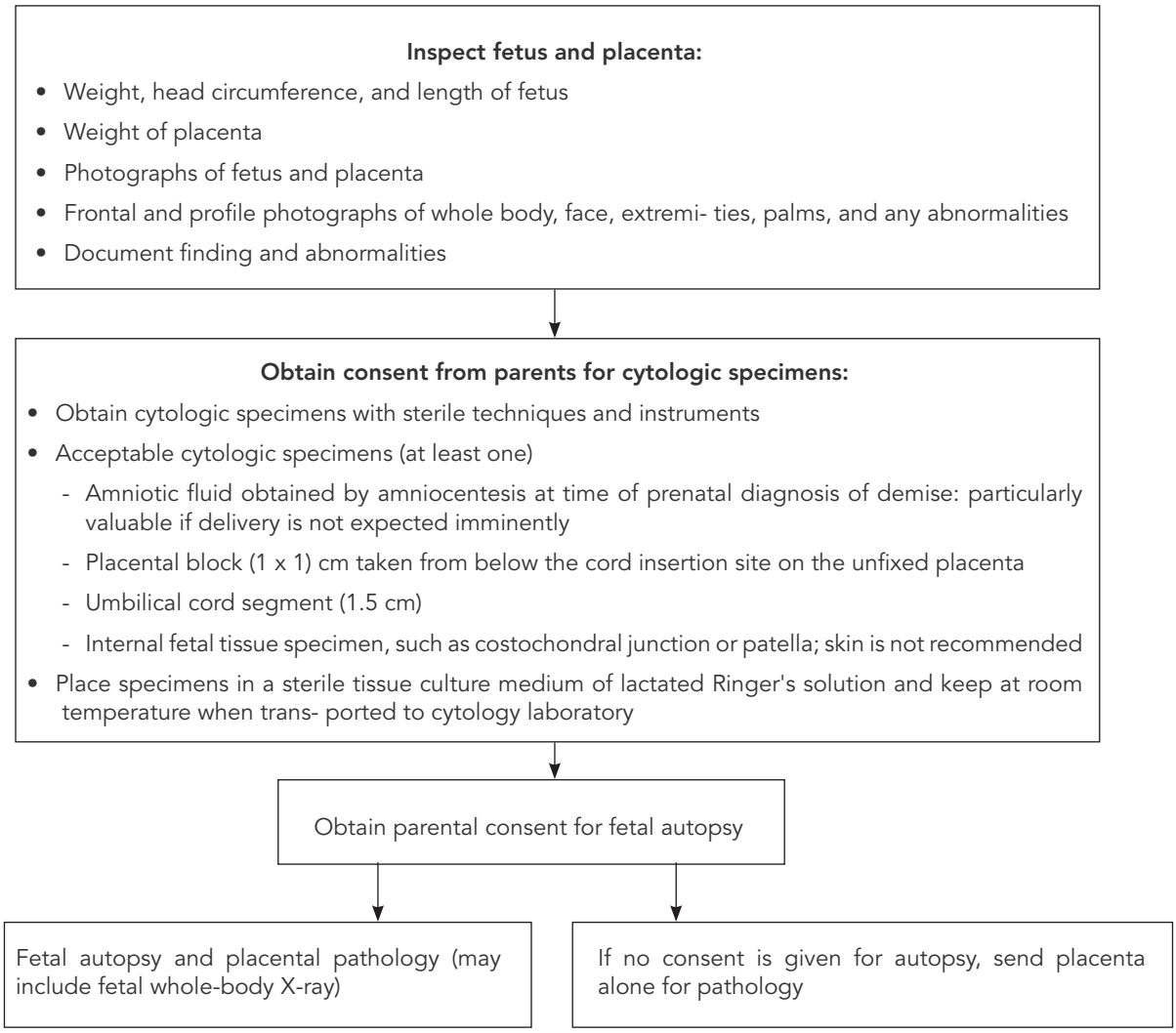

Figure. 1. Flow chart for fetal and placental evaluation

Tests like fetal photography, infantogram, autopsy etc should only be done a proper informed consent to avoid any litigation. Documentation of offering available tests as per the institution, and whether they were accepted by the family is important.

6. Registration of still births

In India, stillbirths must be registered under the **Registration of Births and Deaths Act, 1969,** making it a legal requirement. The **Stillbirth Reporting Form** records key details like the date, place, gestational age, parents' information, and medical cause of stillbirth (if known). It must be certified by a healthcare provider and submitted to the local registrar within 21 days.

This legal documentation supports public health data collection, policy-making, and parental access to benefits while ensuring compliance with the law. Yet, stillbirths are significantly underreported in India, despite legal mandates for registration. Improving awareness, training healthcare workers, and streamlining registration processes are essential to address this gap.

Handling Irate and Grieving Relatives

1. Initial Communication

When a stillbirth occurs, the immediate priority is to communicate the news to the family in a compassionate and professional manner. The healthcare provider should approach the situation with empathy, providing a quiet and private space for the conversation. The news should be delivered with sensitivity, avoiding medical jargon and giving the family time to process the information.

The physician should acknowledge the family's pain and sorrow and reassure them that they will be supported through the process. In India, where extended families are often involved in the decision-making process, it is important to ensure that all family members are informed in an appropriate and sensitive manner.

2. Managing Emotional Reactions

The emotional reaction of parents following stillbirth can vary from shock and disbelief to anger and grief. In some cases, family members may become irate or accuse the healthcare providers of causing the death. It is crucial for the healthcare provider to remain calm, professional, and non-defensive in such situations. The primary goal is to listen to the family's concerns, validate their feelings, and offer support.

A calm demeanor, active listening, and clear communication are key to managing these emotional reactions. In the face of anger or accusations, the healthcare provider should avoid becoming confrontational. Acknowledge the family's pain and emphasize the collaborative approach to understanding the cause of the stillbirth, if appropriate.

3. Providing Information and Support

In many cases, family members may want answers regarding the cause of the stillbirth. While some causes may be identifiable through medical investigations, others may remain unexplained. It is essential to provide honest and transparent information, even if the cause remains uncertain. Additionally, providing resources such as counseling, support groups, or spiritual care can be valuable in helping families cope with their loss.

4. Managing Legal Threats

In situations where relatives are threatening legal action, healthcare providers should adhere to the principle of transparency. It is important to explain the investigation process clearly and assure the family that every effort is being made to understand the cause of the stillbirth. If a formal complaint is made, the provider should cooperate with the medical board or legal authorities and ensure that all relevant documentation is available.

Consulting with hospital legal counsel may also be necessary to navigate the complexities of the situation. In some cases, a mediator or counselor may be helpful in diffusing tensions and addressing concerns.

5. Cultural Sensitivity and Compassionate Care

India is a country with diverse cultural and religious beliefs, and these can influence how families cope with stillbirth. Healthcare providers must be aware of the cultural nuances that may affect the grieving process and be respectful of the family's traditions. Offering culturally appropriate care and support, whether through religious rituals, community involvement, or simply respecting the family's wishes for privacy, is essential.

Conclusion

A standard definition for classifying stillbirths and documenting their causes is needed to implement effective interventions. State-specific strategies should address varying stillbirth rates across India. Stillbirth audits must be institutionalized as part

of continuous quality improvement to ensure local accountability and reduce rates. Healthcare providers should be trained to offer bereavement support to affected families. These efforts should also be integrated into the primary healthcare system.[7]

Stillbirth is a deeply traumatic event for families, and healthcare providers must navigate the complex medicolegal aspects surrounding it with professionalism, empathy, and clarity. Effective communication, proper documentation, and adherence to the standard of care are essential in minimizing legal risks. At the same time, healthcare providers must offer compassionate support to grieving families, managing emotional reactions and providing information in a transparent and sensitive manner. By understanding both the medical and emotional dimensions of stillbirth, obstetricians and gynecologists can better serve their patients and reduce the risk of legal conflicts.

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DEBATE
The Dilemma of when to Deliver an Uncomplicated Pregnancy
Elective delivery at 39 weeks

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Introduction

Induction of labor (IOL) is a common obstetric intervention that stimulates the onset of labor using artificial methods.[1] There is substantial variation in IOL rates worldwide, and this can be attributed to variability in the guidelines and lack of consensus on the clinical practice guidelines on IOL. In developed countries, the proportion of neonates born following IOL is estimated to be approximately 25%. Indications for IOL depend on a patient's obstetrical and medical history. IOL is indicated when it is thought that the outcomes for the fetus, the mother, or both are better than with expectant management, that is, waiting for the spontaneous onset of labor.[2]

Indications of IOL

Indications for late preterm, early term, late-term, and post-term delivery timing depend on a patient's obstetrical and medical history. The American College of Obstetricians and Gynecologists (ACOG) has an extensive list of recommendations on delivery timing, with some of the more common clinical scenarios listed below.[3]

- Oligohydramnios with the timing at 36 0/7 to 37 6/7 weeks of gestation
- Fetal intrauterine growth restriction, with no abnormal Doppler, with the timing at 38 0/7 to 39 6/7 weeks of gestation
- Fetal intrauterine growth restriction, with absent end-diastolic flow, with the timing at 34 0/7 weeks of gestation
- Fetal intrauterine growth restriction, with reversed end-diastolic flow, with the timing at 32 0/7 weeks of gestation
- Chronic hypertension, not on medications, with the timing at 38 0/7 to 39 6/7 weeks of gestation
- Gestational hypertension with the timing at 37 0/7 weeks of gestation or at the time of diagnosis if diagnosed later
- Preeclampsia without severe features with the timing at 37 0/7 weeks of gestation or at the time of diagnosis if diagnosed later
- Preeclampsia with severe features with the timing at 34 0/7 weeks of gestation or at the time of diagnosis if diagnosed later
- Pregestational diabetes is well-controlled, with the timing at 39 0/7 to 39 6/7 weeks of gestation
- Gestational diabetes, diet, or exercise controlled, with the timing at 39 0/7 to 40 6/7 weeks of gestation
- Preterm prelabor rupture of membranes with the timing at 34 0/7 weeks of gestation or at the time of diagnosis if diagnosed laterLate-term with the timing at 41 0/7 to 41 6/7 weeks of gestation
- Abruptio placentae
- Chorioamnionitis
- Intrauterine fetal demise

Labor may also be induced for logistic reasons, such as the risk of rapid labor, distance from the hospital, or psychosocial indications. In such circumstances, fetal lung maturity should be established.

Methods Of Induction[2]

Two primary methods of IOL are mechanical and pharmacological. Cervical ripening agents are utilized primarily when the Bishop score is unfavorable (less than 8).

Mechanical methods: Cervical ripening can be done using a Foley catheter or double-balloon device (ie, Cook catheter) placed through the endocervical canal[4]. Osmotic dilators, laminaria, and synthetic dilators are also used for cervical ripening and are placed in the cervical os.

Pharmacological methods: Pharmacological forms of IOL include synthetic prostaglandins and synthetic oxytocin. Prostaglandins are used for cervical ripening. Misoprostol, prostaglandin E1 (PGE1), and dinoprostone, prostaglandin E2 (PGE2), are used in various doses and routes of administration. Oxytocin is administered intravenously in varying dosing regimens.

Amniotomy is often used with mechanical and pharmacological labor induction methods.

When to Induce

The American College of Obstetricians and Gynecologists (ACOG) has an extensive list of recommendations on delivery timing. Labor may also be induced for logistic reasons, such as the risk of rapid labor, distance from the hospital, or psychosocial indications. In such circumstances, fetal lung maturity should be established. Many debates and trails are going on throughout world to decide the timings of IOL in low risk women. With the advent of ARRIVE trail[5], perceptions regarding early IOL at or after 39 weeks are beginning to change. Various randomized trails are ongoing to support the notion of early IOL.

Various Trails

Arrive Trial

Data for the ARRIVE trial study was collected between March 2014 and August 2017, and the study was published in August 2018 by Grobman et al.[5]

Why did researchers conduct the ARRIVE trial?

Researchers conducted the ARRIVE trial for a couple of key reasons:

1. **Uncertainty about Cesarean Risk:** There was ongoing debate among U.S. obstetricians about whether elective induction of labor at 39 weeks increased the risk of Cesarean sections. The ARRIVE trial aimed to provide clearer evidence on this matter.
2. **Reducing Stillbirth Risk:** Another goal was to determine if elective inductions at 39 weeks could reduce the risk of stillbirth. By inducing labor earlier, researchers hoped to lower the chances of stillbirth that might occur if the pregnancy continued beyond 39 weeks.

Overall, the trial sought to provide more definitive answers to these important questions, helping to guide better decision-making in obstetric care.

Who was in the study?

The ARRIVE trial was conducted at 41 hospitals in the United States, all part of the Maternal-Fetal Medicine Units Network with the National Institute of Child Health and Development (NICHD). Here's a breakdown of who was involved in the study:

- **Screening:** Over 50,000 patients were screened to determine eligibility.
- **Participants:** The trial included participants who were giving birth for the first time with a single, cephalic (head-down) baby and no major medical conditions (considered "low risk"). They needed to be eligible for a vaginal birth and medically eligible to wait until at least 40 weeks and 5 days before giving birth.
- **Random Assignment:** 3,062 participants were randomly assigned to the elective induction group, and 3,044 were assigned to the expectant management group. Both groups had similar backgrounds.
    - **Elective Induction Group:** Participants had labor induced between 39 weeks 0 days and 39 weeks 4 days. Baby's heart rate was monitored throughout induction and labor using either continuous or intermittent methods.
    - **Expectant Management Group:** Participants were expected to have weekly follow-up visits with their care provider and to continue their pregnancy until at least 40 weeks and 5 days, unless there was a medical reason to induce labor earlier.

This study setup helped ensure a controlled comparison between the outcomes of elective induction at 39 weeks and expectant management.

Health Outcomes in the Study

The specific outcomes they included in this composite were:

- Stillbirth or newborn death (death of a baby

before labor, during labor, or after birth during the delivery hospital stay)

- Intubation or other intensive respiratory support needed by the newborn
- An Apgar score of newborns at 3 and 5 minutes
- Brain swelling
- Seizures
- Sepsis (an extreme response by the body to a blood infection)
- Pneumonia
- Meconium aspiration syndrome
- Birth trauma
- Bleeding within the scalp, skull, and/or brain
- Low blood pressure requiring intensive fluids and medications.

As a secondary outcome, the authors were interested in the impact of elective inductions on Cesarean rates, other outcomes for birthing people, like pregnancy-related high blood pressure, the length of time spent in labor and hospital stay, and rates of operative vaginal delivery (with forceps or vacuum), chorioamnionitis, perineal tears, postpartum hemorrhage, postpartum infection, and maternal admission to the intensive care unit (ICU).

Impact on newborn outcomes:

The ARRIVE trial, which investigated the effects of electively inducing labor at 39 weeks, concluded that it did not significantly impact the primary composite outcome of death or serious complications for babies. When looking at individual outcomes for the entire group, a small percentage of newborns (7%) required respiratory support after birth, but no other differences were noted between the induced labor group and the control group. This included no differences in stillbirth rates, newborn deaths, NICU admissions, infections, seizures, or birth trauma.

Impact on Cesarean rates:

It's fascinating how the ARRIVE trial highlighted another significant finding: elective induction at 39 weeks indeed resulted in a lower Cesarean rate. Specifically, the rate was 18.6% in the induction group compared to 22.2% in the expectant management group, and this difference was statistically significant.

This information could be quite beneficial for expectant mothers and healthcare providers when considering the timing of labor induction. Balancing the benefits and risks of induction and Cesarean delivery is essential for making informed decisions..

Impact on pregnancy-related blood pressure:

Elective induction at 39 weeks also reduced the incidence of pregnancy-related high blood pressure, with only 9% in the elective induction group compared to 14% in the expectant management group.

Impact on the length of hospital stay:

While birthing individuals in the elective induction group spent more time in labor at the hospital, they experienced a shorter postpartum hospital stay compared to those in the expectant management group.

Impact on other maternal outcomes:

The study found no significant differences between the elective induction group and the expectant management group in terms of outcomes like operative vaginal delivery (using forceps or vacuum), chorioamnionitis, perineal tears, postpartum hemorrhage, postpartum infection, or maternal ICU admission.

Limitations and criticisms of the ARRIVE trial:

The ARRIVE trial certainly offers valuable insights, but like any study, it does have its limitations and criticisms:

- **Selection Bias:** Participants who chose to participate might differ from those who did not, potentially impacting the study's generalizability.
- **Representation:** The study participants may not accurately reflect the broader population of birthing individuals.
- **Care Providers:** Most participants received care from physicians, lacking the midwifery perspective, which could influence outcomes and findings.
- The Cesarean rate achieved in the study might not reflect real-world practice or what is done in other types of hospitals.

ELITE-39 trial[6]

The ELITE-39 trial conducted in India explored the effects of elective induction of labor at 39 weeks compared to expectant management among low-risk nulliparous pregnant women. Here are the key findings from the study:

- **Cesarean Section Rate:** The rate was 17.3% in the elective induction group (31/179) versus 25% in the expectant management group (45/180). However, this difference was not statistically significant (P = 0.08).
- **Delivery Timing:** The majority of women (70%, n = 126) delivered between 39 and 40 weeks, with only 2.8% (n = 5) delivering after 41 weeks.
- **Induction Rates in Expectant Management (EM) Group:**
  - At 39–40 weeks: 19% (n = 24)
  - At 40–41 weeks: 59.2% (n = 29)
  - At 41+1–42+2 weeks: 80% (n = 4)
- The frequency of intrapartum fever, postpartum hemorrhage, anal sphincter injury and puerperal pyrexia was not found to be significantly different between the groups.
- Elective induction of low-risk nulliparous women at 39 weeks was not associated with increased cesarean section rate. The maternal and perinatal outcomes were comparable

These results provide valuable insights into the outcomes of elective induction at 39 weeks in a different population and setting, adding to the broader understanding of the implications of such interventions.

What does the evidence say about elective induction at 39 weeks in a post-ARRIVE world?

➢ **Nethery (2023)[7]**

Nethery's 2023 study compared rates before and after the ARRIVE trial to assess the impact of elective induction at 39 weeks on various outcomes. Here are some key findings:

- **Overall Induction Rate:** The rate of induction increased from 35% pre-ARRIVE (January 2016 – July 2018) to 43% post-ARRIVE (August 2018 – December 2020).
- **Unplanned Cesarean Births:** There were no significant differences in the rates of unplanned Cesarean births, with 27% pre-ARRIVE and 26% post-ARRIVE.
- **Hypertensive Disorders of Pregnancy:** Rates of hypertensive disorders (pre-eclampsia, eclampsia) remained unchanged.
- **NICU Admissions:** There were no differences in NICU admission rates between the two periods.

These findings suggest that while elective induction rates increased post-ARRIVE, it did not lead to significant changes in unplanned Cesarean births, hypertensive disorders, or NICU admissions.

➢ **Wood (2023)[8]**

Wood's 2023 study compared rates before and after the ARRIVE trial, providing some interesting insights:

- **Pre-ARRIVE Group:** Included 2,860,942 births from January 2016 to July 2018.
- **Post-ARRIVE Group:** Included 971,343 births from November 2018 to March 2020.
- **39-Week Induction Rates:** There was an immediate increase in the rate of 39-week inductions post-ARRIVE, rising to 15.0% compared to the expected 13.8%.
- **Cesarean Rates:** Cesarean rates decreased over time, from 25.1% pre-ARRIVE to 24.7% post-ARRIVE.

These findings suggest that the ARRIVE trial had a noticeable impact on obstetric practices, particularly increasing the rate of elective inductions at 39 weeks and slightly reducing Cesarean rates.

➢ **Atwani (2024)9**

Atwani's 2024 study provides further insights into the effects of the ARRIVE trial, specifically focusing on participants grouped by BMI:

- **Pre-ARRIVE Group:** Included 1,087,832 births from August 2016 to July 2018.
- **Post-ARRIVE Group:** Included 1,038,435 births from January 2019 to December 2020.
- **Induction Rates:** Overall rate of inductions and inductions at 39 weeks increased for both groups of birthing individuals.
- **Cesarean Risk:** The relative risk of Cesarean decreased by 2% for those with a BMI < 40, but did not change for those with a BMI > 40.

These findings highlight the influence of BMI on Cesarean rates and induction practices post-ARRIVE trial, offering valuable insights for personalized obstetric care.

➢ **Gilroy (2022)[10]**

Gilroy's 2022 study presents several findings related to the impact of the ARRIVE trial:

- **Induction Rates:** The rate of induction at or beyond 39 weeks increased from 30% pre-ARRIVE to 36% post-ARRIVE.
- **Cesarean Rates:** There was a slight decrease in Cesarean rates, from 27.9% pre-ARRIVE to 27.3% post-ARRIVE.

- **Maternal ICU Admissions:** Birthing individuals in the post-ARRIVE group were slightly more likely to be admitted to the maternal ICU (0.09% versus 0.08%).
- **Infant Respiratory Support:** Infants in the post-ARRIVE group were more likely to need immediate assisted breathing support (3.5% versus 2.8%).

It showed that birthing individuals in the post-ARRIVE group had a slightly higher likelihood of being admitted to the maternal ICU (0.09% vs. 0.08%) and of having infants who required immediate assisted breathing support (3.5% vs. 2.8%).

These findings highlight some trade-offs associated with the changes in induction practices following the ARRIVE trial. It's valuable to consider these outcomes when making decisions about labor and delivery

➢ **Futterman (2023)[11]**

Futterman's 2023 study provided additional insights into the impact of the ARRIVE trial on pregnancy-related high blood pressure. The findings indicated that the incidence of pregnancy-related high blood pressure decreased among those induced at 39 weeks, from 14.7% pre-ARRIVE to 14.1% post-ARRIVE. Moreover, this decrease continued gradually each year.

➢ This highlights another potential benefit of elective induction at 39 weeks, contributing to an overall reduction in pregnancy-related hypertension

➢ **Langen (2023)[12]**

Langen's 2023 study offers a nuanced perspective on the outcomes of elective induction at 39 weeks:

- **Unmatched Analysis:**
  - **Cesarean Rates:** Higher in the elective induction group (30.1% vs. 23.6%).
  - **Labor Duration:** Longer for the elective induction group (25 hours vs. 16 hours).
  - **Postpartum Hemorrhage:** Slightly higher rates in the elective induction group (10.1% vs. 8.3%).
  - **Forceps/Vacuum-Assisted Births:** Higher in the elective induction group (11.4% vs. 9.3%).
  - **Shoulder Dystocia:** Slightly higher in the elective induction group (4.1% vs. 3.0%).
- **Matched Analysis:**
  - **Cesarean Rates:** No significant differences between groups.
  - **Labor Duration:** Longer for those who were induced (24.7 hours vs. 20.1 hours).
  - **Shoulder Dystocia:** Slightly higher rates in the elective induction group (4.1% vs. 2.5%).
  - **Birthweights:** Slightly higher in the expectant management group (3,493 grams vs. 3,429 grams).

These findings shed light on the complexities and trade-offs associated with elective induction at 39 weeks. Balancing these factors can be crucial for making informed decisions about labor and delivery.

➢ **Muller (2023)13**

Muller's 2023 study, using data from the National Health Service (NHS) in England, provides significant insights into the outcomes of elective induction at 39 weeks versus expectant management:

- **Primary Outcome:** The primary outcome combined stillbirth, neonatal death (within 28 days of birth), and 15 other diagnoses or 7 procedures associated with hospitalization and death in the first year after birth.
- **Risk of Death and Severe Health Issues:** The risk was lower in the induction group (3.28% vs. 3.64%).
- **Stillbirth Risk:** Lower in the induction group (0.01% vs. 0.07%).
- **Newborn Death Risk:** Higher in the induction group (0.10% vs. 0.04%).

These findings highlight the complex trade-offs associated with elective induction at 39 weeks. While the induction group showed a lower risk of stillbirth and overall severe health issues, there was a higher risk of newborn death.

Impacts of embracing 39-week elective induction:

The impacts of embracing 39-week elective induction, especially following the ARRIVE trial, are quite extensive:

- **Increase in Induction Rates:** Elective induction of labor (IOL) among low-risk nulliparas at ≥39 weeks gestation increased in the U.S. from 30.2% to 36.1%.
- **Cesarean Delivery Rates:** No significant change in the rate of cesarean deliveries, either overall or within subgroups of low-risk, ≥39-week nulliparas or low-risk, ≥39-week multiparas.
- **Timing and Administration:** No differences in the timing of administration of the initial cervical

ripening agent or in the proportion of planned cesareans for patients not presenting for labor or spontaneous rupture of membranes (SROM).

- **Broad Access:** Allowing elective 39-week IOL in an unrestricted manner enabled more patients beyond low-risk nulliparas to choose this option.
- **Consistent Findings:** The lower rate of cesarean deliveries in low risk nulliparas randomized to IOL was corroborated by meta-analyses of randomized trials and cohort studies.
- **Adverse Neonatal Outcomes:** No change in adverse neonatal outcomes with the liberal use of a 39-week IOL policy, aligning with previous studies.
- **Vaginal Birth and Morbidity:** No difference in vaginal birth rates or morbidity after liberalizing 39-week IOL.
- **Logistical Considerations:** The feasibility of offering elective induction at 39 weeks largely depends on the capacity, bed space, and staffing of the labor and delivery unit.

These insights reflect how the ARRIVE trial influenced labor induction practices and highlight the broader considerations involved in adopting such policies

Conclusion

The ARRIVE trial suggests that elective induction at 39 weeks can reduce Cesarean section rates and the incidence of pregnancy-related hypertension without adversely affecting neonatal outcomes. However, individual factors such as maternal preference, health conditions, and prior obstetric history must be considered when deciding on the timing of IOL. The post-ARRIVE data confirm that elective IOL at 39 weeks is generally safe and does not lead to significant increases in cesarean sections or adverse neonatal outcomes. However, it is associated with longer labours, and slightly higher rates of shoulder dystocia and postpartum haemorrhage.

The increasing rate of elective IOL at 39 weeks reflects growing acceptance, but clinicians should continue to balance the benefits with the capacity of their institution and individual patient factors Further research is necessary to refine the recommendations and balance the benefits and risks of early induction in low-risk pregnancies.

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DEBATE
The Dilemma of when to Deliver an Uncomplicated Pregnancy
Elective delivery at 39 weeks
Against the Motion

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The "A Randomized Trial of Induction Versus Expectant Management" trial (ARRIVE trial) published in 2018 suggested that induction of labor can be considered a "reasonable option" for low-risk nulliparous women at ≥39 weeks of gestation. The study results led some professional societies to endorse the option for elective induction of labor at 39 weeks of gestation in low-risk nulliparas, and this has begun to change obstetrical practice. The ARRIVE trial provided valuable information supporting the benefits of induction of labor; however, the trial is insufficient to serve as the primary justification for widespread elective induction of labor at 39 weeks of gestation in low-risk nulliparas because of concerns about external validity.

Routine induction of labor at 39 weeks gestation has been proposed as a strategy to reduce the risk of stillbirths. However, this approach raises several concerns regarding its necessity, efficacy, and potential risks. This essay argues against the routine induction of labor at 39 weeks for uncomplicated pregnancies, highlighting the need to balance benefits with potential harms and individualize care.

Lack of Necessity for Routine Induction

The primary rationale for routine induction at 39 weeks is to prevent stillbirths. However, the overall risk of stillbirth at this gestational age remains relatively low. According to various studies, the risk of stillbirth increases slightly beyond 40 weeks, but the absolute risk at 39 weeks is minimal. The risk of stillbirth at 39 weeks in uncomplicated pregnancies is relatively low but does increase slightly as gestation advances. According to a systematic review and meta-analysis published in **PLOS Medicine**, the risk of stillbirth at 39 weeks is approximately **0.11 per 1,000 pregnancies**. This risk increases to about **3.18 per 1,000 pregnancies** by 42 weeks. Inducing labor routinely for all women at 39 weeks may not be justified given the low incidence of stillbirths at this stage, especially when individual risk factors are not taken into account.

Potential for Increased Medical Interventions

More women are being exposed to the disadvantages and discomfort of induction of labor worldwide, while their risk of antepartum stillbirth is very low. Induction of labor reduces women's choices in care provider and birth place, restricts mobility and is generally experienced as being more painful than labor with a spontaneous onset. Women who are induced use more pharmacological pain relief additional pain management, such as epidurals than they intended, with associated potential harms for themselves and their fetus. Furthermore, induction of labor increases the risk of complications of labor and delivery, including uterine hyperstimulation, uterine rupture, perineal lacerations, severe postpartum hemorrhage, and uterine prolapse. These adverse clinical outcomes contribute to a negative birth experience.

Impact on Maternal and Fetal Outcomes

While the intention behind routine induction is to improve neonatal outcomes, it may inadvertently lead to adverse maternal and fetal outcomes. Induction of labor can result in increased stress for both the mother and the fetus, potentially leading to complications such as fetal distress and hypoxia. These interventions can, in turn, increase the likelihood of instrumental deliveries (e.g., forceps or vacuum extraction) and cesarean sections. The risks associated with these interventions, including infection, hemorrhage, and longer recovery times, must be weighed against the potential benefits of preventing a rare stillbirth. A personalized approach, considering the specific health status and preferences of the mother, may be more beneficial than a one-size-fits-all strategy.

Ethical Considerations

The decision to induce labor at 39 weeks should respect maternal autonomy and involve shared decision-making between the healthcare provider and the pregnant individual. It is crucial to weigh the benefits and risks in the context of each patient's unique circumstances. For example, while a healthy individual with no comorbidities might prefer expectant management, another may value the predictability and reduced risk profile of induction.The implementation of routine induction should also be equitable, ensuring that access to care is not influenced by socioeconomic disparities. Policymakers and healthcare providers must carefully balance the population-level benefits of reduced adverse outcomes against the individual's right to choose their care pathway.

Too much, too soon

Interventions during childbirth are crucial for preventing mortality and other adverse outcomes. However, safety is not limited to clinical outcomes. Psychosocial factors are also very important for women to feel safe. Ignoring this can have unintended consequences. For example, studies indicate that the care provider's pressure to induce labor is one of the reasons women avoid mainstream systems of birth care and choose to have unattended births or high risk homebirths, or travel long distances to avoid interventions. The majority of women highly value a positive birth experience and to give birth without medical interventions.

The perinatal mortality rate has decreased substantially in the past century. On the other hand, the rate of many childbirth interventions, including induction of labor, is rising. After the 'point of optimality' an increase in the use of interventions will lead to more harm than benefits at a population level. Interventions are potentially harmful and costly when used inappropriately or routinely.

The Lancet Series on Maternal Health identifies high rates of induction of labor as care that is provided "too much, too soon". Experts at the World Health Organization and authors of the Lancet Series on Caesarean Section, have recently also warned against excessive use of obstetric interventions. Inducing women to prevent small absolute risks based on trials undertaken with very discrete populations neglects these warnings. Besides, a small increase in absolute risk does not necessarily mean that outcomes will be improved if labor is induced. Without the full picture of longer term outcomes from single and multiple cumulative interventions, and in the absence of a clear understanding of the compiled morbidity that may eventuate over a woman's life time of reproduction, it is not possible to achieve fully informed judgements.

Limited resources

An associated unintended consequence of overuse of induction of labor is the pressure put on health care resources, which are already constrained. Overuse of interventions for women at very marginal risk of adverse outcomes will reduce the availability of resources for those with high-risk factors and complications, and for prevention. It also limits resources for the implementation of evidence-based non-medical interventions, such as continuous support during labor, which has been shown to reduce the rate of caesarean section by 25%, and a low five-minute Apgar score by 38%, and may therefore also reduce perinatal mortality and morbidity if implemented on a large scale. Continuous labor support is also more likely to be associated with spontaneous vaginal birth, less need for pharmacological pain relief, shorter labors, and fewer women reporting a negative childbirth experience.

Alternatives to Routine Induction

Instead of routine induction, a more balanced approach would involve close monitoring of pregnancies that extend beyond 39 weeks, with individualized assessment of risk factors. Non-invasive methods, such as fetal movement monitoring and ultrasound assessments of amniotic fluid levels, can help identify pregnancies at higher risk of stillbirth without resorting to immediate induction. This approach ensures that interventions are reserved for those who truly need them, thereby

minimizing unnecessary medical interventions and their associated risks.

Conclusion

In conclusion, routine induction of labor at 39 weeks for uncomplicated pregnancies to prevent stillbirths is not warranted given the low incidence of stillbirths at this gestational age, the potential for increased medical interventions, and the risk of adverse maternal and fetal outcomes. A more nuanced approach that involves individualized risk assessment and close monitoring is essential. This strategy respects patient autonomy, reduces unnecessary medical interventions, and ensures that healthcare resources are used effectively. By adopting a personalized and evidence-based approach, healthcare providers can better support the health and well-being of both mothers and babies.

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Spontaneous Rupture of a Mature Ovarian Cystic Teratoma: A Rare Case Report

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INTRODUCTION

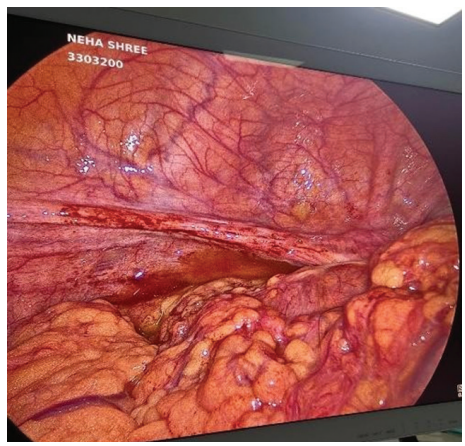
Dermoid cyst commonly known as mature cystic teratoma is a well differentiated germ cell tumours comprising of all the three germ cell layers.[1] Majority of them are unilateral but may have bilateral presentation in 10-15% of the cases. It can undergo malignant transformation in 0.1- 0.2% of cases. One of rarest complication reported in literature includes spontaneous rupture of dermoid. Unlike other germ cell neoplasms, dermoid cysts can occur at any age.' Still, these tumours are more prevalent in reproductive age group accounting for 70% of all benign ovarian neoplasms.[1] Dermoid cysts are slow growing tumours and are often asymptomatic. However, asymptomatic patients can possibly become symptomatic when the tumour reaches a considerable size or is bilateral and the most common symptom is lower abdominal pain and abdominal fullness.? Clinical assessment is difficult hence ultrasound (USG) helps in establishing the diagnosis. USG along with Magnetic Resonance Imaging (MRI) gives additional information regarding the tumour size, location, number and nature of lesion in relation to the surrounding structures. We present this case because of its unusual presentation as spontaneous rupture of dermoid cyst. Identifying ovarian cyst is very crucial in women of reproductive age group due to the fear from sterility.

CASE REPORT

We report a case of 31-year-old P1L1 female, who developed chemical peritonitis resulting from a spontaneous intraperitoneal rupture of a dermoid cyst.

She presented to opd with complaint of pain lower abdomen along with abdominal distention, fever, and gastrointestinal disturbances such an anorexia, nausea, vomiting, and diarrhoea. On per abdominal examination guarding was present along with tenderness in right iliac fossa. On per vaginal examination: Uterus anteverted with normal size, left fornix free, a vague mass of 10x15 cm was felt in right fornix with restricted mobility.

USG and MRI done was suggestive of right ruptured dermoid cyst. After adequate counselling laparoscopy was planned. Intraoperative findings: Yellowish fluid in pelvic cavity of around 400 cc with hair Shaft floating freely ,Uterus and adnexae was covered with omental adhesions , adhesiolysis was done followed by right salpingo-oophorectomy and sample was retrieved in endobag through 10 mm port.



Extensive peritoneal lavage was done and pelvic drain was placed in situ Histological examination showed right mature dermoid cysts. The section of the right cystic ovary revealed accumulation of various mature tissues such as adipose, muscle tissue, mucous gland, cartilage, hair folicules with focal wall lymphoplasmocitic infliltration, and foreign body giant cells.

The ascitic fluid cytology was negative for bacteria.

Antibiotic therapy with Inj supacef 1.5 g I/V every 12 h and inj Metronidazol 500 mg I/V every 8 h for 5 days, was given, and prophylaxis of thrombembolism was administered.

The postoperative course was uneventful. The patient was discharged on the fifth postoperative day and sent for further outpatient observation.

Discussion

The actual meaning of the word teratoma or dermoid is 'monster' and was derived from the Greek word 'teratomas' and was first mentioned by Virchow in 1863.8 The most common teratomas is sacro-coccygeal (57%) followed by mediastina (3%). In gonads, the most common location is ovarian followed by testis. Ovarian teratoma Is a common tumour which account for 20% of adult tumours and 50% of paediatric tumours.[1] They are well differentiated` tumours and arise from germ cells which comprise of endoderm, mesoderm and ectoderm. It is common to see macroscopic teeth, hair, skin elements, sebaceous and foul smelling material within the cyst. It is commonly seen in women less than 30 years of age."

They are mostly asymptomatic and are incidentally detected on ultrasound. The symptoms ary according to the size of the cyst. When symptomatic, they present with lower abdominal pain.4 Other symptoms include dysmenorrhoea, abdominal pressure, bloating, a palpable abdominal mass,pressure symptoms like bladder disturbances and gastrointestinal complaints. 12 Ultrasound is the preferred modality of imaging. Typically ovarian dermoid on ultrasound appears as unilocular cystic adnexal mass with partially or diffusely echogenic mass with posterior acoustic shadowing, It may also show tip of iceberg' sign which comprise of partial or diffuse echogenic mass and usually demonstrates sound attenuation or shadowing due to the presence of sebaceous material and hair within the cyst.'3 Hyper echoic Rokitansky nodules and presence of fluid- fluid levels which represent sebaceous material floating on fluid may be seen. CT scan can be good option to detect ovarian a dermoid in young girls especially where dermoid cyst is comprised of fluid-fluid or fat-fluid levels. Fat along with bones and teeth are well seen on CT as compared to ultrasound.

MRI can detect ovarian dermoid with a sensitivity of 100% and specificity of 99%. Therefore it is particularly useful during pre- operative work up a patient prior to surgery.' It gives additional information regarding the tumour size, location, number and nature of lesion in relation to the surrounding structures. Laboratory tests include tumour markers like CA-125 and CA-19-9, Studies have shown elevated levels of CA 19-9 in 85% cases of unilateral dermoid.15 CA 125 can be done in ovarian dermoid cases to rule our malignancy. This tumour marker is generally used in post menopausal women, since malignant ovarian tumours are more common in older women. The most common complication is ovarian torsion (16%) where patient presents with acute abdomen. Other complications include infection (1%), autoimmune haemolytic anaemia (<1%).'0 It can also undergo malignant transformation in 0.1-0.2% of cases.[3] Rupture of cyst is another complication which is rarest complication reported in literature, which usually occurs when the cyst is more than 10 cm, which may lead to shock or haemorrhage with acute chemical peritonitis.

Expectant management can be done n asymptomatic patients with small dermoid cyst with follow up ultrasounds to monitor the growth, appearance and complications of ovarian dermoid cysts as they grow slowly at a rate of 1.8 mm/year.' Mostly cystectomy or oophorectomy is the mode of patient management. Treatment depends on age, fertility, requirement of ovarian reservation, or whether one or both ovaries are involved. Laparotomy is usually performed when the tumour size is more than 10 cm and there is a suspicion of malignancy. Laparoscopy can also be performed when the tumour size is small. Advantages include less chances of infection, less post-operative adhesions, reduced post-operative pain, decreased hospital stay

and improved cosmetic results.? However spillage of contents is more in laparoscopy especially when cyst is more than 8 cm in size. Tumour recurrence may occur after 1-15 years after surgical removal.'8 Therefore, patient needs to be under close surveillance even after surgery.

In our case, the dermoid cyst was spontaneously ruptured which is rarest complication reported in literatures, so intraoperatively extensive adhesions were present which needed meticulous adhesiolysis

and extensive peritoneal lavage to prevent chemical peritonitis and have an uneventful postoperative period.

Conclusion

Ultrasound and MRI is the imaging modality of choice for a dermoid cyst because it is safe, non-invasive, and quick to perform. Leakage or spillage of dermoid cyst contents can cause chemical peritonitis, which is an aseptic inflammatory peritoneal reaction. Once a rupture of an ovarian cystic teratoma is diagnosed, immediate surgical intervention with prompt removal of the spontaneously ruptured ovarian cyst and thorough peritoneal lavage are required.

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JOURNAL SCAN

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Assisted Reproductive Technologies and the Risk of Still Birth in Singleton Pregnancies : a Systematic Review and Meta-Analysis

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Assisted reproductive technologies (ART) consist of techniques such as in vitro fertilization (IVF) and fertilization by IVF and intracytoplasmic sperm injection (IVF-ICSI). The main indication for ART is infertility due to a variety of conditions, for example, female factors (ovulation disorders and tubal factor), male factors (low sperm quality), a combination of these, or idiopathic infertility. Assisted reproductive technologies found to increase the risk of pregnancy complications, including preterm birth and low birth weight, when compared with that of spontaneously/naturally conceived (spontaneous conception) pregnancies. The background for the increased risks of adverse events has been suggested to be attributed to the underlying infertility diagnosis and its etiology and to the treatment procedures, which have been found to increase the risk of maternal preeclampsia and/or hypertension and, subsequently, stillbirth. However, whether ART is also associated with an increased risk of still- birth has been difficult to determine especially due to low event rates and a multitude of possible confounding factors, such as underlying maternal factors associated with the infertility itself, and the high propensity for multiplicity in ART pregnancies. These limitations may be overcome by combining estimates from controlled or adjusted studies in a meta-analysis.

Accordingly, a systematic review and meta-analysis was conducted to investigate whether IVF/IVF-ICSI carries a higher risk of stillbirth compared with natural conception. The analysis was restricted to studies reporting data for singletons to avoid bias from multiplicity and defined stillbirth as intrauterine death from 20 weeks of gestation until birth.

Methods

A protocol for the present review was published on Prospero before the conduction of the review (#216768). The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guide- lines. Two independent authors (K.S., T.E.) reviewed all studies and extracted the data. Study quality was assessed using the Newcastle–Ottawa Scale (NOS) scoring the studies from 0 to 9 points based on the quality of selection, comparability, and outcome. Only studies scoring R7 points and reporting adjusted risks or well-controlled prevalence in case–control groups were included in the meta-analysis

Meta-analysis was performed using Cochrane Review Man- ager 5.4. Study results were compared using ORs. For matched case–control studies, the total number of cases and controls and numbers on stillbirth in the respective groups were used to calculate ORs. For cohort studies adjusting for relevant confounders, the reported adjusted ORs were used. For one study , the ORs stratified by treatment method (frozen IVF or frozen embryo transfer [FET], fresh IVF, and IVF- ICSI) were combined to calculate a common OR. Heterogeneity between studies was assessed using Cochran's Q and I2. An inverse-weighted summary OR was calculated using random-effects meta-analysis. Forest and funnel plots were created to visualize ORs and possible publication bias, respectively.

Results

The systematic literature search yielded 233 studies, of which 19 were included. Four studies did not report an adjusted associa- tion or used matched controls and, thus, did not fulfill the requirements regarding comparability. The combined samples included a total of 1,860,055 births and 6,952 stillbirths. Three out the 10 studies included in the meta-analysis reported numbers on stillbirth where ART was stratified into fresh or frozen cycles. The prevalence rates of still- birth in frozen and fresh cycles in Bay et al. were 0.1% and 0.4%, respectively, compared with 0.1% in the spontaneous conception (SC) group. The prevalence rates in Marino et al. were 0.4% and 1.2%, respectively, compared with 0.5% in the SC group. Lastly, the prevalence rates in Pelkonen et al. were 2.7% and 3.1%, respectively, compared with 0.3% in the SC group. Only Bay et al. calculated separate ORs for frozen and fresh cycle versus SCs (ORs [95% confidence intervals (CIs)], 1.0 [0.2–6.2] and 2.1 [1.2–3.5], respectively).

In the present systematic review and meta-analysis, we found a significantly increased risk of stillbirth in infertile women treated with IVF/IVF-ICSI compared with that in healthy women achieving pregnancy spontaneously (OR [95% CI], 1.82 [1.37–2.42]). The quality of the included studies (NOS) was variable. We found no indications of publication bias. However, given the low incidence of stillbirth, the absolute risk of stillbirth following IVF remains small.

It is unclear whether the increased risk of stillbirth is due to imperfect IVF/IVF-ICSI methods or a consequence of underly- ing maternal/paternal factors causing the infertility (con- founding by indication). This could be investigated by stratification on fresh versus frozen and IVF versus IVF- ICSI as well as evaluating indications for ART.

Conclusion

In conclusion, the risk of stillbirth is significantly increased after conception with IVF/IVF-ICSI compared with that with natural conception. Stillbirth is a rare but serious event, and women/couples receiving treatment for infertility should be informed of the increased risk. For future research, investigating the different subcategories of infertility and their significance could expand our understanding of the stillbirth risk in the infertile/subfertile population. Furthermore, it could hopefully help us when counseling infertile and subfertile women/couples on a more individual level.

Repeat placental growth factor-based testing in women with suspected preterm pre-eclampsia (PARROT-2): a multicentre, parallel-group, superiority, randomised controlled trial

Lancet 2024; 403: 619–31 , doi.org/10.1016/S0140-6736(23)02357-7

Alice Hurrell, Louise Webster, Jenie Sparkes et al

Hypertensive disorders of pregnancy affect 10% of the pregnant population, predominantly comprising chronic hypertension, gestational hypertension, and pre-eclamp- sia. Pre-eclampsia affects 2·8% of women. 25% of pre- eclampsia cases in singleton pregnancies occur before 37 weeks' gestation, and women with preterm pre-eclampsia are more likely to have maternal or perinatal complications. Suspected pre-eclampsia affects approximately 10% of pregnancies, although this is difficult to accurately ascertain. Pregnant women presenting with symptoms and signs of suspected pre-eclampsia account for a substantial proportion of the workload within maternity care. Better methods of early identification and risk stratification are needed to reduce maternal and perinatal morbidity and mortality and to optimise resource allocation.

Abnormally low concentrations of placental growth factor (PlGF) and high concentrations of soluble fms-like tyrosine kinase-1 (sFlt-1) were first identified 25 years ago in a small retrospective case-control study of patients with pre-eclampsia. Subsequently, longitudinal and cross- sectional cohort studies of angiogenic biomarkers showed that PlGF concentrations are significantly lower and sFlt-1 concentrations significantly higher, both in pregnancies with pre-eclampsia and those which later developed pre- eclampsia. Abnormal angiogenic imbalance has been identified up to 10 weeks before the onset of the clinical syndrome of pre-eclampsia. The 2019 PARROT-1 trial investigated PlGF-based testing in 1023 participants in a multicentre stepped-wedge cluster-randomised controlled trial. Findings from the study showed that revealed PlGF- based testing, compared with usual care with concealed PlGF-based testing, reduced time to diagnosis of pre- eclampsia (1·9 days vs 4·1 days, time ratio 0·36 [95% CI 0·15–0·87]) and maternal severe adverse outcomes (4%vs5%;adjusted odds ratio 0·32[95%CI0·11-0·96]).Following this, PlGF-based testing is recommended by the National Institute for Health and Care Excellence (NICE) and the International Society for the Study of Hypertension in Pregnancy on one occasion when preterm pre-eclampsia is first suspected.National guidance in the UK has clearly identified the need to evaluate repeat PlGF-based testing and the impact on maternal and perinatal complications, including stillbirth, neonatal death, neonatal unit admission,

and prematurity. Before repeat PlGF-based testing becomes routine, it needs to be established if it is clinically effective and cost-effective, and what added benefit (or not) repeat PlGF-based testing offers after the initial PlGF-based test. Widespread uncertainty and unwanted variation exists in practice around the purported benefits of repeat PlGF-based testing due to scarce evidence. It was hypothesised that repeat testing would influence surveillance strategies that would impact perinatal outcomes, decreasing neonatal unit admissions (and associated reduced perinatal morbidity and mortality) as well as potentially avoiding unnecessary iatrogenic preterm delivery through appropriate rule-out of pre-eclampsia. Therefore, it was aimed to determine whether revealed repeat PlGF-based testing (with a clinical management algorithm using published NICE guidance with threshold values provided), reduced stillbirth, neonatal death, and neonatal unit admission, or other maternal or perinatal adverse outcomes, in women with suspected preterm pre-eclampsia.

Methods

It was a multicentre, parallel-group, superiority, randomised controlled trial, done in 22 maternity units across England, Scotland, and Wales. Women aged 18 years or older with suspected pre-eclampsia between 22 weeks and 0 days of gestation and 35 weeks and 6 days of gestation were recruited. Women were randomly assigned (1:1) to revealed repeat PlGF-based testing or concealed repeat testing with usual care. The intervention was not masked to women or partners, or clinicians or data collectors, due to the nature of the trial. The trial statistician was masked to intervention allocation. The primary outcome was a perinatal composite of stillbirth, early neonatal death, or neonatal unit admission. The primary analysis was by the intention-to-treat principle, with a per-protocol analysis restricted to women managed according to their allocation group. The trial was prospectively registered with the ISRCTN registry, ISRCTN 85912420.

The PARROT-1 trial demonstrated reduction in maternal adverse outcomes with a single PlGF-based test, and the PARROT-2 trial was therefore planned to examine whether repeat testing might impact perinatal outcomes.

Results

Between Dec 17, 2019, and Sept 30, 2022, 1253 pregnant women were recruited and randomly assigned treatment; one patient was excluded due to randomisation error. 625 women were allocated to revealed repeat PlGF- based testing and 627 women were allocated to usual care with concealed repeat PlGF-based testing (mean age 32·3 [SD 5·7] years; 879 [70%] white). One woman in the concealed repeat PlGF-based testing group was lost to follow-up. There was no significant difference in the primary perinatal composite outcome between the revealed repeat PlGF- based testing group (195 [31·2%]) of 625 women) compared with the concealed repeat PlGF-based testing group (174 [27·8%] of 626 women; relative risk 1·21 [95% CI 0·95–1·33]; p=0·18).

In the revealed repeat PlGF-based testing group, compared with the concealed repeat PlGF-based testing group, there was a significant reduction in the gestational age at delivery (36·7 weeks' gestation vs 37·1 weeks' gestation; mean difference –0·40 weeks [–0·68 to –0·12]; p=0·005) and a significant increase in the number of participants delivering before 34 weeks' gestation (90 [14·4%] of 625 women vs 55 [8·8%] of women; RR 1·63 [95% CI 1·19 to 2·24]; p=0·002. In the revealed repeat PlGF-based testing group compared with the concealed repeat PlGF-based testing group, there was no significant difference in the proportion of women with the severe adverse maternal outcome composite (18 [2·9%[of 625 women in the revealed repeat PlGF-based testing group vs 16 [2·6%] of 626 women in the concealed repeat PlGF-based testing group; adjusted RR 1·13 [95% CI 0·58 to 2·20]; p=0·717; table 4; figure 2). There was an increase in the rate of caesarean birth compared with vaginal birth (427 [68·3%] of 625 women in the revealed repeat PlGF-based testing group vs 59·9% in the concealed repeat PlGF-based testing group; adjusted RR 1·14 [95% CI 1·05 to 1·23]; p=0·002). There was a significant reduction in the time from initial PlGF-based test to diagnosis of pre-eclampsia (19·1 [SD 20·4] days in the revealed repeat PlGF-based testing group vs 22·5 [22·9] days in the concealed repeat PlGF-based testing group; mean difference –3·79 days [95% CI –7·10 to –0·47]; p=0·025). There was also a significant reduction in the time from randomisation to diagnosis of pre-eclampsia (13·6 [SD 19·3] days in the revealed repeat PlGF-based testing group vs 16·7 [20·7] days in the concealed repeat PlGF-based testing group; mean difference –3·37 days [95% CI –6·54 to –0·19; p=0·038];

Conclusion

This study clearly delineates the limited value of repeat PlGF-based testing in women with suspected preterm pre-eclampsia. With an estimated 5% of women globally experiencing preterm pregnancy hypertension, of 140 million births, there is now a clear evidence base for implementation of initial PlGF-based testing, but without the necessity of higher costs associated with repeat PlGF-based testing. These results should therefore lower the barriers to more widespread, equitable adoption of initial PlGF-based testing, improving maternal health outcomes globally.

QUIZ TIME

Sakshi Nayar
Associate Consultant
Centre of IVF and Human Reproduction
Institute of Obstetrics and Gynaecology, Sir Ganga Ram Hospital
New Delhi

1. **Still birth rateofIndia ?**
   a. 10 per 1000 births
   b. 12 per 1000 births
   c. 14 per 1000 births
   d. 16 per 10000 births

2. **According to WHO, still birth rate includes babies dead after:**
   a. 20 weeks
   b. 24 weeks
   c. 28 weeks
   d. 32 weeks

3. **Lateonset FGR is described afterwhat gestational age?**
   a. 28 weeks
   b. 30 weeks
   c. 32 weeks
   d. 34 weeks

4. **Which condition is NOT a cause of still birth ?**
   a. Maternal diabetes
   b. Infections like malaria
   c. Intrahepatic cholestasis of pregnancy
   d. Increased maternal physical activity

5. **ENAP abbreviation full form is :**
   a. Every Newborn Action Plan
   b. Each Newborn Apnea Pattern
   c. Every Newborn Access Plan
   d. Each Newborn Access Path

6. **According to the ARRIVE trial, when should weinduce low risk patients electively ?**
   a. ≥ 38 weeks
   b. ≥ 39 weeks
   c. ≥ 40 weeks
   d. ≥ 41 weeks

7. **What is the globalincidence ofintrapartum still births ?**
   a. 1 million
   b. 2 million
   c. 3 million
   d. 4 million

8. **Which is NOT a part of the medico-legal aspect Still birth handling ?**
   a. Documentation and record keeping
   b. Examination of the still born, placenta and cord
   c. Fetus culture and sensitivity
   d. Registration of still birth

9. **Which country ELITE-39 trial was conducted?**
   a. Spain
   b. United Kingdom
   c. India
   d. United Statesof America

10. **WHO classification system ofstill birth ?**
    a. ICD-PM
    b. ILD-NM
    c. ICD-NM
    d. ILD-NM

Ans.1 (b), Ans.2 (c), Ans.3 (c), Ans.4 (d), Ans.5 (c), Ans.6 (b), Ans.7 (a), Ans.8 (c), Ans.9 (c), Ans. 10 (a).

ACTIVITIES HELD UNDER NARCHI IN NOVERMBER 2024

PUBLIC AWARENESS LECTURES ON RESPECTFUL MATERNITY CARE HELD ON 14TH Nov, 2024

NARCHI DELHI CHAPTER - Together with Institute of Obstetrics & Gynaecology and Institute of Anaesthesiology, Pain & Perioperative Medicine, Sir Ganga Ram Hospital, New Delhi organized Public Awareness Lectures on Respectful Maternity Care at **Sir Ganga Ram Hospital, New Delhi** on 14th November 2024.

It was attended by 8 antenatal patients along with their husbands, an interactive session was held where basics of "Pregnancy of Labour" was taken by Dr. Sharmistha Garg, " Labour pain is the most painful experience in a woman's life" was taken by Prof. (Dr.) Anjeleena Kumar Gupta, "Dietary Management" was taken by Dr. Vandana, "Role of Physiotherapy" was taken by Dr. Deepti Pandey (PT), "Breast Feeding" was taken by Mrs. Priya Gandhi & "The Maternity Bag" was taken by S/N Sarita Samul. The topics were discussed in detail and all the related queries were answered. This sessions of Public Awareness Lectures was highly appreciated.




CME ON "TOWARDS LGBTQIA + INCLUSIVE HEALTHCARE" A CME session with Healthcare providers at Sir Ganga Ram Hospital by Nazariya Foundation & SAATHII under the aegis of Institute of Obstetrics & Gynaecology, DGF Central & NARCHI DELHI CHAPTER on 25th November 2024 at Auditorium, Sir Ganga Ram Hospital.

We had inputs from experienced chairpersons like – Dr. Mala Srivastava, Dr. Malvika Sabharwal, Dr. Kanika Jain, Dr. Ajay Agarwal, Dr. Roma Kumar, Dr. Bheem S. Nanda, Dr. Jyoti Bali, Dr. Setu Gupta, Dr. Shweta Mittal, Dr. Preteender Bedi, Dr. Rajeev Mehta, Dr. Chandra Mansukhani, Dr. Shivani V. Sabharwal, Dr. Anubhav Gupta, Dr. Ruma Satwik, Dr. Ramnik Sabharwal, Dr. Punita Bhardwaj. We were lucky to have star

speakers who enlightened us on topics of " Introduction to SOGIESC concepts by Dr. L. Ramakrishnan", "Challenges Faced by LGBTQIA + community – Perspective from lived experiences & case studies by Debansh, Nick & Kushi Pahuja", "Way Forward opportunities for engagement with LGBTQIA+ issues in Medical education & practice (interactive session) by Anushruti Shukla. The CME was attended by approximately 60 delegates.

It was an interactive session with lots of take home messages.




ACTIVITIES HELD UNDER NARCHI IN DECEMBER 2024

VIRTUAL JOURNAL CLUB organized by the Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital under aegis of NARCHI Delhi Chapter and Clinical Research Committee of FOGSI on 13th December, 2024 between 06:30-08:00 pm. Dr. Surekha Tayade was Chief Guest and Dr. Kalpana Kumar was Guest of Honor. We were blessed with the presence of Dr. Sharda Jain & Dr. Chandra Mansukhani. The experts were Dr. Ruma Satwik, Dr. Sonal Bathla and Dr. Savita Tyagi, Moderators were Dr. Meenakshi Rohilla and Dr. Plaksha Goel who presented **"Mid – Trimester uterine artery Doppler for aspirin discontinuation in pregnancies at high risk for preterm pre-eclampsia : post HOC analysis of stop PRE trial"**. It was very interesting and interactive session. The webinar was attended by 45 delegates and they all appreciated the efforts and endeavor of NARCHI Delhi team.

PUBLIC AWARENESS LECTURES ON RESPECTFUL MATERNITY CARE HELD ON 14th Dec, 2024

NARCHI DELHI CHAPTER - Together with Institute of Obstetrics & Gynaecology and Institute of Anaesthesiology, Pain & Perioperative Medicine, Sir Ganga Ram Hospital, New Delhi organized Public Awareness Lectures on Respectful Maternity Care at **Sir Ganga Ram Hospital, New Delhi on 14th December 2024.**

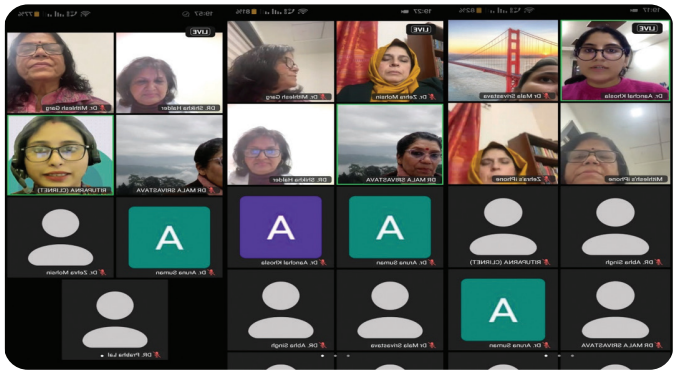
It was attended by 5 antenatal patients along with their husbands, an interactive session was held where basics of "Pregnancy of Labour" was taken by Dr. Sharmistha Garg, "Labour pain is the most painful experience in a woman's life" was taken by Dr. Mahima, "Dietary Management" was taken by Dr. Shipra, "Role of Physiotherapy" was taken by Dr. Jyotsna, "Breast Feeding" was taken by S/N Sushmita & "The Maternity Bag" was taken by S/N Sarita Samul. The topics were discussed in detail and all the related queries were answered. These sessions of Public Awareness Lectures were highly appreciated.

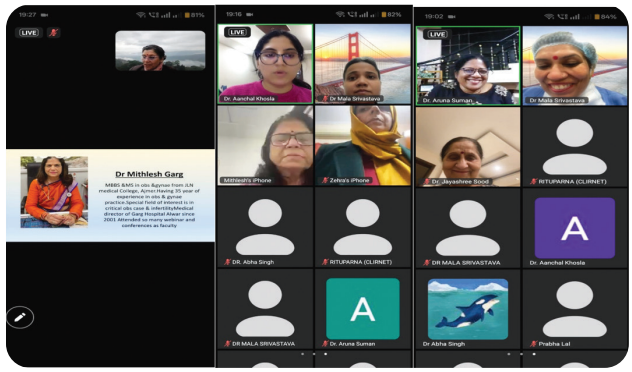
It was an interactive session and all the patients and their partners really appreciated the event.

WEBINAR ON ONCOLOGY was held on 26th December 2024 by the Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital under aegis of NARCHI Delhi Chapter and Clinical Research Committee of FOGSI.

We were blessed by our chief guests Dr. Jayashree Sood. We were happy to have Senior and experienced Guest of honors Dr. Abha Singh, who enriched our learning with her inputs and experience. The convener was Dr. Mala Srivastava, President of NARCHI Delhi Chapter. Dr. Anchal Khosla gave a wonderful lecture on "Immunohistochemistry in Gynae – Cancer" under the superb guidance of Chairpersons – Dr. Aruna

B., Dr. Rashmi Kahar & Dr. Uma Jaiswal. Following this was a very interesting lecture by Dr. Shikha Haldar on "Radiotherapy in Gynae Cancer" under the experienced chairpersons – Dr. Zehra Mohsin & Dr. Mithlesh Garg. The webinar was attended by 30 delegates and they all appreciated the efforts and endeavor of NARCHI Delhi team.

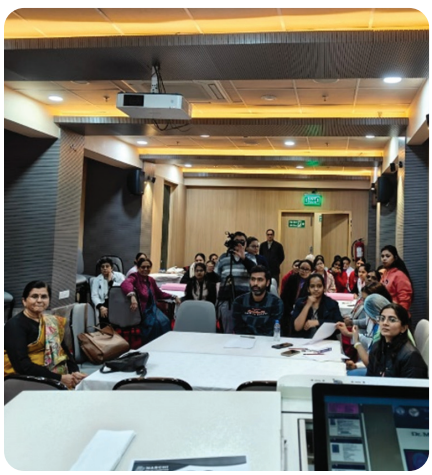


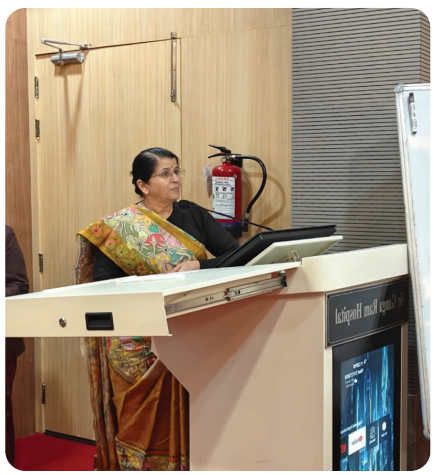


CME ON "RESPECTFUL MATERNITY CARE" HELD ON 28th DECEMBER, 2024

NARCHI Delhi chapter organized CME on Respectful Maternity Care on 28th December 2024 at Sir Ganga Ram Hospital, New Delhi.

We were blessed by our Chief Guest – Dr. Jayashree Sood & Guest of Honor - Dr. Achla Batra. We had inputs from experienced chairpersons like - Dr. Kanwal Gujral & Dr. Geeta Mediratta. We were lucky to have star speakers who enlightened us on topics of "Respectful Maternity Care" by Dr. Manju Puri & Dr. K. Aparna. The CME was attended by approximately 65 delegates. It was an interactive session with lots of take home messages.





Pre Conference Workshops - 3rd and 4th October 2024

NARCHI DELHI 2024

30th Annual Conference of National Association for Reproductive & Child Health of India
Theme: "Be Aware-Adopt-adhere to the protocols"

MASTERING MYOMECTOMY VIDEO WORKSHOP

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 3rd October 2024
Time: 09:00 - 05:00 pm

Venue: Hall 'A' Auditorium, Sir Ganga Ram Hospital

Convener
Dr. Punita Bhardwaj

Chief Guest
Dr. Jaya Shree Sood

Guest of Honour
Dr. A.K. Bhalla

Co-Convener
Dr. Renuka Brijwal,

Co-Convener
Dr. Jhanvi

09:00-09:15 AM	REGISTRATION		
—	WELCOME ADDRESS AND INAUGURATION		
Time	Topic	Speaker	Chairperson
9:30 – 10:00 am	Port Placements in Laparoscopic Myomectomy	Dr. Shivani Sabharwal	Dr. K. Gujral Dr. Sanjivni Khanna Dr. Geeta Mediratta
10:00 - 10:30 am	Incision and Enucleation in Laparoscopic Myomectomy	Dr. Debasis Dutta	
10:30 - 11:00 am	Tissue retrieval & Laparoscopic Myomectomy	Dr. Alka Sinha	
11:00 – 11:30 am	Hemostasis in Endoscopic Myomectomy	Dr. Dinesh Kansal	Dr. Harsha Khullar Dr. Sandeep Talwar Dr. Tripti Sharan
11:30 - 12:00 noon	Uterine Reconstruction and Laparoscopic Myomectomy	Dr. Punita Bhardwaj	
12:00 -12:30 pm	TEA BREAK		
12:30 – 01:30 pm	Complications & Pit falls in Laparoscopic Myomectomy **Moderator:** Dr. Punita Bhardwaj **Discussants:** Dr. Alka Sinha, Dr. Anupama Sethi, Dr. Dinesh Kansal , Dr. Jyoti Mishra, Dr. Meenakshi Goyal, Dr. Neema Sharma, Dr. Sanjeevni Khanna, Dr. Shivani Sabharwal, Dr. Usha Kumar		Dr. Renu Mishra Dr. Pikee Saxena Dr. Renu Tanwar
01:30 - 02:00 pm	LUNCH		
02:00 – 02:30 pm	Hysteroscopic Morcellation	Dr. Anupama Sethi	Dr. K. K. Roy Dr. Indu Chawla Dr. Anjila Aneja
02:30 – 03:00 pm	Hysteroscopic Myomectomy	Dr. Neema Sharma	
03:00 – 03:30 pm	Complications in Operative Hysteroscopy	Dr. Meenakshi Goyal	
03:30 – 04:00 pm	Laparoscopy v/s Robotic myomectomy	Dr. Jyoti Mishra	Dr. Neena Singh Dr. Mala Shrivastava Dr. Chandra Mansukhani
04:00 – 04:30 pm	Robotic and Multiple myomectomy	Dr. Usha Kumar	
	Vote of Thanks		

Hands on Endotrainer for all registered delegates 9:00 to 6:00 pm

CONTACT US:
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NARCHI DELHI 2024

30th Annual Conference of National Association for Reproductive & Child Health of India
Theme: "Be Aware-Adopt-adhere to the protocols"

OBSTETRICS SKILL WORKSHOP

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 3rd October 2024
Time: 08:00 - 04:00 PM

Venue: Hamdard Institute of Medical Sciences and Research, Jamia Hamdard, New Delhi

08:30 - 09:00 AM	REGISTRATION	
—	WELCOME ADDRESS AND INTRODUCTION	
Time	TOPIC	Speaker
Session 1 - Chairpersons: Dr. Vinita Sarabhai, Dr. Ritu Sharma		
9:05 - 9:15 AM	Breech vaginal delivery	Dr. Dina Aisha Khan
9:15 - 9:25 AM	Shoulder Dystocia	Dr. Supriya Chaubey
9:25 - 9:35 AM	Instrumental vaginal delivery	Dr. Shilpi Nain
9:35 - 9:45 AM	Balloon Tamponade	Dr. Nidhi Gupta
9:45 - 10:00 AM	TEA	
Time	TOPIC	Speaker
Session 2 - Chairpersons: Dr. Bindu Yadav, Dr. Reva Tripathi		
10:00 - 10:10 AM	Approach in case of adhesions	Dr. Neha Varun
10:10 - 10:20 AM	Second stage Cesarean section	Dr. Sumedha Sharma
10:20 - 10:30 AM	Delivering baby in malpresentations and use of forceps and vacuum in cesarean	Dr. Arpita De
10:30 - 10:40 AM	Hemostatic sutures	Dr. Arifa Anwar
10:40 - 10:50 AM	Stepwise devascularization & Int iliac Ligation	Dr. Aruna Nigam
10:50 - 1:00 PM	**HANDS ON SESSION:** 2nd stage (Patwardhan), Shoulder dystocia, Instrumental vag deliy, Baby delivery with Malpresentations in CS & instruments in CS, Hemostatic sutures, SWD & int iliac artery ligation, Balloon Tamponade.	
1:00 - 1:45 PM	LUNCH	
Time	TOPIC	Speaker
Session 3 - Chairpersons : Dr. Sunita Malik, Dr. Raka Guleria		
1:45 -2:00 PM	LSCS- Normal Technique	Dr. Jayshree Sunder
2:00 - 2:15 PM	Bladder Repair	Dr. Yasir
2:15 - 2:30 PM	Peripartum Hysterectomy	Dr. Aruna Nigam
2:30 - 2:45 PM	Complete Perineal Tear Repair	Dr. Mohini Agarwal
2:45 - 4:15 PM	**HANDS ON SESSION :** Cesarean suturing, Bladder suturing, Complete perineal repair (on Tissues)	
4:15 - 4:45 PM	VOTE OF THANKS AND TEA	

Organizing Chairperson
Prof Aruna Nigam

Organizing Secretary
Dr. Nidhi Gupta

Treasurer
Dr. Aama Khanday

Organizing Committee

Dr. Arifa Anwar Elahi
Dr. Pratibha Roy
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NARCHI DELHI 2024

30th Annual Conference of National Association for Reproductive & Child Health of India
Theme: "Be Aware-Adopt-adhere to the protocols"

VIDEO WORKSHOP ON UROGYNAECOLOGY

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 3rd October 2024
Time: 08:00 - 04:00 PM

Venue: Auditorium, Sant Parmanand Hospital, Civil Lines, Delhi

Convener : Dr. Sonal Bathla
Co-Convener : Dr. Uma Rani Swain

Chief Guest : Dr. Sharda Jain
Guest of Honour: Dr. Ashok Kumar, Dr. Nirmala Agarwal

	REGISTRATION	
	WELCOME ADDRESS AND INTRODUCTION	MOC: Dr. Anju Bala

Time	TOPIC	Speaker	Chairpersons
	Session 1- Ascending Beyond : The Art & Science of Non Descent Vaginal Hysterectomy		
9:00 - 9:20 am	The Art of Vaginal Surgery: An Anatomical Approach	Dr. Monika Gupta	Dr. Sharda Jain, Dr. N B Vaid, Dr. Indu Chawla, Dr. Neha Mishra, Dr. Shalu Jain, Dr. Mohini Agarwal
9:20 - 9:40 am	Non Descent Vaginal Hysterectomy: Surgical Dilemmas	Dr. Sonal Bathla	
9:40 - 10:30 am	Panel: NDVH unveiled: Expert Perspectives & Practices	Dr. Sweta Balani Dr. Priti Arora Dhamija	Dr. Rajeshree Jain, Dr. A.G Radhika, Dr. Reena Yadav, Dr. Rashmi Malik, Dr. Rinku Sen Gupta, Dr. Anshuja Singla
10:30 - 11:00 am	**INAUGURATION AND TEA BREAK**		
	Session II- A Comprehensive Session : Understanding the Management of Utero-Vaginal Prolapse		
11:00 - 11:20am	Tissue Triumph: Advocating Prolapse Treatment through Native tissue Repair	Dr. Uma Rani Swain	Dr. Manju Khemani, Dr. Shakuntala Kumar, Dr. Jayshree Sunder, Dr. Arbinder Dang, Dr. Vandana Agrawal, Dr. Payal Agarwal
11:20 - 11:40am	Reinforcing the Vault: Insights into Sacrospinous Colpopexy	Dr. R. K Purohit	
11:40 - 12:00noon	Advanced Techniques in High Uterosacral Suspension for better Surgical Outcome & Patient Care	Dr. Hara Prasad Pattanaik	
12:00 - 12:50pm	Panel Discussion : Evidence Based Management of Prolapse of Different Compartments of Vagina	Dr. Sandhya Jain Dr. Swati Agrawal	Dr. Ranjana Sharma, Dr. Manju Puri, Dr. Achla Batra, Dr. Pawan Bhasin, Dr. Poonam Sachdeva.
1:00 - 2:00 pm	**Lunch**		
	Session III-Confidence Regained:Conquering Bladder Incontinence withModern Solutions		
2:00 - 2:20 pm	Applied Anatomy for SUI & Role of Autologous Sling	Dr. Karishma Thariani	Dr Chitra Setya, Dr Jyoti Chugh, Dr Abha Sharma, Dr Uma Vadynathan, Dr Sonia Madaan Dr Anju Bala
2:20 - 2:40 pm	Burch Colposuspension	Dr. Alka Sinha	
2:40 - 3:00 pm	Physiology & Medical Management of Urge Urinary Incontinence	Dr. Nikhil Khattar	
3:00 - 3:50 pm	Panel : Transforming Lives with Innovative Incontinence Solutions	Dr. Amita Jain Dr. Manasi Deoghare	Dr. J B Sharma, Dr. Geeta Mediratta, Dr. Shrihari Anikhindi Dr. Rajesh Kumari, Dr. Jaya Chawla
3:50 - 4:00 pm	**Vote of Thanks**		

CONTACT US:
Institute of Obstetrics & Gynaecology
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NARCHI DELHI 2024 www.narchidelhi2024.com

NARCHI DELHI 2024

30th Annual Conference of National Association for Reproductive & Child Health of India
Theme: "Be Aware-Adopt-adhere to the protocols"

TRANSFORMING HEALTHCARE THROUGH PASSION AND INNOVATION

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 08:00 - 11:00 AM

Venue: Hotel The Lalit, Connaught Place, New Delhi

Chief Guest : Dr. Manoj Gupta

Convener : Dr. Sushma Sinha **Co-Convener : Dr. Divya Chauhan**

07:45 AM	REGISTRATION	
Time	**TOPIC**	**Speaker**
	Stations	
8:00 am – 9:00 am	MCP card orientation	Dr. Divya Chauhan
	Hand Hygiene	Neelam Chauhan
	tools to identify high risk women	Seema Prakash
	Breastfeeding -each one teach one	Komal Chauhan
Time	**TOPIC**	**Speaker**
	Lectures	
9:00 am – 9:15 am	WELCOME ADDRESS AND INTRODUCTION BREAKFAST	
9:15 am – 9:30 am	LAMP LIGHTNING	
9:30 am – 9:45 am	Comprehensive Antenatal and Postnatal care	Dr Anjali Dosajh
9:45 am – 10:00am	Identify High Risk pregnancy	Dr Seema Prakash
10:00 am - 10:15am	Anaemia in Pregnancy and recommended diet for pregnant and lactating women	Dr Sushma Sinha
10:15 am to 10.45am	Role of Asha and ANM for Safe delivery	Dr Divya Chauhan
10:45 am - 11:00 am	Kilkari	Purna Chakroborty

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Royal College of Obstetricians & Gynaecologists

30th Annual Conference of National Association for Reproductive & Child Health of India

Theme: "Be Aware-Adopt-adhere to the protocols"

PRE CONFERENCE WORKSHOP

CTG:INTRAPARTUM FETAL MONITORING

Organized by:
Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi
&
"IRC RCOG India North"

Date: 4th October 2024
Time: 9:00am-1:00pm
Venue: Hotel The Lalit, Connaught Place, New Delhi

Convener : Dr. Mamta Dagar
Co-Convener : Dr. Purvi Khandelwal

MOC : Dr. Purvi Khandelwal & Dr. Huma Ali

08:30-09:00 AM	REGISTRATION
09:00-09:15 AM	WELCOME ADDRESS AND INTRODUCTION (Dr. Mamta Dagar)
	Chairpersons : Dr. Kanwal Gujral, Dr. Geeta Mediratta, Dr. Mamta Dagar, Dr. Neeti Tiwari

Time	Session 01	Speaker
09:15-09:30 AM	• Pathophysiology Behind CTG (5 min Q/ A & Discussion)	Dr. Jharna Behura
09:30-09:50 AM	• CTG Interpretation (5 min Q/ A & Discussion)	Dr. Poonam Tara
09:55-10:10 AM	• Pathological CTG - when to Intervene (5 minutes Q/A & Discussion)	Dr. Jayasree Sundar
10:15-10:30 AM	• Optimal Fetal Surveillance in Labour (5 min Q/ A & Discussion with)	Dr. Mamta Mishra
10:45-01:00 PM	**Breakout session-CTGs with 5 case scenarios ,15 min each session :** Dr. Jayasree Sundar, Dr. Jharna Behura, Dr. Poonam Tara, Dr. Shelly Arora, Dr. Mamta Mishra, Dr. Muntaha Khan, Dr. Huma Ali, Dr. Purvi Khandelwal, Dr. Puja Jain	

FACULTIES

Dr. Kanwal Gujral
Dr. Neeti Tiwari
Dr. Jayasree Sundar
Dr. Jharna Behura
Dr. Geeta Mediratta
Dr. Huma Ali
Dr. Poonam Tara
Dr. Shelly Arora
Dr. Mamta Dagar
Dr. Purvi Khandelwal
Dr. Mamta Mishra
Dr. Muntaha Khan
Dr. Puja Jain

SUMMARY

This workshop is designed for professionals involved in intrapartum care. It provides a comprehensive overview of CTG interpretation and management strategies to improve fetal outcomes during labor. The combination of lectures and breakout sessions ensures practical, hands-on experience with real case scenarios.

WHY YOU MUST ATTEND

- Understanding the pathophysiology of fetal hypoxia and its manifestation on CTG
- Correct Interpretation of CTG
- Interpret CTG abnormalities that might suggest hypoxia
- Improve your decision making in Intrapartum management & avoid Intrapartum hypoxia

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Theme: "Be Aware-Adopt-adhere to the protocols"

FP SERVICES: EXPANDING SERVICES, ENSURING RIGHTS

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 02:00 - 05:00 pm

Venue: Hotel The Lalit, Connaught Place, New Delhi

Convener
Dr. Sumita Mehta

Co-Convener
Dr. Anshul Rohtagi

02:00 - 02:15 pm	REGISTRATION WELCOME ADDRESS		
Time	**Topic**	**Speaker**	**Chairperson**
	SESSION - 1		
02:15 - 02:30 pm	MTP Act- Connecting the Dots	Dr. Amita Agarwal	Dr. Nalini Bala Pandey Dr. Richa Sharma Dr. CD Jassal Dr. Poonam Sachdeva
02:30 - 2:45 pm	Second Trimester Abortion- Protocols and Techniques	Dr. Anshul Rohtagi	
	SESSION - 2		
2:45 - 3:00 pm	Postabortion Contraception : Challenges & Stitching the Gap	Dr. Rashmi Gera	Dr. Harsha Khullar Dr. Suman Lata Mendiratta Dr. Rachna Sharma Dr. Arifa Anwar
3:00 - 3:15 pm	Breaking Barriers-Immediate Postpartum LARC	Dr. Kanika Chopra	
	SESSION - 3		
3:15 - 3:30 pm	Manual Vacuum Aspiration : Regaining Confidence	Dr. Sumita Mehta	Dr. Ashok Kumar Dr. Sudha Gupta Dr. Anita Rajorhia
3:30 - 3:45 pm	Subdermal Implant: New Kid on the Block	Dr. Anshuja Singla	
	SESSION - 4		
3:45 - 4:15 pm	Role Play- Contraception Conundrum	**Experts :** Dr. Renu Manchanda Dr. Jyoti Sachdeva Dr. Vinita Gupta Dr. Neeta Sagar	
4:15 - 5:00 pm	**"Hands-on Workshop" on MVA and subdermal Implants**	**Trainers :** Dr. Shailja R Sinha Dr. Sumita Mehta Dr. Anshuja Singla Dr. Neha Varun	

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30th Annual Conference of National Association for Reproductive & Child Health of India
(NARCHI)-Delhi Branch and (IFS) Indian Fertility Society
Theme: "Be Aware-Adopt-adhere to the protocols"

FINE-TUNING OVARIAN STIMULATION FOR PRACTISING GYNECOLOGISTS

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 09:00 - 01:00 PM
Venue: Hotel The Lalit, Connaught Place, New Delhi

Convener : Dr.Shweta Mittal Gupta
Co-Convener : Dr.Neeti Tiwari
Coordinator: Dr.Sakshi Nayar

08:45 AM	REGISTRATION	
9:00am – 9:05am	Welcome address by convener	
9:05 am - 9:10 am	Address by chief guests	
Time	**TOPIC**	**Speaker**
Session 1 - Chairpersons: Dr. Sharmistha Garg, Dr. Tejashri Shrotri, Dr. Shikha Gurnani		
9:10 am - 9:30 am	Revisiting Oral ovulogens	Dr. Ruma Satwik
9:30 am - 9:50 am	How to use gonadotropins safely for ovarian stimulation in IUI?	Dr.Surveen Ghumman
9:50 am -10:10 am	When and how to trigger?	Dr Puneet Rana Arora
Time	**TOPIC**	**Speaker**
Session 2 - Dr. Sheetal Sachdeva, Dr. Shivani Sabharwal, Dr. Ankita Sethi		
10:10am - 10:30am	How do I improve my Success rate in IUI ?	Dr.Abha Majumdar
10:30am - 10:45am	How to set up level 1 ART clinic?	Dr.Rashmi Sharma
10:45am -11:00am	Antioxidants in infertility (sponsored by Celagenics)	Dr. Sakshi Nayar
11.00am -11.15 am	**Tea Break**	
Time	**Session 3 - Panel Discussion**	
11.15 am – 12.15 pm	Moderator: Endocrinopathies affecting Ovarian stimulation: Practical approach	
	Moderators: Dr.Shweta Mittal Gupta, Dr.Neeti Tiwari	
	Panelists : Dr. Pikee Saxena, Dr. Setu Gupta (Endocrinologist), Dr. Jyoti Bali, Dr. Sunita Arora, Dr. Renu Tanwar, Dr. Nisha Bhatnagar , Dr. Bhawani Shekhar, Dr. Manisha Navani	
Time	**Session 4**	
12:15 PM – 1:00 PM	**Reverse panel :** Difficult situations in ovarian stimulation	
12:15- 12:25	Case 1: Stagnant follicle with clomiphene citrate Presenter : Dr. Renu Singh ; Experts: Dr. Shalini Chawla Khanna, Dr. Parul Garg	
12:25-12:35	Case 2: Multiple follicles with thin ET with letrozole stimulation Presenter : Dr. Snigdha ; Experts : Dr. Aanchal Agarwal , Dr. Ankita Sethi	
12:35- 12:45	Case 3: Unilateral small endometrioma with infertility Presenter: Dr. Tanu Sharma ; Experts: Dr. Tejashri Shrotri, Dr. Keya Kalra	
12:45 - 12:55	Case 4: Mild Male factor infertility Presenter : Dr. Nisha Yadav; Experts : Dr. Sweta Gupta, Dr. Shikha Jain	
1:00 pm	**Lunch**	

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Theme: "Be Aware-Adopt-adhere to the protocols"

GENETICS

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 02:00 - 05:00 PM
Venue: Hotel The Lalit, Connaught Place, New Delhi

Convener : Dr. Veronica Arora

------	REGISTRATION		
01:00 PM	WELCOME ADDRESS AND INTRODUCTION		Dr. Veronica Arora
(10min)	**Pre workshop questionnaire**		
Time	**TOPIC**	**Speaker**	**Chairpersons**
2:15 - 2:35	Meaning Aneuploidy screening - The Markers and their	Dr. Seema Thakur	Dr. Sangeeta Gupta Dr. Ramnik Sabharwal Dr. Vidhi Hathi
2:35 - 3:00	Chromosomal microarray demystified. Indications and Interpretation	Dr. Sunita Bijarnia	Dr. Leena Sridhar Dr. Alok Varshney Dr. Anubhuti Rana
3:00 - 3:20	Exome Elaborated- Indications and Interpretation	Dr. Ratna Puri	Dr. Vandana Chadha Dr. Neerja Gupta
3:20 - 3:45	Genetic tests for specific indications Miscellaneous prenatal genetic testing	Dr. Madhulika Kabra	Dr. Vatsala Dadwal Dr. Dipika Deka
3:45 - 4:05	**Hands-on Training**		
3:40 - 4:00	**Discussion**		
Time	**Topic**	**Group 1**	**Group 2**
	Case based hands on training for ordering and interpretation of tests	Dr Sangeeta Khatter Dr Sameer Bhatia	Dr. Swasti Pal Dr. Mayank Nilay
10 min	**Post Workshop Questionnare**		

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"COMPREHENSIVE OBSTETRIC SKILLS" NURSES MODULE

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 08:00 - 11:00 am

Venue: Hotel The Lalit, Connaught Place, New Delhi

Convener : Dr. Seema Prakash
Special Guest : Dr. Mala Shrivastava, Mrs. Upasana Arora
Guest of Honour : Dr. Ashwani Dalmia, Dr. Archana Verma, Dr. Tarini Taneja, Dr. Kanika Gupta
Special Invitee : Dr. (Col) Pranjali Dhume, Dr. Pratiksha Gupta, Mrs Shalini Mittal
Co-Convenor : Dr. Srishti Prakash, Dr. Neha Varun
Chief Coordinators : Dr. Anita Rajorhia, Dr. Bhanupriya
MOC : Dr. Bhanupriya, Dr. Rashmi Shreya

Time	TOPIC	Speaker	Chairperson's/ Panelists/ Experts
7:30 - 8:00 am	Registration		
8:00 - 8:15 am	Welcome Address and Introduction	Dr. Seema Prakash	Dr. Neha Varun Dr. Srishti Prakash
8:15 - 9:15 am	Skits : 5 min/skits 15 min discussion Topics : 1. Obstetric hemorrhage emergency management 2. Lactation counselling in women 3. Breaking Bad News 4. Patient Identification 5. Respectful Maternity Care	Moderators: Dr. Neha Varun Dr. Srishti Prakash Dr. Smiti Jain Dr. Haritha Mannem Ms. Anjali Sharma Ms. Josephine Ms. Manita Ms. Promila	Judges: Dr. Kanika Gupta Dr. (Col) Pranjali Dhume Dr. Tarini Taneja Dr. Sunita Arora Dr. Shivani Gaur Dr. Pratiksha Gupta Dr. Shama Batra Dr. Vandana Gupta
9:15 - 9:30 am	Slogan	Moderators: Dr. Neha Pruthi Dr. Tanvi Ms. Promila Ms. Seema Mittal	Judges Dr. Sujata Agarwal Dr. Rashi Agrawal Dr. Mamta Tyagi Dr. Ritu Arya Dr. Manpreet Saini
9:30 - 9:45 am	Posters 1	Moderators: Dr. Chandana Shekhar Dr. Aditi Ghai Ms. Neelima	Judges: Dr. Vandana Gupta Dr. Vineeta Gupta Dr. Vibha Bansal
	Posters 2	Moderators: Dr. Shuchita Sharma Dr. Supriya Chaubey Ms. Seema Mittal	Judges: Dr. Haritha Mannem Dr. Deepa Gupta Ms. Shalini Mittal Dr. Neelam Gupta
9:45 - 10:00 am	INAUGURATION & LAMP LIGHTING		
	Panel discussion	Moderators:	Judges:
10:00-10:15 am	1. Antenatal Care	Dr. Neha Pruthi Dr. Vineeta Gupta Dr. Neha Varun	Dr. Pratiksha Gupta Dr. Rashi Agrawal Dr. Mamta Tyagi Ms. Urvashi Chaglani
10:15-10.30 am	2. Postnatal Care & Contraception	Dr. Aditi Ghai Dr. Manpreet Saini Dr. Bhanupriya	Dr. Kanika Gupta Dr. Tarini Taneja Dr. Sunita Arora Dr. Shuchita Sharma Ms. Latha
10.30-10.45 am	3. Emergency Obstetrics	Dr. Rashmi Shriya Dr. Aastha Srivastav Dr Srishti Prakash	Dr. Sushma Sinha Dr. Anita Rajorhia Dr. Ritu Arya Ms. Josephine
10:45-11:00 am	Valedictory function/Vote of thanks		

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STILL BIRTHS: DECODING THE ENIGMA

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 02:00 - 05:00 pm

Venue: Hotel The Lalit, Connaught Place, New Delhi


Convener
Dr. Nidhi Khera


Co-Convener
Dr. Kumar Ankur


Co - Convener
Dr. Chanchal

02:00 - 02:05 pm	REGISTRATION WELCOME ADDRESS

Time	Topic	Speaker
PREVENTIVE OF STILL BIRTH		
	Chairpersons : Dr. Kanwal Gujral, Dr. A.G. Radhika, Dr. Vatsla Dadhwal, Dr. Alok Bhandari	
02:05 - 02:20 pm	Is Stillbirth preventable ?	Dr. Tamkeen Khan
02:25 - 02:40 pm	Intrapartum Prevention of Stillbirth	Dr. Rinku Sen Gupta
02:45 - 03:00 pm	Role of Neonatologist in preventing Stillbirth	Dr. Avneet Kaur
THE UNTHINKABLE HAS HAPPENED .... what next?		
	Chairpersons : Dr. Asmita Rathore, Dr. Dipika Deka, Dr. Preety Aggarwal, Dr. Shilpa Ghosh	
03:05 - 03:25 pm	Evaluation of Stillbirth Fetus & Placenta	Dr. Ratna Puri
03:30 - 04:30 pm	Panel Discussion : Case Scenarios : What went wrong ? Moderators : Dr. Chanchal, Dr. Nidhi Khera Experts : Dr. Reva Tripathi, Dr. Dipika Deka Panelists :- Dr. Jayasree Sundar, Dr. Poonam Tara, Dr. Manisha, Dr. Nandita Dimri, Dr. Seema Thakur, Dr. Kumar Ankur	
	Chairpersons : Dr. Tamkeen Khan, Dr. Kiran Arora, Dr. Krishna Aggarwal, Dr. Richa Aggarwal	
04:30 - 05:00 pm	Role Play - Breaking News of Still birth	Dr. Kamna Datta & Team
	Vote of Thanks	

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CRITICAL CARE IN OBSTETRICS

"Organized by Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital, New Delhi"

Date: 4th October 2024
Time: 08:30 - 04:30 PM

Venue: Old LT opp OPD Building , VMMC and Safdarjung Hospital, New Delhi

MOC: Dr. Himal and Dr. Sakshi

CONVENER : DR. JYOTSNA SURI
CO-CONVENER : DR. REKHA BHARTI

08:30 - 09:00 AM	REGISTRATION AND PRELIMINARY QUIZ		
09:00 - 09:05 AM	WELCOME ADDRESS AND INTRODUCTION		DR. BINDU BAJAJ
Time	**TOPIC**	**Speaker**	**Chairpersons**
09:05 - 10:00 AM	**Session 1- Cross Talk : Evaluation of Critically Ill Pregnant Women**		
09:05 - 09:30 AM	Why critically ill pregnant women are a challenge?	Dr. Sheeba Marwah, Dr. Binita Jaiswal	Dr. Anjali Dabral, Dr. Bindu Bajaj, Dr. Usha Rani, Dr. Sunita Yadav
09:30 - 9:55 AM	Early warning scores Why & When?	Dr. Ratna Biswas, Dr. Anjila Aneja	
09:55 - 10:00 AM	Audience Interaction		
10:00 - 11:00 AM	**Session II- Point of Care Tests in Critically Ill Pregnant Women**		
10:00 - 10:25 AM	RUSH Protocol	Dr. Nalini Bala Pandey	Dr. Achla Batra
10:25 - 10:50 AM	ABG	Dr. Jyotsna Suri	Dr. Mala Srivastava
10:50 - 11:00 AM	Audience Interaction		Dr. Jyoti Sachdeva Dr. Upma Saxena
11:00 - 11:30 AM	**INAUGURATION**		
11:30 - 11:50 AM	**Tea Break**		
11:50 - 12:50 AM	**Session III- Panel Discussion**	**Moderators: Dr. Rekha Bharti, Dr. Zeba Khanam**	**Expert: Dr. Jyotsna Suri**
	Eclampsia with HELLP, PE & AKI,	Dr. Sumitra Bachani, Dr. Meenakshi, Dr. Rajesh Kumar, Dr. Rajesh Kumari (SJH)	
	AFE, Maternal Collapse with DIC	Dr. Taru Gupta, Dr. Prasoon Gupta, Dr. Leena N Sreedhar	
12:50 - 01:30 AM	**Session IV- Sepsis in Obstetrics**		
12:50 - 01:05 PM	SSC bundle approach	Dr. Niharika Dhiman	Dr. Sudha Salhan
01:05 - 01:20 PM	Antibiotics in Sepsis	Dr. Rekha Bharti	Dr Anita Kumar, Dr. Reeta
01:20 - 01:30 PM	Audience Interaction		Dr. Kavita Agarwal
01:30 - 02:00 PM	**Lunch**		
02:00 - 02:30 PM	**Session V- Quiz Masters:** Dr. Sheeba Marwah, Dr. Zeba Khanam **Quiz Judges:** Dr. Harsha S. Gaikwad, Dr. Rajesh Kumari (AIIMS)		
02:30 - 04:30 PM	**Session VI- Workshop Five Workshop Stations: 20 minutes each**		
Stations I	Ventilator Setting	Dr. Harish Sachdeva & Team Anaesthesia	
Stations II	CPR	Dr. Sheeba Marwah, Dr. Zeba Khanam, Dr. Sakshi Nischal	
Stations III	Airway Management	Dr. D. S. Meena & Team Anaesthesia, Dr. Aprajita Gupta	
Stations IV	Oxygen & NIV	Dr. Rohit Kumar, & Team Respiratory Medicine, Dr. Akanksha Mohanty	
Stations V	Vasopressors	Dr. Rekha Bharti, Dr. Monika Gupta, Dr. Himal Singla	
04:30 PM	**Quiz Result**		

Advisors
DR. BINDU BAJAJ
DR. ANJALI DABRAL

Organising Secretary
DR. SHEEBA MARWAH

Jt. Organising Secretary
DR. ZEBA KHANAM

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PREVENTIVE ONCOLOGY WORKSHOP

"Organized by Institute of Obstetrics & Gynaecology, Deen Dayal Upadhyaya Hospital, New Delhi"

Date: 4th October 2024
Time : 11:30 - 05:00pm

Venue: Hotel The Lalit, Connaught Place, New Delhi

Chief Guest : Dr. Mala Shrivastava
Guest of Honour : Dr. Pushpa Singh

Organising Chairperson : Dr. Poonam Laul
Convener: Dr. Urvashi Miglani, Dr. Harvinder Kaur
Organizing Secretary: Dr. Ritu Goyal, Dr Richa, Dr. Aishwarya

11:30-11:40 PM	REGISTRATION	
	WELCOME ADDRESS AND INTRODUCTION	
Time	**TOPIC**	**Speaker**
SESSION 1 – Chairpersons: Dr. Sunita Seth, Dr. Sunita Malik, Dr. Sunita Lamba , Dr. Shanti		
11:40-11:50AM	Changing perspectives of Cervical Screening with HPV Tests	Dr. Shalini Aggarwal
11:50-12:000 Clock	The enigmatic HPV tests: Which one to choose	Dr. Rashmi Yadav
12:00-12:10PM	Endometrial and Vulval Cancer Screening: What can be done	Dr. Swasti
12:10-12:20PM	Preventive Strategies for Ovarian Cancer	Dr. Monisha Gupta
Time	**TOPIC**	**Speaker**
SESSION 2 – Chairpersons: Dr. Y. M. Mala, Dr. Suman Lata , Dr. Shashi Raheja		
12:20-12:30PM	HPV vaccination: Recent Updates	Dr. Poonam Laul
12:30-12:40PM	Tissue Basis of Colposcopy and Scoring Systems	Dr. Niharika Dhiman
12:40-12:50PM	Colposcopy Equipment : What's new	Dr. Shweta Balani
12:50-01:00PM	Management of CIN : The underlying principles	Dr. Shruti Bhatia
01:00-02:00PM	**LUNCH**	
Time	**SESSION 3**	
02:00-03:00PM	**Panel Discussion** **Experts** :- Dr. Amita Naithani, Dr. Shweta Giri **Panellists** :- Dr. Ritu Goyal, Dr. Kamna Dutta, Dr. Kanika Batra Modi, Dr. Monika Madaan	**Moderators :-** Dr. Urvashi Miglani Dr. Harvinder Kaur
Time	**TOPIC**	**Speaker**
SESSION 4 – Video Sessions Chairpersons: Dr. Vijay Zutshi, Dr. Indu Chawla, Dr. Veena Acharya, Dr. Reena Yadav		
03:00-03:10PM	Thermoablation	Dr. Nilanchali Singh
03:10-03:20PM	LLETZ	Dr. Shruti Bhatia
03:20-03:30PM	Conisation	Dr. Aruna Nigam
03:30-03:40PM	Vulvoscopy	Dr. Archana
03:40-04:30PM	**Brain teasers : Dr. Ritu Goyal, Dr. Richa Madaan and Dr. Aishwarya Nandakumar**	
04:30-05:00PM	**Hands on Session**	

COURSE HIGHLIGHTS

- SKILL ENHANCING HANDS ON SESSIONS
- CRISP PRECISE DELIBERATIONS ON BASICS
- CASE BASED PANEL DISCUSSION WITH IMPORTANT TAKE HOME MESSAGES
- ENGAGE IN KNOWLEDGE SHARING BY EXPERTS OF THE FIELD
- ENLIGHTENING VIDEO SESSIONS ON PROCEDURES, HIGHLIGHTING TIPS AND TRICKS
- ENGAGING QUIZ FOR INQUISITIVE MINDS

WHO SHOULD ATTEND

- GYNAECOLOGISTS
- POST GRADUATES IN OBSTETRICS AND GYNAECOLOGY.
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