INTROSPECT

VOLUME III

NOVEMBER 2023

E-JOURNAL BY

OGSOS

EDITOR'S NOTE

We are pleased to proudly present to you "INTROSPECT" – Official online journal from Obstetric and Gynaecological Society of Salem (OGSOS), commenced in order to acknowledge and recognize the work done by our very own members.The online media has become a vital component for the dissemination of knowledge and an imperative vehicle for wide access.

With this in mind, the first edition of our E-Journal has been curated meticulously. Our OGSOS has always turned heads, be it academics, conferences, skills, culturals, etc. This is our next step, where our vision has taken shape and this endeavor marks a major milestone in taking our society to greater heights.The objective of this journal is to promote research, share ideas, help in day to day clinical practice and promote a spirit of oneness among us. This would provide an exciting opportunity to showcase our work and share our skills. The journal aspires to be vibrant, engaging and accessible, and at the same time integrative and challenging. It will continue to evolve with fresh ideas and guidance at each step,encouraging debates and discussions.

We hope that this journal will offer ample opportunity to our members to learn about and reflect upon the practices and possibilities and help in their achievements and challenges at work.We are privileged to have the expertise and enthusiasm of our authors and believe that every member will play a pivotal role in leading the journal through the exciting phase of its development. Finally we remain very grateful to our President, Vice President, Secretary and Patrons for constant encouragement and guidance. Let us all join together in solidarity and introspect our ideas, thoughts and practices,with the aim of better practices and better outcomes, following the footsteps of our seniors and setting examples for those next in line.

HAPPY LEARNING!

DR. KAVITHA NAGARAJAN,
MD OG, FRM, MRCOG, MICG.,

DR. ANUREKHA J P,
MD, DNB, FRM, FICOG

DR. MADHUMITHA ARUNKARTHIK
MS, DNB, FRM, FMAS.

PRESIDENT'S NOTE

Greetings from the desk of the President of OGSOS! It is indeed a proud moment to be in this chair amidst our highly talented and esteemed members!

CHANGE is the only CONSTANT thing in this world. Likewise, Medical practice is something that keeps changing with newer inventions, interventions and evidence based modalities. So, it is inevitable for us to keep up with the trend, update our knowledge and enhance our clinical skills especially in this era, where patients are Google doctors with first hand information. We try hard to update ourselves by attending conferences, CMEs, reference articles and juggle between busy practice and family needs.

With our team of Editors, it is our maiden effort to bring out an E-journal every 4 months authored by our very own members. Our aim is to provide evidence based protocols, interventions and practical points needed for our day to day practice. My vision is to bring near uniform practice amongst us which is evidence based, for the benefit of our women to get standard treatment. Evidence based practice and following guidelines protect us legally too.

We have tried to cover all subspecialities with the experts in each. Hope our efforts help you in your practice. We are open to any suggestions to improve our quality and content of the journal.

I thank my team of council members who share responsibility and for their sincere efforts in all our proceedings. My heartfelt gratitude to all the enthusiastic authors for their contribution to the first edition of our journal!

My sincere thanks to my team of editors for their enthusiasm and hardwork shown in bringing out this journal!

Dr. G. JAYAMALA,

DOWH (IRE), MRCOG (UK), MRCPI (OG)., DRM.,

CONSULTANT, RAINBOW HOSPITAL

SECRETARY'S NOTE

Greetings and welcome to the first E-Journal of Obstetric and Gynaecological Society of Salem. I am honored to be the Secretary of our OGSOS family and I take this opportunity to thank our society members for their love and confidence on me and look forward to our continued teamwork to achieve greater excellence.

It's our proud moment in releasing the very first E-Journal of OGSOS and the credits are deeply shared by all the members of our OGSOS family. I am deeply obliged to Dr.G.Jayamala, the President of OGSOS who was the brain behind this baby.

My special thanks to the Journal committee members who played tremendous role in this beautiful compilation. In the months to come let us all join hands in making this E-Journal grow with impact factor and achieve its position among the indexed journals. For this, I kindly encourage all the OGSOS society members to actively contribute with original articles.

The culmination of our efforts in bringing out this first E-Journal shall lay the fundamental foundation of our society in uplifting the academic wing and thereby benefitting our society members by constant updation and knowledge upgradation. I believe that continued stability is dependent on continued support of its members and therefore I would encourage all members to actively participate and contribute to the upcoming issues.

LONG LIVE OGSOS!

Dr. L. SHANMUGAVADIVU, MD., (OG)

ASSOCIATE PROFESSOR, DEPARTMENT OF OG,

GMKMCH

THE OBSTETRIC AND GYNAECOLOGICAL SOCIETY OF SALEM

Dr.G.JAYAMALA
President OGSOS

Dr.SARAVANA KUMAR
VICE PRESIDENT - OGSOS

Dr.L.SHANMUGAVADIVU
Secretary OGSOS

Dr.SURESH KRISHNAAMOORTHI
Hon.TREASURER - OGSOS

Dr. DHAVASHREE V
JOINT SECRETARY - OGSOS

EXECUTIVE COUNCIL MEMBERS

JOURNAL EDITORS

DR. KAVITHA NAGARAJAN,
MD OG, MRCOG, FRM, MICG.,

DR. ANUREKHA J P,
MD OG, DNB , FRM, FICOG.,

DR. MADHUMITHA ARUNKARTHIK
MS, DNB, FRM, FMAS.,

OUTREACH PROGRAMMES

DR. K. SUNDARA MEENAKSHI
MS OG, FICS.,

DR. P. SATHYA SUDHAKAR
DGO, DRM.,

DR. G. KIRANA SELVI,
MS OG, FMAS, DRM, FICS.,

SCIENTIFIC COMMITTEE

DR. D. NARMADA
MD OG.,

DR. ESAI AMUTHU
DGO, DNB, DRM.,

DR. ASHWIN RAO
MS, FRM, FMAS, PGDMLS.,

WEBSITE MAINTENANCE COMMITTEE

DR. G. DHIVYA,
DGO, DNB, MRCOG, DMAS, CIMP, MNAMS.,

DR. ARUNITA NANDY GOUTHAM
MS OG , FMAS, DRM.,

MTP COMMITTEE

DR. R. SUGANTHI
MD OG, DNB, MRCOG.,

DR. P. SATHYA SUDHAKAR
DGO, DRM.,

TNMC CREDIT POINTS COORDINATORS

DR. R.M. SORNAM
MD OG, Dip IBLM.,

DR. K. JEYALAKSHMI
DGO, DNB, MRCOG.,

NEW MEMBERS MOBILISING COMMITTEE

DR. ARUNITA NANDY GOUTHAM,
MS OG , FMAS, DRM.,

DR. D. PALLAVI
MD OG, FRM, DRM.,

ACADEMIC CO-ORDINATOR

DR. G. PREMAPRIYA
MS OG,, DNB., MNAMS., MRCOG.,

CONTENTS

MORE PRETERM & EXTREMELY LOW BIRTH WEIGHT BABIES NOW SURVIVE. 1

LABOUR ANALGESIA – RECENT ADVANCES 17

EFFECTIVE STRATEGIES TO PREVENT PRETERM LABOUR IN TWIN GESTATION 25

SOCIAL EGG FREEZING - THE DAWN OF A NEW ICE AGE 41

MANAGING IVF PREGNANCIES 52

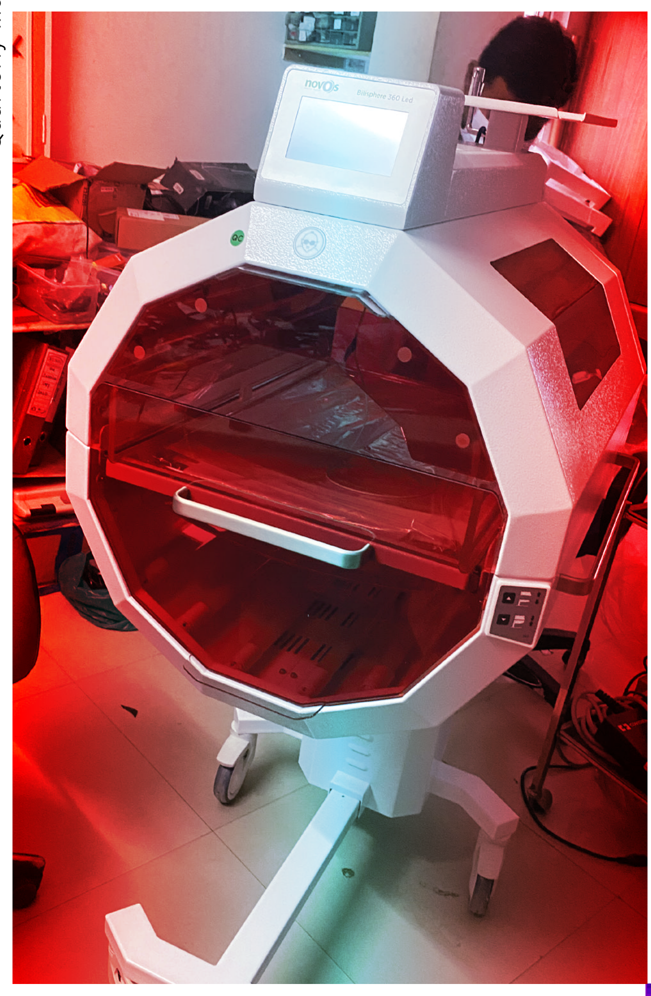
STILLBIRTH AT 36 WEEKS - WHAT NEXT? .64

GENDER IS BETWEEN YOUR EARS AND NOT BETWEEN YOUR LEGS 70

MORE PRETERM & EXTREMELY LOW BIRTH WEIGHT BABIES NOW SURVIVE.

Dr. S. RAMAKRISHNAN,
MRCPCH(UK)., DCH(UK)., MRCP(Ire).,
SENIOR CONSULTANT IN PAEDIATRICS & NEONATOLOGY
SKS HOSPITAL & PGMI

Survival alone is not sufficient. A very good quality of life following survival is the key. International standard state of art neonatal care is crucial.



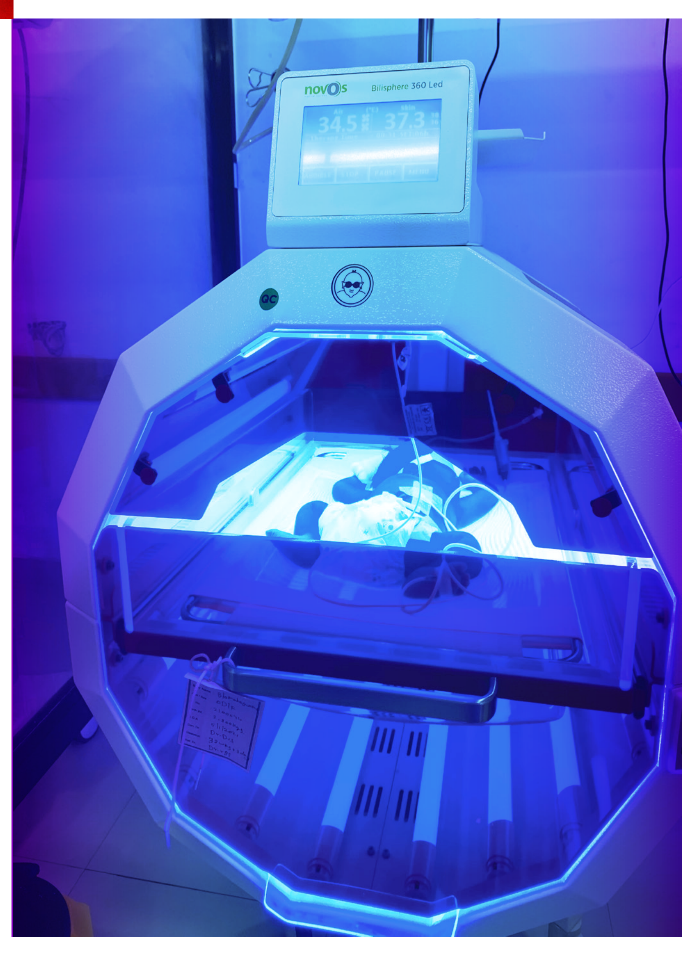
BILISPHERE.

360 DEGREE INTENSIVE PHOTOTHERAPY

WHY IS THIS DEVICE SO SPECIAL?

Conventional phototherapy treats mild to moderate neonatal jaundice. However, we need intensive phototherapy to rapidly reduce very high bilirubin concentrations in order to prevent bilirubin induced neuronal damage (BIND)/Kernicterus.

We use a novel very intensive phototherapy "Bilisphere" which provides 360 degree skin exposure at a very high irradiance (Intensive Phototherapy), above 30 W/cm2/nm, and effectively brings down bilirubin concentrations very swiftly.



SLE 6000 NEONATAL VENTILATOR WITHHFOV, HFNC & NIV

Why is this device special?

It is very baby friendly and offers precise lung protective ventilation strategies. Accurate measurements of baby's tidal volumes by a special hot wire anemometer flow sensor enables the state of art volume targeted ventilation for all neonates. Also, various non invasive modes (NIV) including HFNC (heated humidified high flow nasal cannula oxygen therapy) enables easy and early weaning.

FACILITATES EARLY DISCHARGE WITH REDUCED CHRONIC LUNG DISEASE DUE TO LUNG PROTECTIVE VENTILATION

OXYGENIE - ATTACHED TO SLE 6000 VENTILATOR

WHAT IS OXYGENIE?

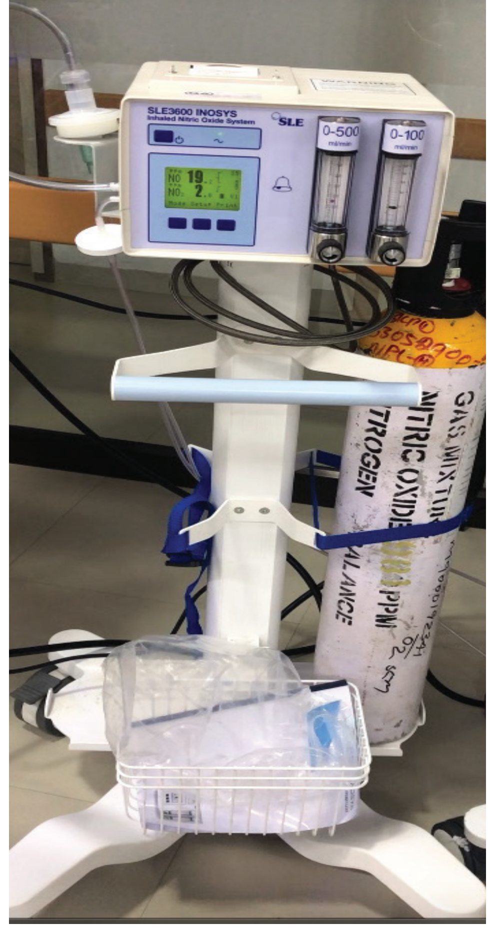
Oxygenie is a novel, sophisticated software algorithm installed in advanced neonatal ventilators like SLE 6000 which utilises the principles of closed loop automated oxygen control (CLAC). It automatically adjusts the oxygen supply on the ventilator based on the baby's peripheral oxygen saturation with an aim to keep it within the target range with less manual intervention. Various studies have shown that closed loop automated oxygen control (CLAC) maintains peripheral saturation within target range 78 to 81% of the times, thus significantly minimising the adverse effects of oxygen therapy like Retinopathy of prematurity (ROP) and chronic lung disease (CLD/BPD).

INHALED NITRIC OXIDE

WHY IS THIS THE BEST FOR PPHN?

Sildenafil is widely popular for PPHN. But sildenafil may not be effective when the pulmonary hypertension (PPHN) is very severe. Occasionally, sildenafil not only reduces pulmonary artery pressure, it reduces systemic blood pressure thus making the condition worse. Inhaled nitric Oxide (iNO) is a very selective pulmonary artery dilator and does not have any systemic side effects like hypotension.

Currently, it is the drug of choice for PPHN in neonates.



CONTINUOUS NON INVASIVETRANSCUTANEOUS CO2 AND O2 SENTEC DEVICE

Ventilated babies require regular blood gas analysis to ensure they are not over ventilated. Also, excess FiO2 administration is dangerous, which requires close monitoring by blood gas analysis. Blood gas analysis is an invasive procedure and does not provide continuous blood oxygen and CO2 status.

WHY CO2 MONITORING IS VITAL?

It is mandatory to monitor carbon dioxide (CO2) concentrations in any baby receiving invasive or non-invasive ventilation. We monitor this by a SENTEC device as shown in the picture. Over ventilation causes CO2 washout. Low CO2 results in cerebral vasoconstriction. Reduced cerebral blood flow secondary to low CO2 is associated with brain damage. Similarly, targeting O2 minimises oxygen induced free radical injury like ROP and Bronchopulmonary dysplasia (BPD/CLD).

BY CONTINUOUSLY MONITORING O2 & CO2 AND TARGETING CO2 BETWEEN 30-45 MM HG IMPROVES NEURODEVELOPMENTAL OUTCOMES.

CONTINUOUS NON INVASIVE ELECTRICAL CARDIOMETRY - ICON DEVICE.

The practise of randomly deciding which inotrope to treat neonatal hypotension is outdated. Neonatal functional echocardiography provides bedside information on pre-load, contractility and after-load. Based on this, the right inotrope is chosen. This is complimented by continuous non-invasive electrical cardiometry.

WHAT IS ELECTRICAL CARDIOMETRY AND HOW USEFUL IT IS?

Distance travelled and resistance faced by very low dose electric current varies in systole and diastole based on the orientation of the red blood corpuscles. This information is analysed by complex machine learning algorithms and key information like cardiac Index (CI), systemic vascular resistance (SVR) and Thoracic fluid content (TFC) is calculated and displayed. This helps us to chose the right blood pressure management strategy.

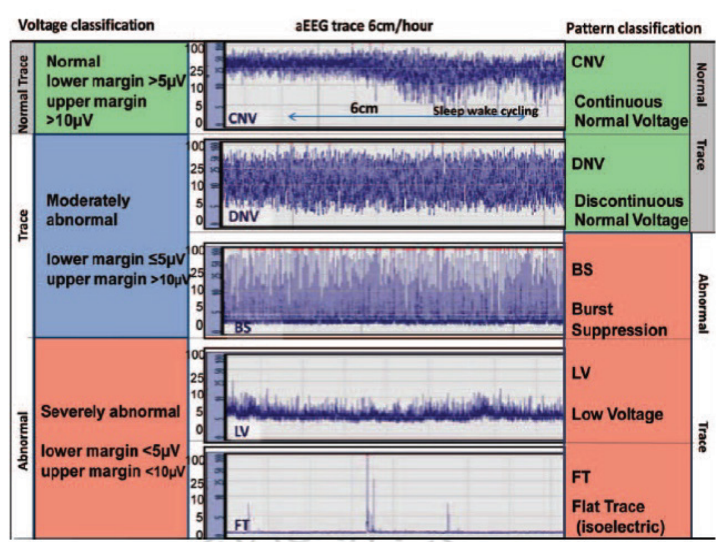
Excellent Neonatal blood pressure management is achieved by continuously monitoring pre-load, contractility and after-load utilising an ICON device

CRITICOOL - WHOLE BODY HYPOTHERMIA

WHY IS THIS DEVICE SPECIAL?

Total body hypothermia is the only approved, standardised therapy for hypoxic ischaemic encephalopathy. Not offering therapeutic hypothermia to babies who meet the criteria may result in medico-legal consequences. Criticool device is fully automated, servo controlled and achieves excellent target rectal temperature. The slow rewarming phase over 6 hours at approximately 0.5 to 1 C per hour is very essential in promoting neurodevelopment. Automated servo controlled therapeutic hypothermia results in achieving better target saturation and controlled re-warming thus minimising secondary brain

CEREBRAL FUNCTION MONITOR (CFM)



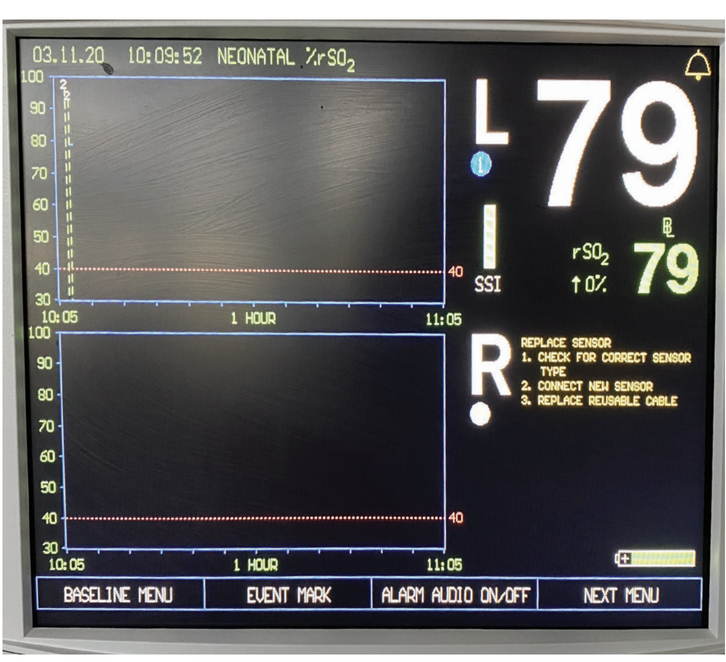
AMPLITUDE INTEGRATED EEG

WHY IS THIS DEVICE SPECIAL?

Brain activity monitoring is very important to improve neurodevelopment outcome. Particularly, in babies with hypoxia or seizures, sub clinical seizures further damage the brain and sometimes the babies survive with severe neurological sequel. aEEG/CFM enables detection of subclinical seizures and initiate adequate early therapy thereby minimising or abolishing further cerebral damage. Similar to routine saturation monitoring, bedside brain monitoring is very essential in NICU

CFM/AEEG FACILITATES EARLY DETECTION AND TREATMENT OF SEIZURES. PROMOTES NEURO PROTECTIVE MONITORING, THERAPY & PROGNOSTICATION.

NEAR INFRARED SPECTROSCOPY (NIRS)

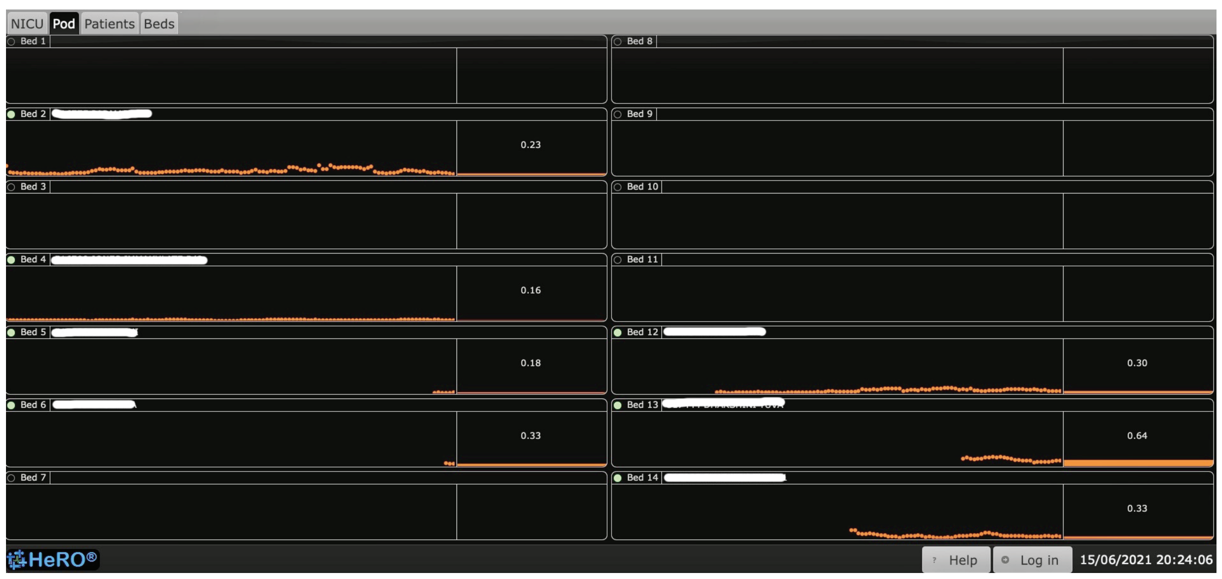


WHY IS IT IMPORTANT?

Monitoring peripheral tissue oxygen saturation by a pulse oximeter (SpO2) alone is not sufficient. It is important to know the regional saturation (rSO2) of organs like brain, intestines and kidneys. These organs are most affected in many neonates and only continuous monitoring would result in adequate and targeted treatment.

NEAR INFRARED SPECTROSCOPY (NIRS) DEVICEMEASURESREGIONAL ORGAN SATURATION AND FRACTIONAL TISSUE OXYGEN EXTRACTION. ORGAN SPECIFIC MONITORING & THERAPY WOULD BE INITIATED IF SUBOPTIMAL RSO2 < 55%.

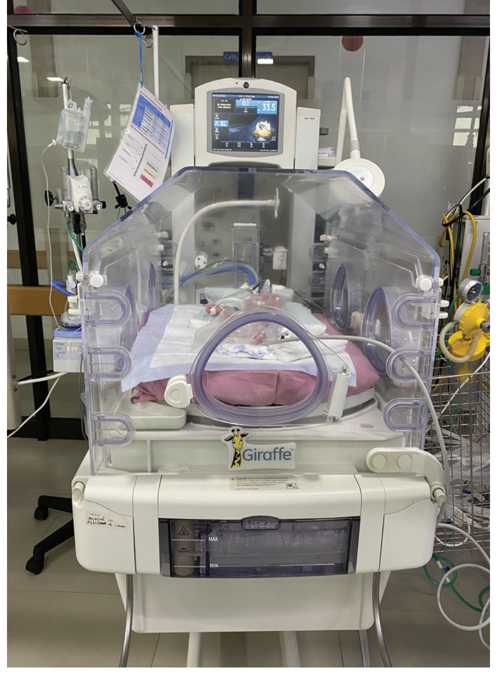
HERO MONITOR AN EARLY WARNING PREDICTIVE TOOL FOR NEONATAL SEPSIS



WHAT IS HERO MONITOR?

Is a non-invasive, continuous risk assessment for infection that's is proven to reduce VLBW sepsis mortality by 40%. Heart Rate Characteristics (HRC). SKS servers continuously extracts and stores every heart beat of each neonate from their respective multi-para monitors. It generates a HeRO score ranging from 0 - 7. A high score reflects a high probability that a neonate would be diagnosed with sepsis in the next 24 Excellent in predicting neonatal sepsis, by monitoring HeRO scores, neonatologists could intervene earlier and save lives effectively.

NEONATAL INCUBATORS



WHY DO WE NEED INCUBATORS?

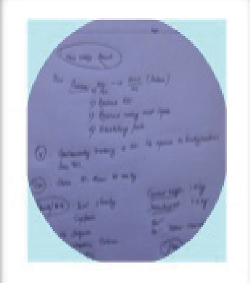
Babies born below 30 weeks gestation and less than 1.5 kg suffer from excessive trans-epidermal water loss associated with problems like excessive weight loss, hypernatremia when they are nursed in open care warmer. Excess fluid intake to compensate for this results in over circulation through PDA and its consequences. Incubator care with adequate humidification reduces trans-epidermal water loss, improving thermoregulation in these vulnerable babies. Quality thermoregulation is very essential in preterm care. Inadequate thermo regulation is associated with morbidity and mortality.

4 JUNE 2021

Internet of Medical Things

IoMT in the NICU

Paper Records
Data analysis is difficult

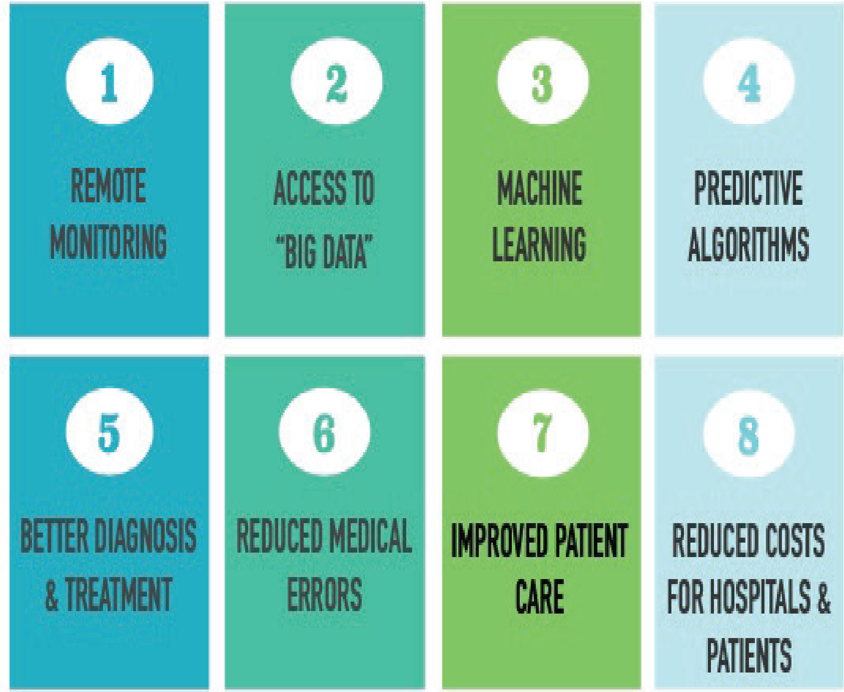


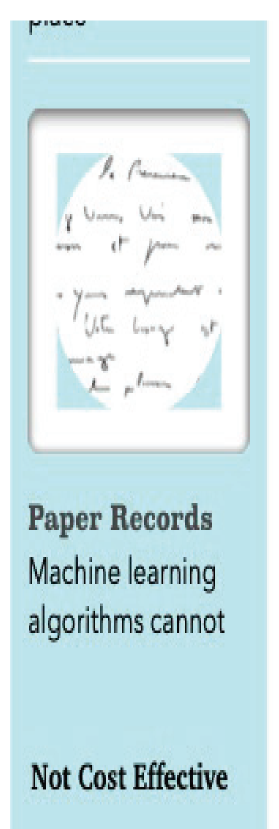
Paper records
Warning systems cannot be put in place

What is the Internet of Medical Things? (IoMT)

It is an amalgamation of **medical devices, healthcare software and information technology systems** that are connected together and networked together.

IoMT in NICU! - Why do we need it?

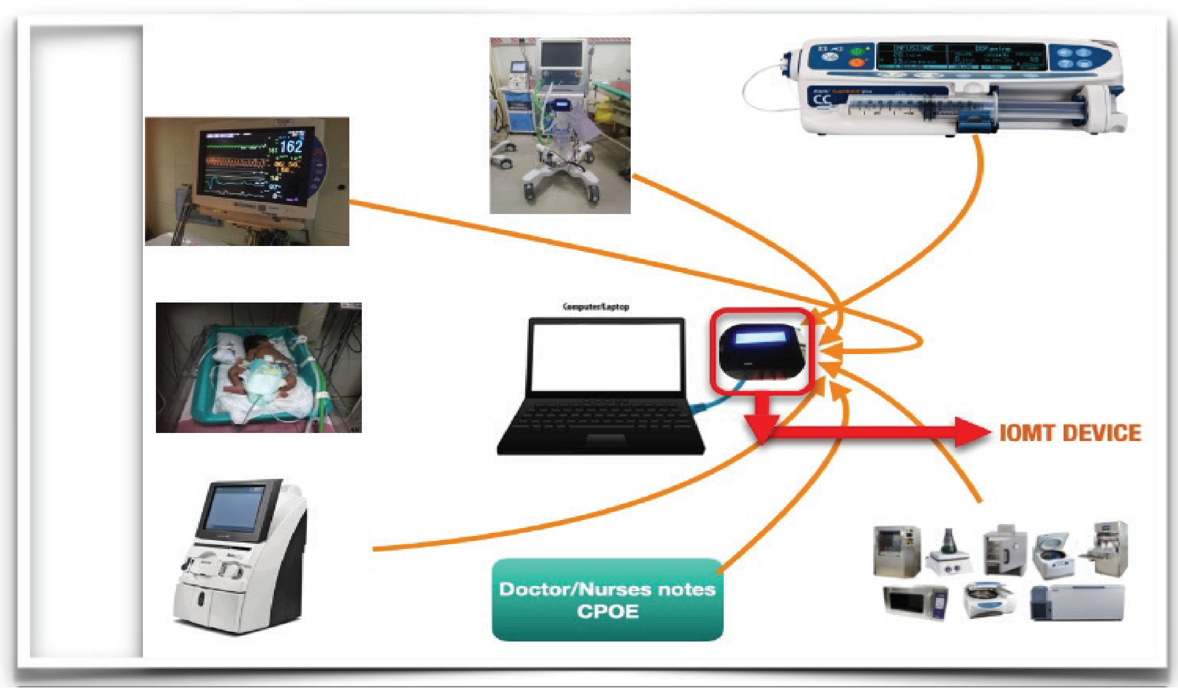




DEPARTMENT OF PAEDIATRICS & NEONATOLOGY.

THE CONCEPT

"All the medical devices are connected to the IoMT device which collects data and stores it in hospital servers, which then can be accessed through the NICU charting and EMR software".



NO MORE PAPER RECORDS

AUTOMATIC ENTRY OF NURSES OBSERVATIONS

PATIENT DATA CAPTURED & STORED EVERY SECOND

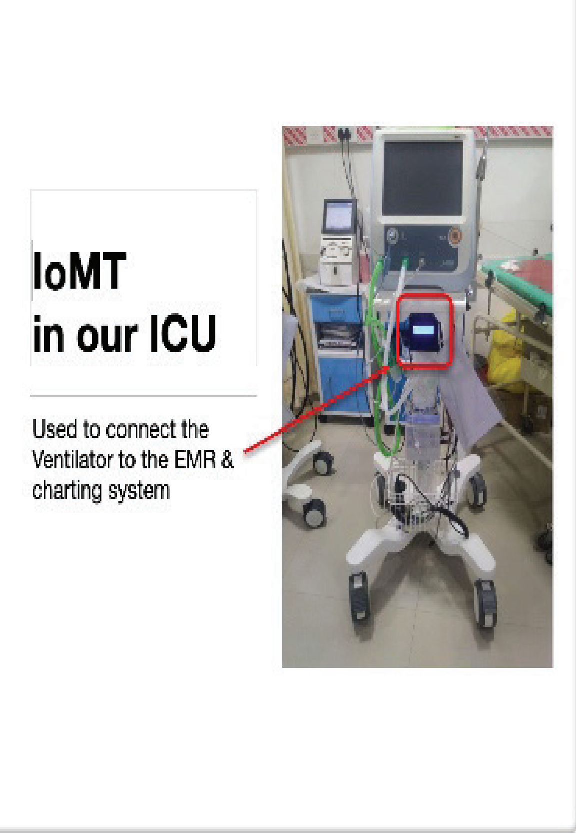
AVAILABLE FOR MACHINE LEARNING & DEVELOP PREDICTIVE MONITORING

DATA AVAILABLE TO IMPLEMENT PATIENT SAFETY MEASURES

IoMT IN OUR NICU

IoMT device connected to an SLE 6000 ventilator

This seamlessly collects all the ventilator settings and delivers it to our neonatal software designed by Neonatologists for Neonatologists



PAPERLESS MEDICAL DOCUMENTATION

Heart Rate (Beats/Min)	134	137	131	94	117	103	118	137	140	139	140	142	141	153	157	151	155	140	158	139	160	151	145	153
RR(measured) (RR/Min)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuff Systolic BP (mm Hg)	62	79	74	68	-	-	-	71	77	74	74	74	63	69	70	68	68	71	71	70	66	-	-	68
Cuff Diastolic BP (mm Hg)	35	36	46	43	-	-	-	46	46	49	33	50	39	42	43	40	37	44	42	42	19	-	-	48
Cuff Mean BP (mm Hg)	42	47	56	50	-	-	-	53	54	56	51	55	46	49	51	48	49	53	51	50	41	-	-	52
Arterial Systolic BP (mm Hg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arterial Diastolic BP (mm Hg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arterial Mean BP (mm Hg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Preductal SaO2 (%)	91	90	97	100	81	87	94	90	94	96	89	90	95	98	95	100	94	97	98	100	95	95	96	93
Postductal SaO2 (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfusion Index (%)	0.59	0.96	0.83	0.82	0.73	1.12	1.03	0.94	0.94	0.94	0.85	0.76	1.03	0.85	0.86	0.95	1.30	1.15	0.79	0.89	1.07	1.07	0.94	1.02

DIGITAL DISPLAY OF BABY DETAILS BY THE SIDE OF EACH BABY.

B/O

MRN :
IP No:
DoB : 13 Days
DoA : 02/01/2021 06: 15 12 Days

HeRO® Score 0.36

1. IUGR
2. RDS
3. PDA
4. Early Onset Sepsis
5. Grade 1 IVH
6. Jaundice
7. NEC
8. Hypocalcaemia
9. Hypoglycaemia
10. Seizures
11. Rh incompatibility
12.

Gestation : 28
Corrected: 28+6

Weight
At birth : 1,000g
Current : 950g
Working: 900g

Mother: O–ve
Baby : A+ve
DCT : Positive
Haemolysis: Yes

	HR	RR	SpO_2 (%)	BP (mmHg)	Temp (°F)
High	190	35	100	65/45(50)	99.2
Median	140	30	93	–	98.6
Low	120	25	90	50/35(40)	98.1

Respiratory Support – 6 days
Mode: HFOV
FiO_2 : 70%
MAP : 12
Δ P : 35
Freq.: 10
TTV : 3ml/kg

Inhaled NO : Yes
Hypothermia: No
Intensive PT : No

$tcpCO_2$: 45
$tcpO_2$: 85
NIRS 1 : 75%
NIRS 2 : 68%

TFC: 45
FTC: 287
SVV: 16%

CI : 0.32
SI : 2.15
ICON: 88
SVRI: 10,447

CPI : 0.32
STR: 2.15
VIC : 88

Total intake : 225ml
IV fluids : 150ml
Milk : 50ml
Drugs : 10ml
Products : 15ml
Fluid Δ : +25ml

Total Output : 200ml
Urine : 150ml
Aspirates : 25ml
Drains : 20ml
Blood : 5ml
Stool frequency: 5

Room 3

13th January - 19:58

Cot 32

B/O

MRN :
IP No:
DoB : 13 Days
DoA : 02/01/2021 06:15 12 Days

HeRO® Score 0.36

1. IUGR
2. RDS
3. PDA
4. Early Onset Sepsis
5. Grade 1 IVH
6. Jaundice
7. NEC
8. Hypocalcaemia
9. Hypoglycaemia
10. Seizures
11. Rh incompatibility
12.

Gestation : 28
Corrected: 28+6

Weight
At birth : 1,000g
Current : 950g
Working: 900g

Mother: O–ve
Baby : A+ve
DCT : Positive
Haemolysis: Yes

	HR	RR	SpO_2 (%)	BP (mmHg)	Temp (°F)
High	190	35	100	65/45(50)	99.2
Median	140	30	93	–	98.6
Low	120	25	90	50/35(40)	98.1

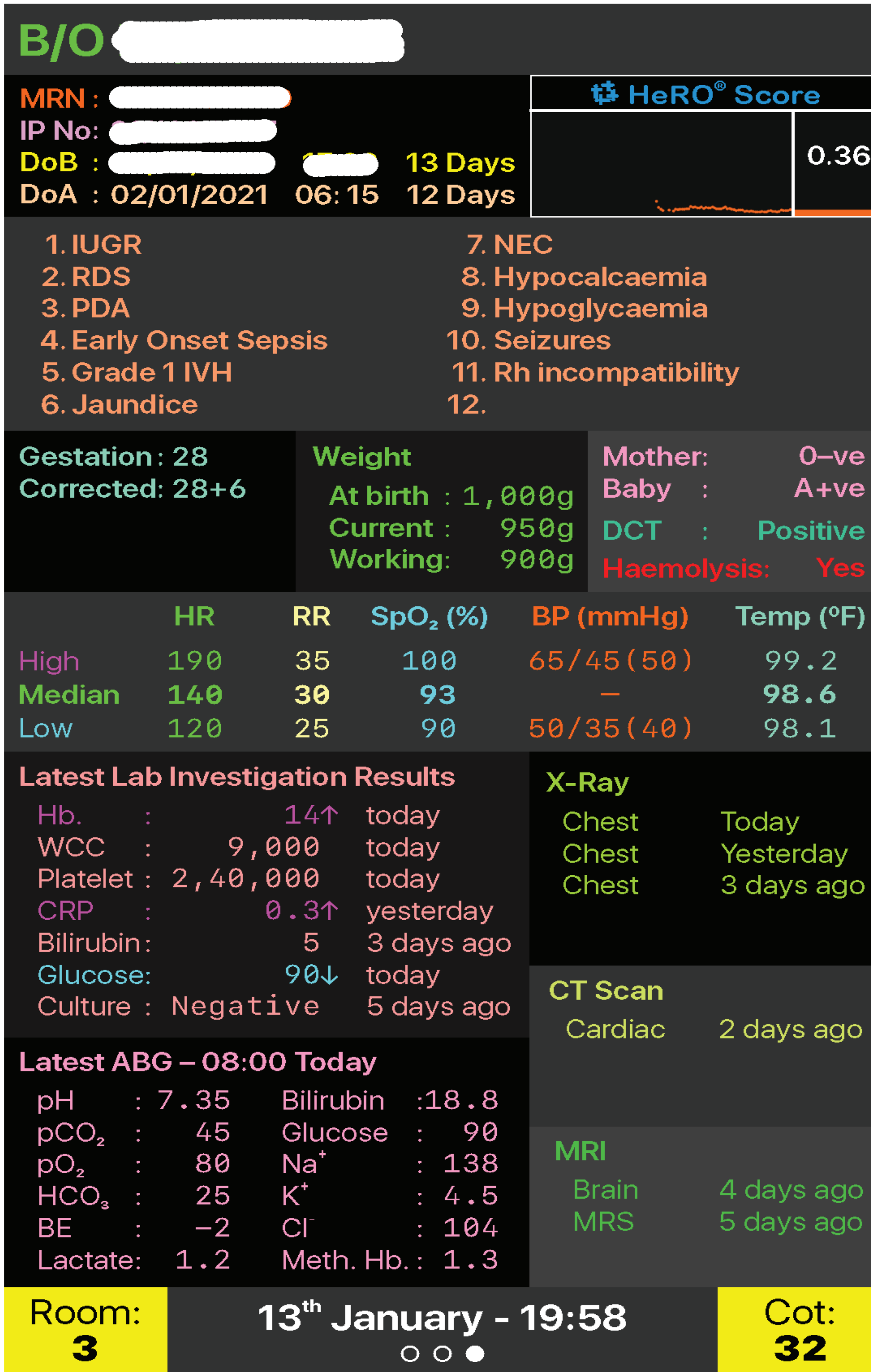
Current Medications

1.	10% Dextrose	12.0ml/h	16.	10% Dextrose	12.0ml/h
2.	Dopamine	0.2ml/h	17.	Dopamine	0.2ml/h
3.	Dobutamine	0.2ml/h	18.	Dobutamine	0.2ml/h
4.	Noradrenaline	0.1ml/h	19.	Noradrenaline	0.1ml/h
5.	Sildenafil	2.5ml/h	20.	Sildenafil	2.5ml/h
6.	Vancomycin	0.2ml/h	21.	Vancomycin	0.2ml/h
7.	Morphine	0.2ml/h	22.	Morphine	0.2ml/h
8.	Vercuronium	0.2ml/h	23.	Vercuronium	0.2ml/h
9.	Ampicillin	100mg BD	24.	Ampicillin	100mg BD
10.	Amikacin	15mg OD	25.	Amikacin	15mg OD
11.	Fluconazole	8mg/72h	26.	Fluconazole	8mg/72h
12.			27.		
13.			28.		
14.			29.		
15.			30.		

Room: 3

13th January - 19:58

Cot: 32


B/O
MRN :
IP No:
DoB :
13 Days
DoA : 02/01/2021 06: 15 12 Days
HeRO® Score
0.36
1. IUGR
2. RDS
3. PDA
4. Early Onset Sepsis
5. Grade 1 IVH
6. Jaundice
7. NEC
8. Hypocalcaemia
9. Hypoglycaemia
10. Seizures
11. Rh incompatibility
12.
Gestation : 28
Corrected: 28+6
Weight
At birth : 1,000g
Current : 950g
Working: 900g
Mother: O–ve
Baby : A+ve
DCT : Positive
Haemolysis: Yes
HR RR SpO₂ (%) BP (mmHg) Temp (°F)
High 190 35 100 65/45(50) 99.2
Median 140 30 93 – 98.6
Low 120 25 90 50/35(40) 98.1
Latest Lab Investigation Results
Hb. : 14↑ today
WCC : 9,000 today
Platelet : 2,40,000 today
CRP : 0.3↑ yesterday
Bilirubin : 5 3 days ago
Glucose: 90↓ today
Culture : Negative 5 days ago
X-Ray
Chest Today
Chest Yesterday
Chest 3 days ago
CT Scan
Cardiac 2 days ago
Latest ABG – 08:00 Today
pH : 7.35
pCO₂ : 45
pO₂ : 80
HCO₃ : 25
BE : −2
Lactate: 1.2
Bilirubin :18.8
Glucose : 90
Na⁺ : 138
K⁺ : 4.5
Cl⁻ : 104
Meth. Hb. : 1.3
MRI
Brain 4 days ago
MRS 5 days ago
Room: 3
13th January - 19:58
Cot: 32

SKS CHILD DEVELOPMENT CENTRE

FACILITIES AVAILABLE

- Developmental supportive care for babies in NICU
- Lactation support by qualified lactation consultants
- Newborn metabolic screening
- Retinopathy of prematurity screening
- Universal hearing screen (OAE & BERA)
- Confirmatory BERA for selective babies
- Detailed neurodevelopment follow up of high risk babies
- Developmental Screening Test (DENVER - DDST II)
- Hammersmith neonatal and infant neurological examination
- Bayley scales of infant development
- Developmental assessment scales for Indian infants (DASII)
- Modified Checklist for autism in toddlers - MCHAT
- CBCL (Child behaviour checklist)

“Not just survival.
Quality of survival matters the most !!”

LABOUR ANALGESIA – RECENT ADVANCES

Dr. M. SATHYAPRAKASH,
DA, DNB, (ANAESTHESIA)
HOD OF ANAESTHESIA DEPARTMENT
SKS HOSPITAL & PGMI

INTRODUCTION

- Advances in the field of labor analgesia have tread a long journey from the days of ether and chloroform in 1847 to the present day practice of comprehensive programme of labor pain management using evidence based medicine.
- The delivery of infant into the arms of a conscious and pain free mother is one of the most exciting and rewarding moments in medicine. = MOIR.
- The International Association of study of pain (IASP) declared 2007 – 2008 as "Global year against pain in Women".
- The National Health Services maternity statistics of 2005 – 2006 in the UK reported that one third of the parturients chose epidural analgesia.

METHODS OF PAIN RELIEF IN LABOUR

Non Pharmacological methods

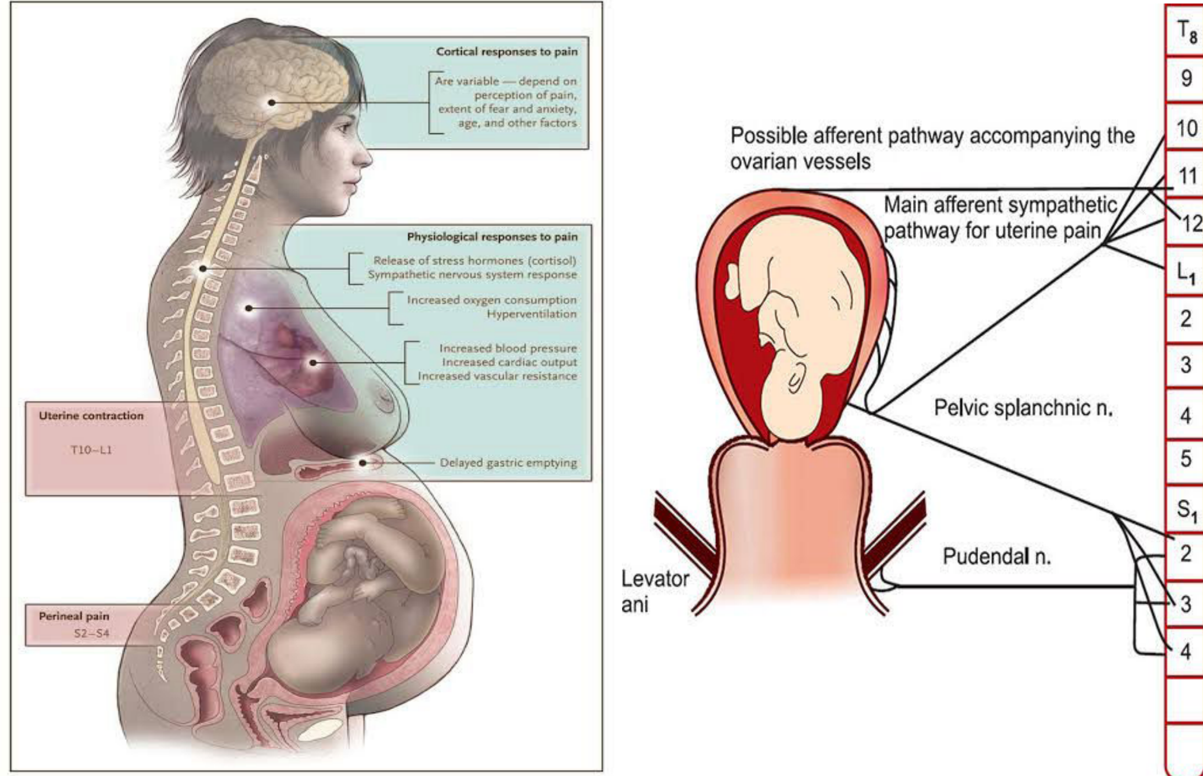
- Transcutaneous electrical nerve stimulation, continuous support in labor, touch and massage, water bath, intradermal sterile water injections, acupuncture and hypnosis, all may be beneficial for the management of pain during labor.
- No proven scientific data analysis of the quality of pain relief offered by these techniques.

Parenteral Narcotics

- Systemic opioids → widely used medications for labor analgesia.

Pethidine

- Opioid agonist
- Its effect on progress is contentious
- Not used in cervical dystocia patient



Ketamine

- Used for labor pains
- Not a safe drug → patient may require anesthetic dose which may compromise Airway

Fentanyl

- Lipid soluble synthetic opioid – 100 times potent than morphine and 800 times potent than pethidine.
- Onset of action 1-3 minutes and short duration of action.
- Bolus – 25 to 50 mcg every hour.
- Continuous infusion → 0.25 mcg / kg / hour

Tramadol

- Synthetic opioid low affinity for mu receptor
- 10 % more potent than morphine .
- No clinically significant respiratory depression of usual dose of 1-2 mg / kg body weight .

Butorphanol

- Opioid with agonist - antagonist properties resemble those of pentazocine

- Offers analgesia with sedation
- Dose 2-4 mg IM
- Produce respiratory depression – not frequently used for
- labour analgesia.

Remifentanil

- Ultra short acting synthetic opioid .
- Half life - 6 min most preferred for infusions
- Dose bolus – 20mcg with interval of 3 minutes.
- Infusion dose 0.025mcg / kg /min.
- Side effect : maternal hypoventilation / desaturation less than 94%

OPIOID ANTAGONIST

Naloxone: used for reversing the neonatal effect of maternal opioid administration.

- Dose 0.1ml/ kg to newborn intravenous route
- Reversing maternal respiratory depression dose - 0.4 mg IV

REGIONAL ANALGESIA IN LABOUR

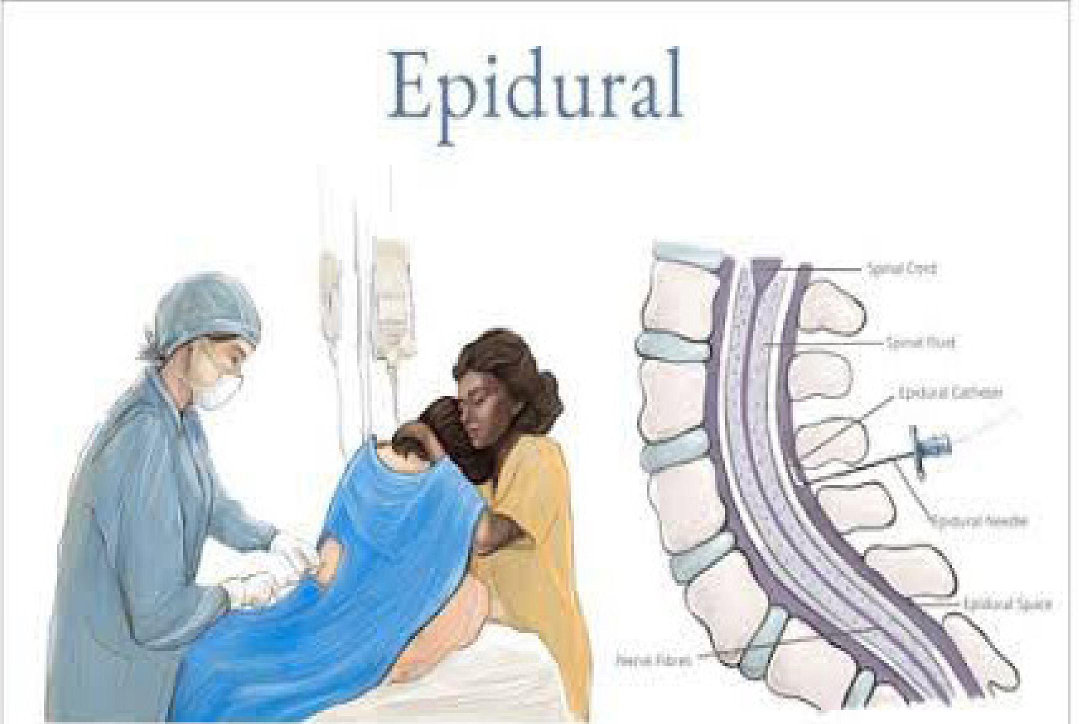
- Most versatile and gold standard technique for pain control in obstetrics.
- Recent advances

Technical

- Combined spinal epidural analgesia (CSEA)
- Continuous spinal analgesia using microcatheters
- Ambulatory epidurals, concept of minimal local anaesthesia dose and volume

PHARMACOLOGICAL

- Ropivacaine, Levobupivacaine
- Sufentanil remifentanil
- Clonidine and Dexmedetomidine



TECHNOLOGICAL

1. Availability of ultrasound to facilitate localisation of epidural space

2.Patient-controlled epidural analgesia regimes

CSEA

- It is a continuous rapid reliable onset of profound analgesia resulting from spinal injection with flexibility and longer duration of epidural technique.
- CSEA kit spinal needle is a fine pencil -point needle with locking device that minimizes postdural puncture headache and failed spinals.
- Spinal opioids provides immediate analgesia without any motor block producing ambulatory block.
- Associated with more patient satisfaction
- No difference between CSEA and epidural
- Side effects -pruritus, nausea / vomiting , hypertension, uterine hyperstimulation and fetal bradycardia

CSEA indicated in

- Very early stage of labour
- Advanced stage of labour
- Difficult epidural

Low does epidural regimens

- Traditionally, high concentration (0.2-0.25%) of local
- anesthetic was been to used to maintain labour analgesia
- Now lower concentration (0.0625-0.125%) of local anesthetics are used that lowers the incidence of motor block and toxicity
- COMET (combined obstetric mobile epidural trial) resulted in significantly higher vaginal delivery.

Maintenance of intrapartum neuraxial analgesia

- Performed by intermittent manual boluses or through patient controlled or continuous epidural infusion pumps.
- Continuous epidural infusion of dilute local anesthetic with opioids
- Continuous dilute low dose mixtures 0.0625% Bupivacaine with 2mcg/ ml of fentanyl infusion at 10- 12ml/hr.
- This provides better pain relief but at cost of more numbness and motor blockade and more break through top ups.

PCEA

- Patient controlled epidural analgesia is useful alternative for maintenance regimen.
- 5ml bolus , 15 minutes lockout interval resulted in less local anesthetics consumption but increased breakthrough pain , higher pain scores and lower maternal satisfaction when compared with PCEA with 5ml bolus , 10-12 min lockout interval and 5-10ml/ hr infusion.
- Computer integrated PCEA that controls background
- Infusion rate according to previous low demand bolus .

CONTINUOUS SPINAL ANALGESIA AND MICROCATHETERS

- FDA has restricted the use of spinal microcatheters due to association with cauda equina syndrome .
- But a study concluded that use offentanyl and bupivacaine via 28-G catheter the incidence of neurological complication is less than1% and produces better initial pain relief and higher maternal satisfaction.
- Disadvantage is that of the technical difficulties
- Using single shot spinal analgesia using intrathecal morphine [300-400mcg] with local anesthetic is a method that was used but disadvantage is that analgesia is not satisfactory during advanced stage of labour and increase incidence of nausea and pruritus.

Inhalation method

- Nitrous oxide (entonox)
- 50:50 mixtures O2 and nitrous oxide
- But not very potent analgesic

Sevoflurane

- commonly used during general anaesthesia
- short onset and offset of action
- concentration of 0.8% with oxygen.

SIDE EFFECT

- loss of protective airway reflexes

NEWER INSIGHTS IN TO THE MYTHS & CONTROVERSIES

- Increased rate of operative & Instrumental delivery: Is epidural the cause ?
- Studies shows that there is no direct relationship of epidural & increased
- C-section
- Neural analgesia prolong the duration of labour on an average by 1 Hour.
- Use of low dose mixture reduces the overall incidence of undesirable adverse effect.
- Timing of epidural during labour (Early Vs Late)
- Higher rate of cesarean delivery when epidural in initiated early in labour.
- Epidural analgesia may be delayed with a cervical dilation of 4-5 cm Recent studies concluded that no need to wait arbitrarily till the cervical dilation has reached 4-5 cm

MATERNAL REQUEST IS A SUFFICIENT INDICATION FOR PAIN RELIEF IN LABOUR

- Passive descent should be encouraged along with delayed & monitored pushing during birth to safety & effectively increase spontaneous vaginal birth, decrease instrumental delivery & shorter the pushing time.
- With holding epidural top-up in 2nd stage of labour
- No statistically significant instrumental delivery rate in patients who continued epidural in 2nd stage of labour.
- No statistically significant increase in inadequate pain relief when epidural was stopped.

Newer local anesthetics & adjuvants – Clonidine and Neostigmine

- Newer Local Anaesthetics Ropivacaine and Levobupivacaine = less cardio toxicity
- Comparing Levobupivacaine / Bupivacaine / Ropivacaine with fentanyl for labour analgesia → 3 regimens are effective during 1st stage of labour.
- Pain score higher with Levobupivacaine group
- Motor block higher with Bupivacaine group

ADVANTAGES

- Alpha- 2 agonist – Clonidine Cholinesterase inhibitors – neostigmine
- Administered – epidural / Intrathecal route
- Spinal clonidine – 100 – 200 mcg

DISADVANTAGE

- More sedation
- Hypertension
- Fetal HR abnormality

Clonidine → not approved for use in obstetrics as profound hypotension was noticed.

ULTRASOUND IMAGING

1. Use of ultrasound is that to study the neuraxial anatomy, locating epidural space
2. Identification of epidural space & predict difficult spine scene in obese patients with abnormal lumbosacral anatomy.
3. Good level of success in inches – determined insertion point & very good agreement between ultrasound depth (UD) & needle depth (ND).
4. Thus epidural failure rate can be minimised in patients with difficult spines.
5. Vaginal birth after cesarean and epidural.
   » Early placement of the epidural catheter that can be used later for labour analgesia / anaesthesia in the event of operative delivery.
6. Epidural and breast feeding
   » No significance between epidural and lactation failure (or) less- successful breast feeding attempts
7. Backache and epidural
   » Incidence of long term back pain between woman who received epidural pain relief and woman who received other form of pain relief no significant difference

8. Maternal pyrexia and the New born

   » Epidural analgesia in non obstetrical patients is generally associated with a slight decrease in body temperature secondary to peripheral vasodilation and redistribution of heat from core to the periphery. The temperature rise is never above 1 degree centigrade with epidurals sometimes observed with women in long labour

9. Postdural puncture headache

   Small bore atraumatic spinal needle

   Decreased incidence and PDPH in patients receiving CSEA.

ADVANCES IN THE MANAGEMENT AND TREATMENT OF COMPLICATIONS

Local anesthetic toxicity treated by lipid solution which chelates bupivacaine and stabilises hemodynamics better compared with epinephrine.

Pressure generated during epidural injection - >11 psi breakpoint for permanent nerve damage in case of intraneural injection.

Insertion of epidural catheter - >5cm in epidural space leads to looping and kinking which can be see well through Computerised tomography .

Pharmacogenetics – Study of how genes affect the response to drugs significant increase in the sensitivity to intrathecal fentanyl in labouring women carrying a common variant of mu-opioid receptor gene.

CONCLUSION

The most important contribution of recent obstetric anaesthesia research to clinical practice has been the demonstration that early neuraxial labour analgesia does not negatively affect the mode of delivery and obviously improves maternal satisfaction.The choice of rather large doses of dilute solutions of Bupivacaine-opioid mixtures for initiation and maintenance of labour analgesia using PCEA.

The nextgeneration Pumps allows use of Automated delivery of mandatory boluses rather than background infusions and also utilizing CI PCEA programs.{computer integrated}

The use of ultrasound and continous intrathecal analgesia via microcatheters offer the potential to overcome difficulties in neuraxial analgesia placement in difficult cases .

EFFECTIVE STRATEGIES TO PREVENT PRETERM LABOUR IN TWIN GESTATION

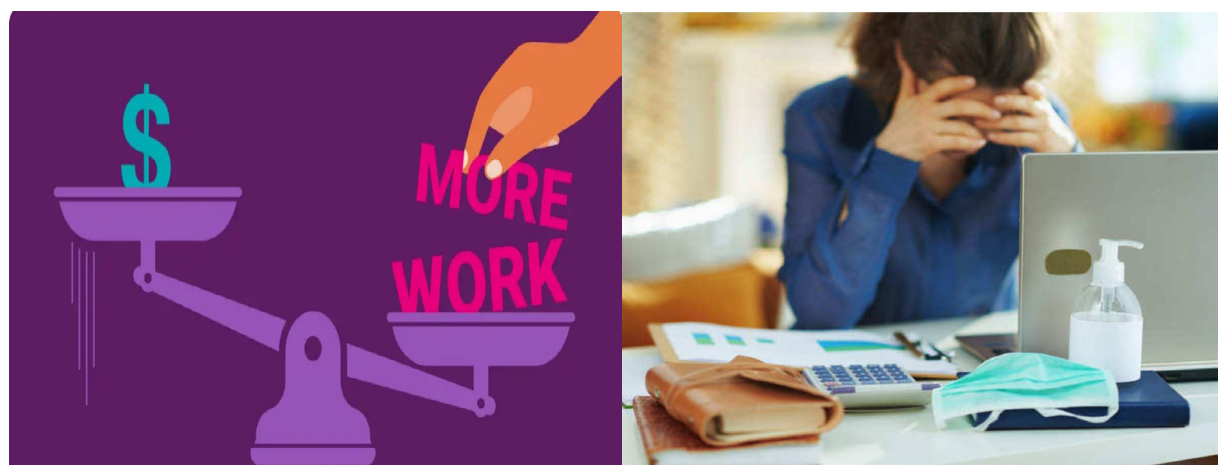
Dr. G. JAYAMALA,
DOWH (IRE), MRCOG (UK), MRCPI (OG)., DRM.,
CONSULTANT, RAINBOW HOSPITAL

- 3.2% of all live births
- 20% of all preterm deliveries
- 60% before 37 weeks
- 10.7% before 32 weeks
- 5 times high risk of early neonatal & Infant death due to prematurity
- Monochorionic Twins – Higher incidence of indicated & spontaneous preterm delivery than Dichorionic Twins

Some reported risk factors for preterm birth that are unique to twin pregnancy include

- Male-male twin pairs
- Spontaneous reduction of one fetus (Triplets reduced to twins)
- Previous spontaneous singleton preterm delivery

WHAT OBSTETRICIANS SEE



TWIN GESTATION

- Adverse maternal outcome – Increased risk of
  - Preeclampsia
  - PIH
  - Anemia
  - Gestational Diabetes
  - Thromboembolism
- Adverse neonatal outcome – Increased risk of
  - Congenital anomalies
  - IUGR
  - Cerebral palsy
  - Still birth
  - Perinatal mortality – 3 times higher than singleton
  - 12 fold higher preterm delivery rate

WHAT IS THE MEAN GESTATIONAL AGE AT BIRTH IN MULTIPLE GESTATIONS?

MEAN GESTATIONAL AGE AT BIRTH (WEEKS)

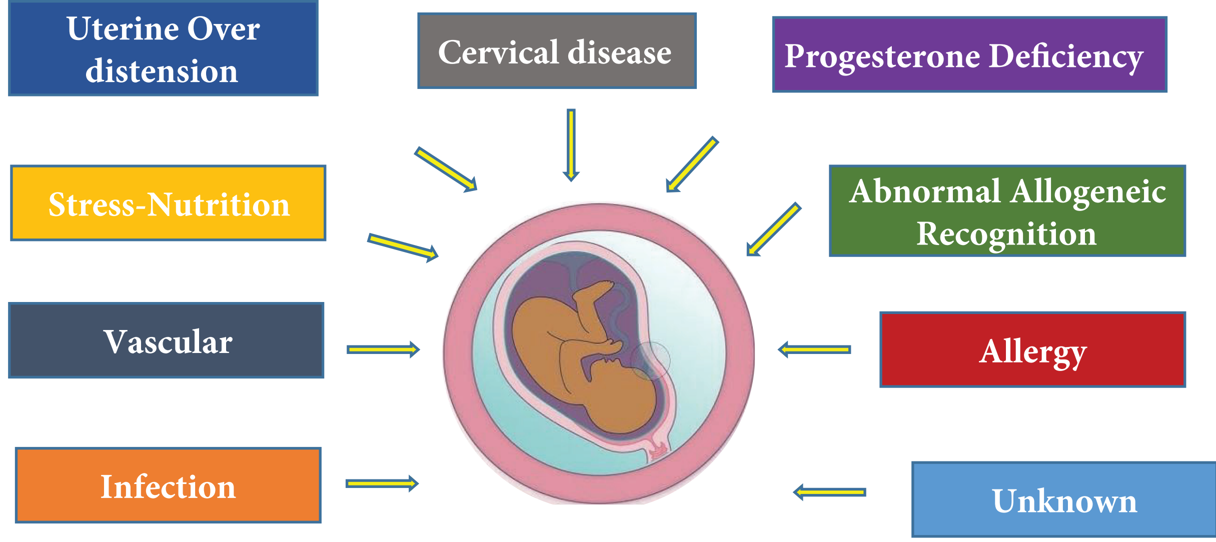
Singleton	40
Twins	35.2 ± 3.6
Triplets	32.2 ± 3.9
Quadruples	29.7 ± 4.5
Quintuplets	28.4 ± 2.7

PRETERM BIRTH IN TWIN PREGNANCIES ACCORDING TO ZYGOSITY

Gestational age at delivery	Monozygotic	Dizygotic	p
< 36 weeks	37.9% (36/95	20.4% (59/289)	0.001

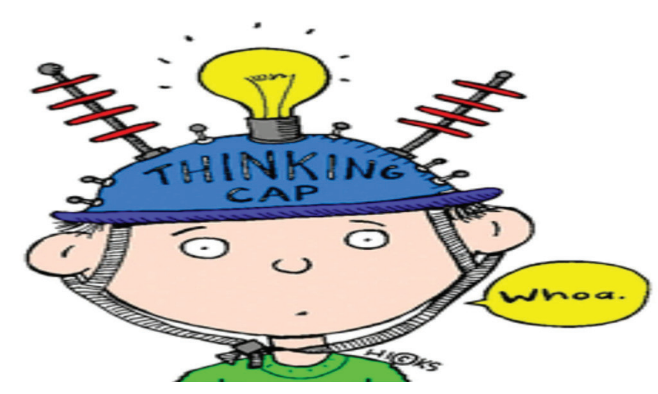
WHY DO TWIN PREGNANCIES HAVE A HIGHER RATE OF PRETERM LABOUR ?

THE PRETERM PARTURITION SYNDROME MULTIFACTORIAL ETIOLOGY

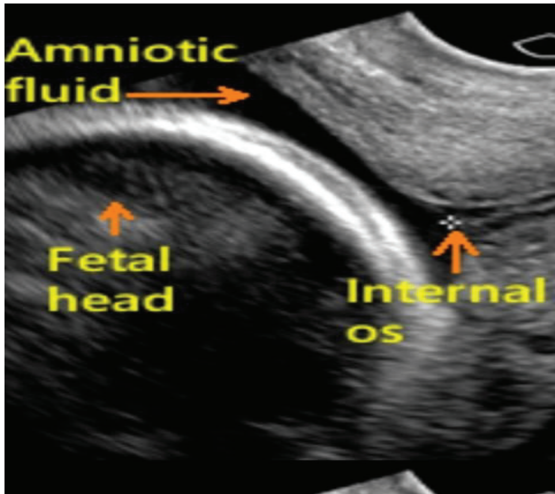


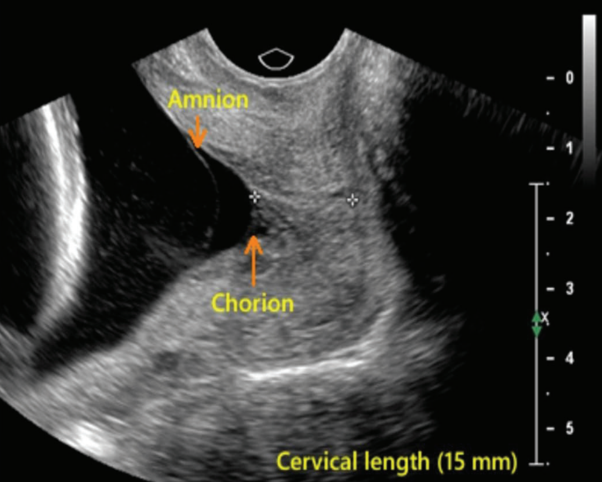
IATROGENIC PRETERM LABOUR – 1/3 (INDICATED)

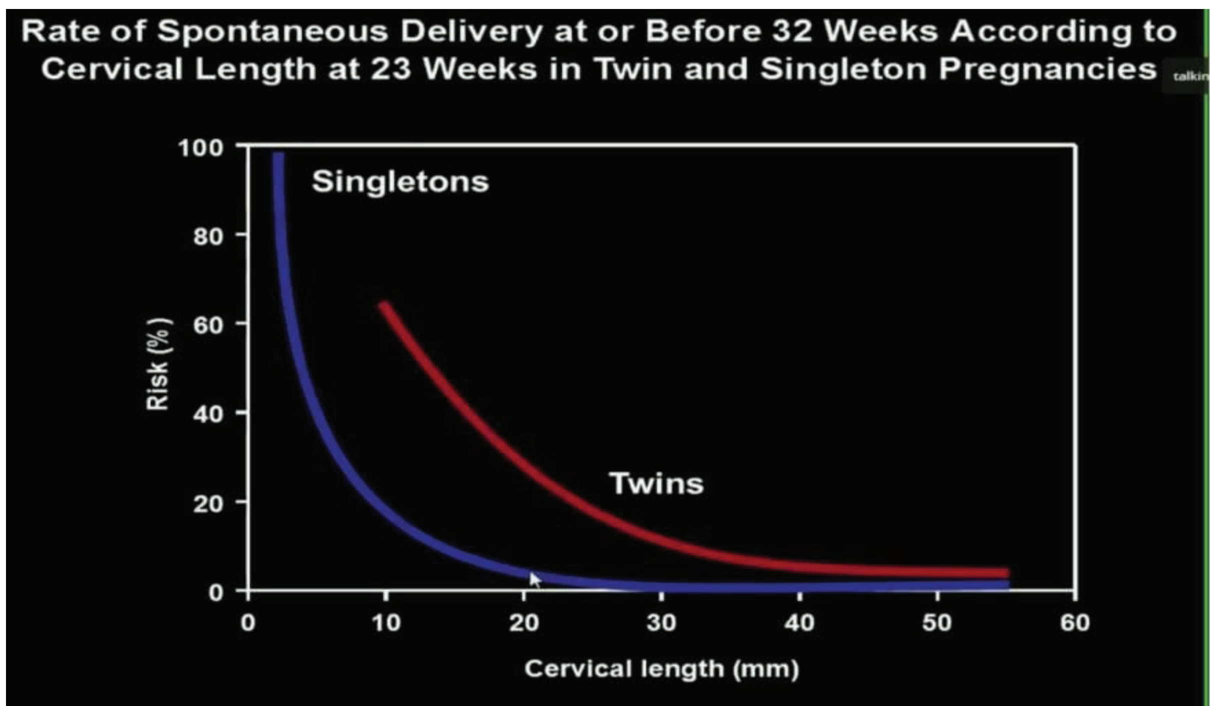
PREDICTION OF SPONTANEOUS PRETERM BIRTH IN TWINS



SHORT CERVIX







Transvaginal sonographic cervical length for the prediction of spontaneous preterm birth in twin pregnancies: a systematic review and metaanalysis

Agustín Conde-Agudelo [1], Roberto Romero, Sonia S Hassan, Lami Yeo

Affiliations + expand

PMID: 20576253
PMCID: PMC3147231
DOI: 10.1016/j.ajog.2010.02.064
Free PMC article

CONCLUSION

Transvaginal sonographic cervical length at 20-24 weeks gestation is a good predictor of spontaneous preterm birth in asymptomatic women with twin pregnancies

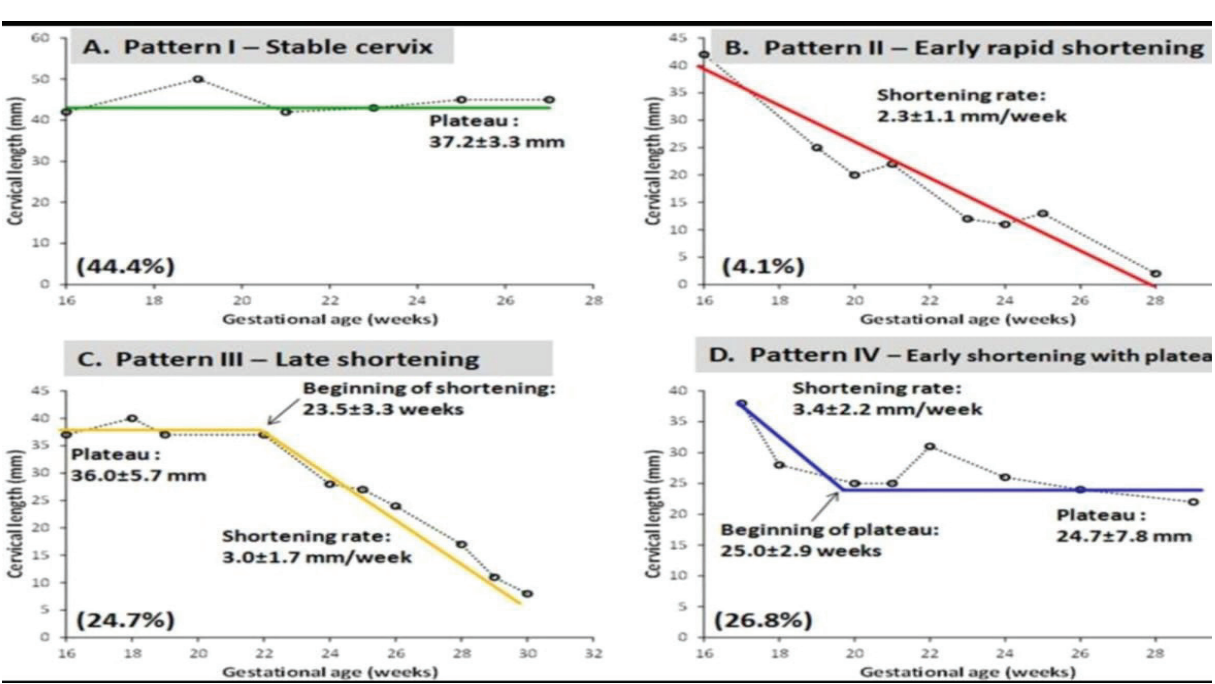
Serial cervical length determination in twin pregnancies reveals 4 distinct patterns with prognostic significance for preterm birth

Nir Melamed [1], Alex Pittini [2], Liran Hiersch [3], Yariv Yogev [3], Steven S Korzeniewski [4], Roberto Romero [5], Jon Barrett [2]

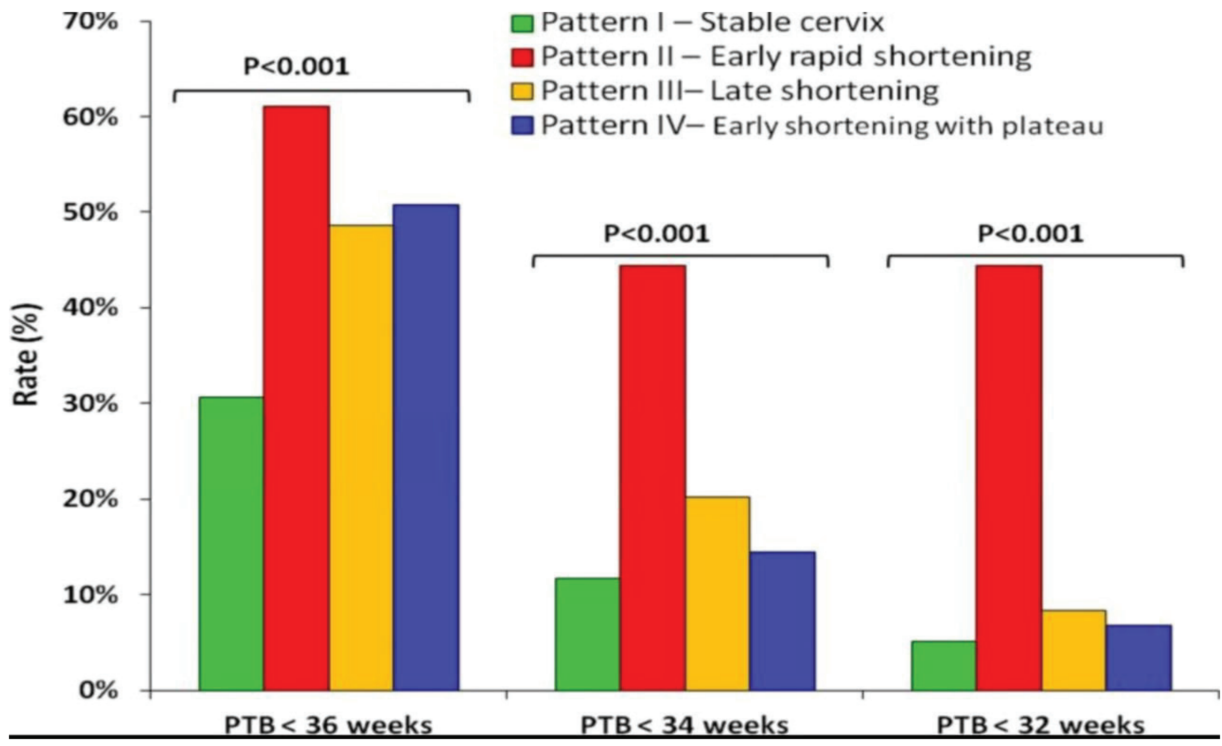
Affiliations + expand

PMID: 27207277
PMCID: PMC5045791
DOI: 10.1016/j.ajog.2016.05.018
Free PMC article

PATTERNS OF CHANGE IN SONOGRAPHIC CERVICAL LENGTH TWIN GESTATIONS



RATE OF PRETERM BIRTH ASSOCIATED WITH EACH OF FOUR PATTERNS OF CHANGE IN CERVICAL LENGTH



CONCLUSION

- Changes is sonographic cervical length over time in twin gestations can be classified into 4 patterns, each associated with a different risk of preterm birth
- Those with early and rapid shortening cervical length had the highest rate of preterm birth < 34 weeks of gestation
- Does not support repeated measurement of cervical length

CERVICOVAGINAL FETAL FIBRONECTIN

Review > J Matern Fetal Neonatal Med. 2010 Dec;23(12):1365-76.
doi: 10.3109/14767058.2010.499484.

Cervicovaginal fetal fibronectin for the prediction of spontaneous preterm birth in multiple pregnancies: a systematic review and meta-analysis

Agustín Conde-Agudelo [1], Roberto Romero

POOLED ESTIMATES FOR CERVICAL VAGINAL FETAL FIBRONECTIN IN PREDICTING SPONTANEOUS PRETERM BIRTH IN TWINS

Outcome	No.of studies	No.of women	Pooled Sensitivity % (95% Cl)	Pooled specificity %(95% CI)	Positive Likelihood Ratio (95% CI)	Negative Likelihood Ratio (95%Ci)
Preterm birth						
< 32 weeks2		302	33 (14-60)	94 (85-97)	5.1 (2.7-10.0	0.71 (0.41-1.27)
< 34 weeks6		676	39 (29-51)	80 (74-86)	2.0 (1.2-2.8)0	.76 (0.52-1.06)
< 37 weeks5		5203	3 (25-45)	87 (80-94)	2.6 (1.4-7.1)	0.76 (0.47-0.93)

CONCLUSION

- Cervicovaginal fetal fibronectin provides moderate to minimal prediction of preterm birth in women with multiple pregnancies.
- In asymptomatic patients the predictive value is low
- The test is most accurate in predicting spontaneous preterm birth within 7 days of testing in women with twin pregnancies and threatened preterm labour.
- NICE guideline does not recommend fetal fibronectin testing in asymptomatic women with twins
- Combination of cervical length and fetal fibronectin may be more accurate predictor of preterm labour
- If fetal fibronectin is positive and cervical length is < 20mm – 54.4% would delivered before 34 weeks which is significantly higher than over all preterm birth

PREVENTION OF PRETERM BIRTH

BED REST

- No evidence
- Increased risk of venous thromboembolism

VAGINAL PROGESTERONE

Early vaginal progesterone versus placebo in twin pregnancies for the prevention of spontaneous preterm birth: a randomized, double-blind trial

Anoop Rehal, MD • Zsófia Benkő, MD • Catalina De Paco Matallana, MD • ...
Alan Wright, PhD • David Wright, PhD • Kypros H. Nicolaides, MD •
Show all authors

Published: June 26, 2020 • DOI: https://doi.org/10.1016/j.ajog.2020.06.050 •

CONCLUSION

- Universal treatment with vaginal progesterone did not reduce the incidence of spontaneous birth between 24+0 and 33+6 weeks gestation.
- Progesterone may reduce the risk of spontaneous birth before 32 weeks gestation in women with a cervical length of < 30mm, and it may increase the risk for those with a cervical length ≥ 30mm.

SYSTEMATIC REVIEW | ARTICLES IN PRESS

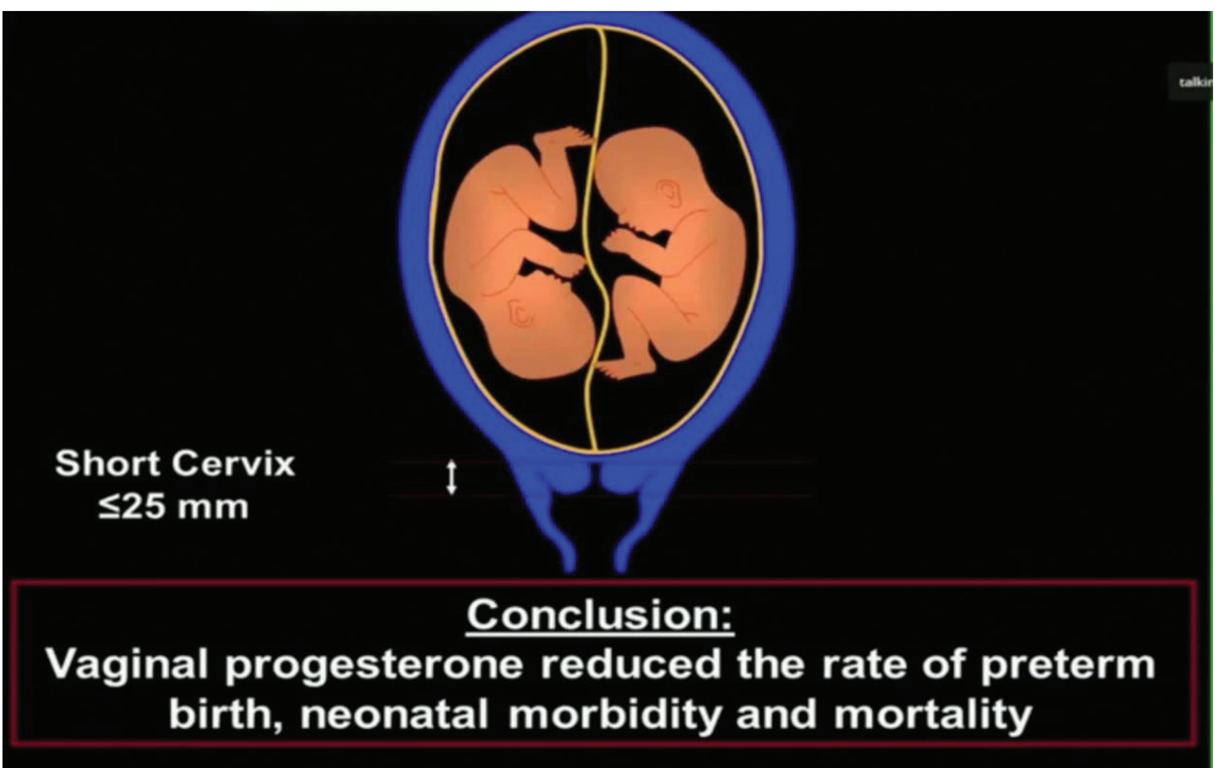
Vaginal progesterone for preventing preterm birth and adverse perinatal outcomes in twin gestations: a systematic review and meta-analysis

Agustin Conde-Agudelo, MD, MPH, PhD •
Roberto Romero, MD, DMedSci • Anoop Rehal, MD • ...
Alfredo Perales, MD, PhD • Sonia S. Hassan, MD • Kypros H. Nicolaides, MD •
Show all authors

Published: May 14, 2023 • DOI: https://doi.org/10.1016/j.ajog.2023.05.010

CONCLUSION

- Vaginal progesterone does not prevent preterm birth, not does it improve perinatal outcomes in unselected twin gestations
- But it appears to reduce the risk of preterm birth occurring at early gestational ages and of neonatal morbidity and mortality in twin gestations with a sonographic short cervix.

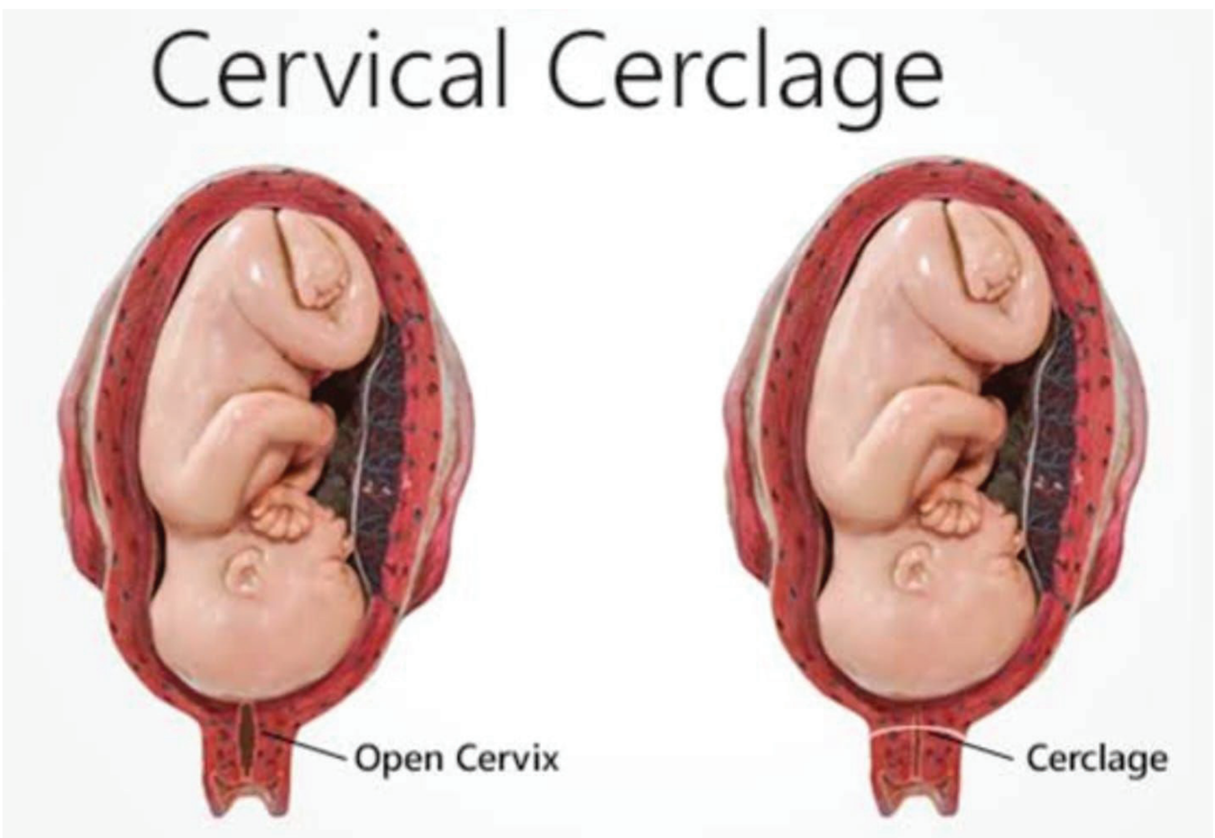


INJECTABLE PROGESTERONE

PERTINENT POINTS

- Twice weekly prophylactic injections of 17 alpha-hydroxyprogesterone caproate (17P) did not prolong the pregnancy of women with asymptomatic twin pregnancy and short cervix.
- The rate of preterm delivery before 32 weeks gestation significantly increased in women treated with 17P compared with women in the control group.

CERVICAL ENCERCLAGE



Meta-Analysis > Am J Obstet Gynecol. 2019 Jun;220(6):543-557.e1.
doi: 10.1016/j.ajog.2018.11.1105. Epub 2018 Dec 7.

Cerclage for women with twin pregnancies: a systematic review and metaanalysis

Chunbo Li [1], Jie Shen [1], Keqin Hua [2]

Affiliations + expand

PMID: 30527942
DOI: 10.1016/j.ajog.2018.11.1105

CONCLUSION

- Our **meta-analysis** indicates that cerclage placement is **beneficial** for the reduction of preterm birth and the prolongation of pregnancy in twin pregnancies with a **cervical length of < 15mm or dilated cervix of > 10mm.**
- However, the benefit of history-indicated or twin alone-indicated cerclage is less certain in twin pregnancies with normal cervical length according to current literature.

> Am J Obstet Gynecol MFM. 2023 Mar;5(3):100847. doi: 10.1016/j.ajogmf.2022.100847. Epub 2023 Jan 11.

Efficacy of ultrasound-indicated cerclage in twin pregnancies: a retrospective case-control study matched by cervical length

Liping Qiu [1], Min Lv [2], Cheng Chen [2], Juan Li [2], Baihui Zhao [3], Qiong Luo [4]

CONCLUSION

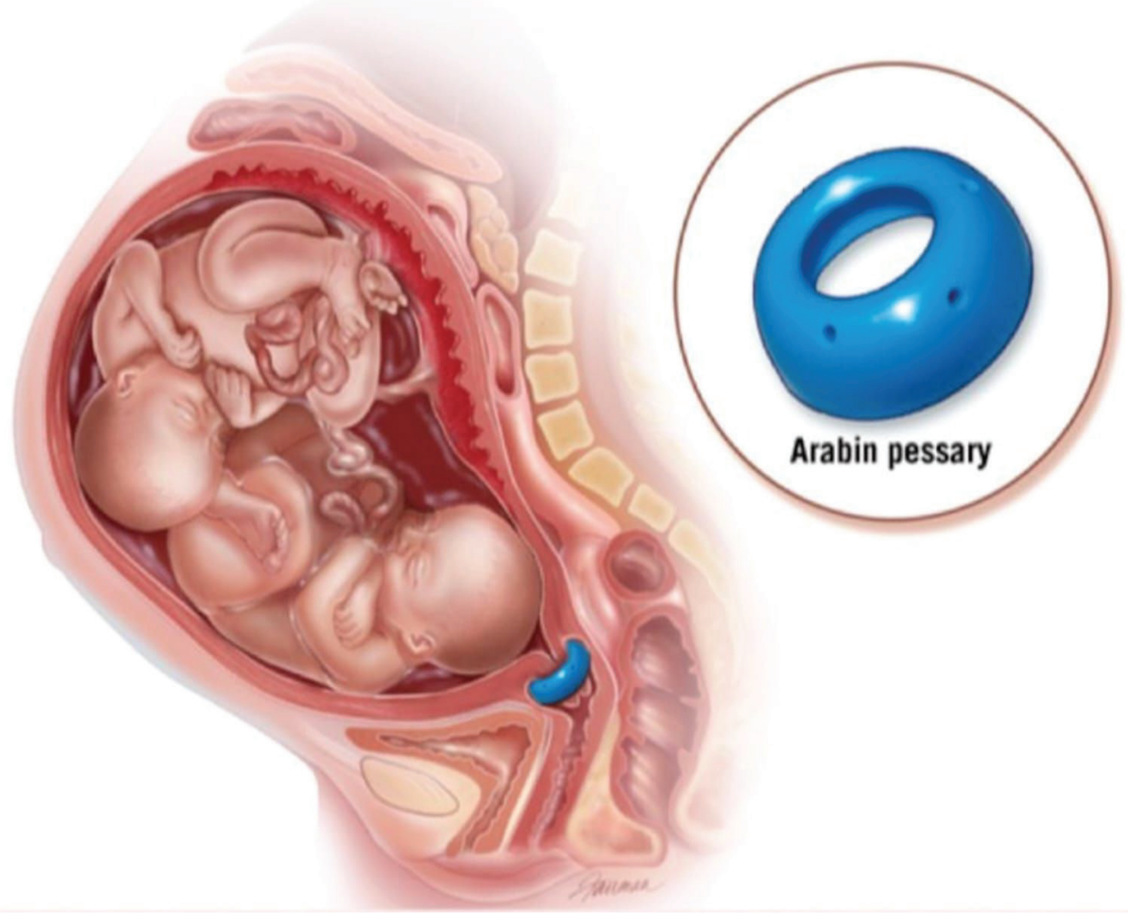
- Cerclage among women with twin pregnancies with a transvaginal cervical length <25mm may reduce the rate of spontaneous preterm birth and improve perinatal and neonatal outcomes when compared with expectant management.
- It is worth noting that even with a short transvaginal cervical length of 15-24mm, cerclage will significantly decrease the risk of delivery at < 36 weeks gestation and prolong pregnancy latency.
- Among women with a short transvaginal cervical length < 15mm, cerclage will significantly decrease the risk of delivery at <32 and <34 weeks gestation and prolong pregnancy latency.
- Ncerclage for asymptomatic twins
- Subgroup of twins in 2005 meta-analysis showed increase in preterm labour and a trend towards harm

Box 1. Preterm birth prevention in multiple pregnancy from the National Institute for Health and Care Excellence guideline 2011[1]

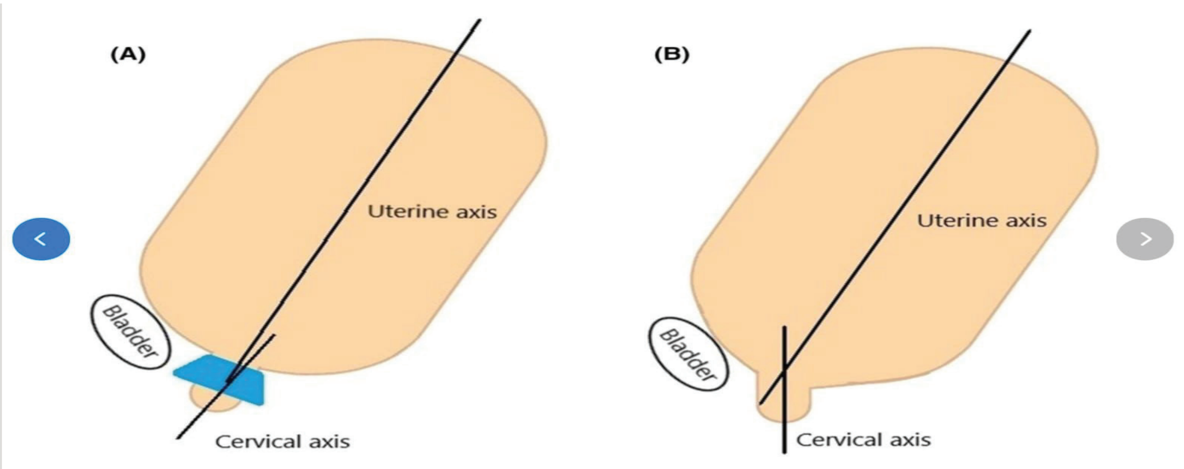
Do not use the following interventions (alone or in combination) routinely to prevent spontaneous preterm birth in twin or triplet pregnancies:

- Bed rest at home or in hospital
- Intramuscular or vaginal progesterone
- Cervical cerclage
- Oral tocolytics

CERVICAL PESSARY (ARABIN)



- Flexible silicon ring
- Encompasses the cervix
- Aims to tilt it posteriorly and provide cervical support



Uterocervical alignment before and after cervical pessary placement. Schematic drawings of a mid-sagittal view of the uterus and cervix that illustrate changes in uterocervical angles and cervical alignment to uterine axis from before (A) to after (B) pessary placement [Color figure can be viewed at wileyonlinelibrary.com]

USAGE IN UNSELECTED TWIN PREGNANCY

- No difference in the rate of preterm birth before 34 weeks

USAGE IN TWINS SHORT CERVIX

- PECEP – Twin trial
- RCT – Short cervix with pessary the rate of PTB before 34 weeks was reduced in pessary group than expectant group
- Evidence for use of cervical pessary for prevention of PTB in twins is conflicting though there is some evidence to suggest it may be useful in twin pregnancy with short cervix
- STOPPIT 2 RCT is currently recruiting for twins with short cervix

TOCOLYTICS

- No role for prophylactic tocolytics
- Tocolytics for acute preterm labour for the benefit of anternal steroids
- Indomethacin – 50-100mg loading dose followed by
- 25-50mg every 6 hours for 48 hours
- Nifedipine
- Atosiban
- Magnesium Sulphate

VAGINAL LACTOFERRIN

Vaginal lactoferrin in prevention of preterm birth in women with bacterial vaginosis

Marilena Miranda [1], Gabriele Saccone [1], Alessandra Ammendola [1], Emilia Salzano [1], Marisa Iannicelli [1], Rossella De Rosa [1], Giovanni Nazzaro [1], Mariavittoria Locci [1]

Affiliations + expand

PMID: 31722591

DOI: 10.1080/14767058.2019.1690445

Conclusion: Based on this small single-center retrospective study, supplementation with vaginal lactoferrin in women with first trimester bacterial vaginosis may be an option to reduce the risk of preterm delivery.

MY EXPERIENCE

November 2022 - October 2023

No. Of pessary inserted- 19

- Singleton-10
- Twins-9

Singleton

Prophylactic - 9 (history indicated)

Emergency 1

TWINS

Prophylactic - 5

Emergency - 4

Cerclage with pessary - 3

Only pessary - 1

1. Emergency 25+ weeks DCDA TWINS . IVF pregnancy

Cervix 2cms dilated with prolapsed membranes

Rescue encerclage with pessary

LSCS at 32 weeks as one baby IUGR and CTG abnormality

2. OI conception - DCDA twins

Referred at 28wks with residual cervical length 1.5cms.

OS open Cerclage an pessary. Delivered at 34 weeks for pre eclampsia

3. IVF pregnancy. DCDA twins

Cerclage and pessary at 28 weeks

33 and 6 weeks . Pre eclampsia

4. IVF pregnancy. DCDA twins .open os

Only pessary

34 weeks for PPROM.

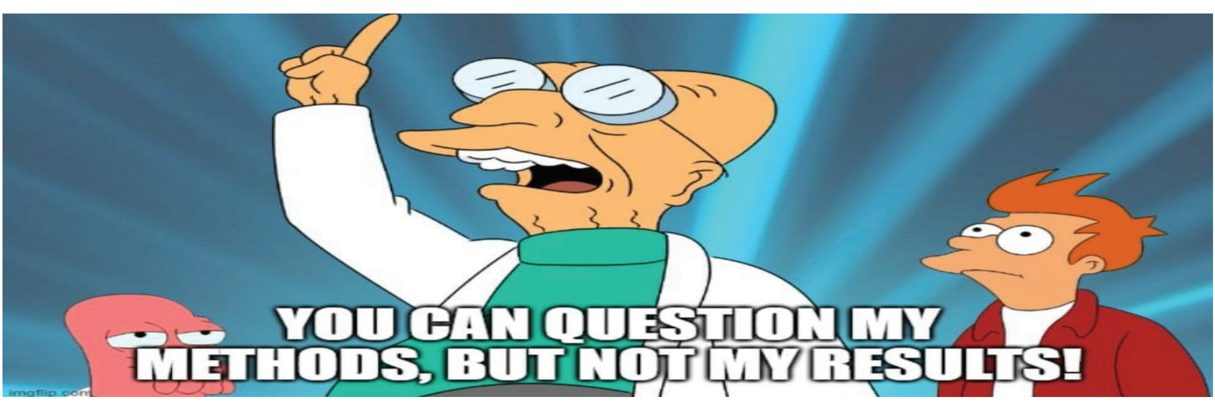
Prophylactic (5) - 14 weeks

35+ weeks - elective at maternal request

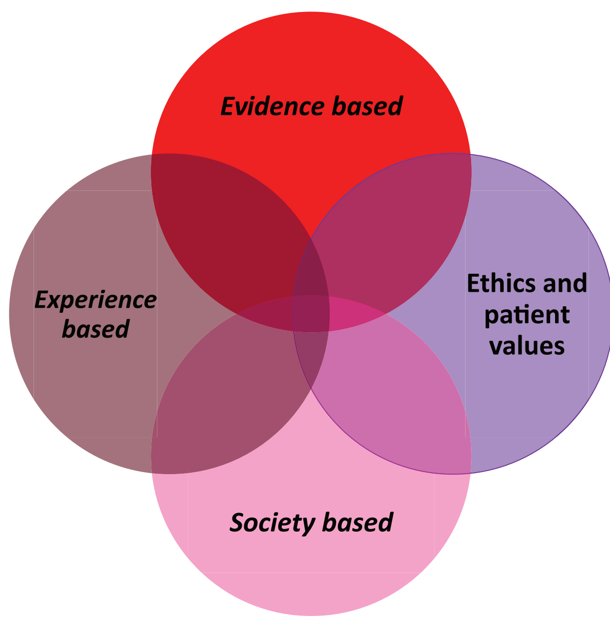
35 weeks in labour

36+ weeks - Elective

2 ongoing



WHAT REALLY WORKS !!!???



SUMMARY

With normal cervical length in twin gestation

Prophylactic vaginal progesterone
Prophylactic cerclage
Prophylactic pessary
Prophylactic tocolytics

} No evidence to prevent preterm labour

CONCLUSION

There is lack of effective, evidence based intervention for prevention of PTB in twin pregnancy.

SOCIAL EGG FREEZING - THE DAWN OF A NEW ICE AGE

Dr. KAVITHA NAGARAJAN,
MD (OG), MRCOG (UK), FRM, MICG
CLINICAL DIRECTOR & IVF CONSULTANT
SKS WOMENS CENTRE

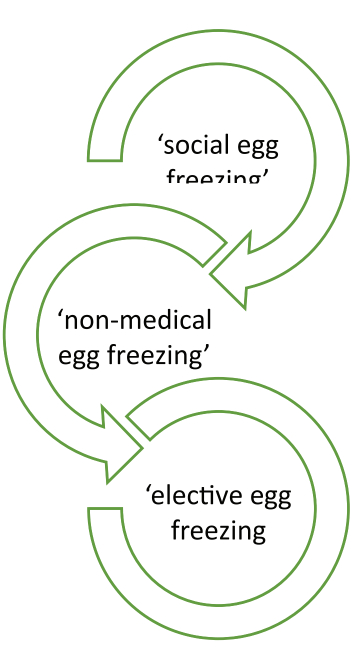
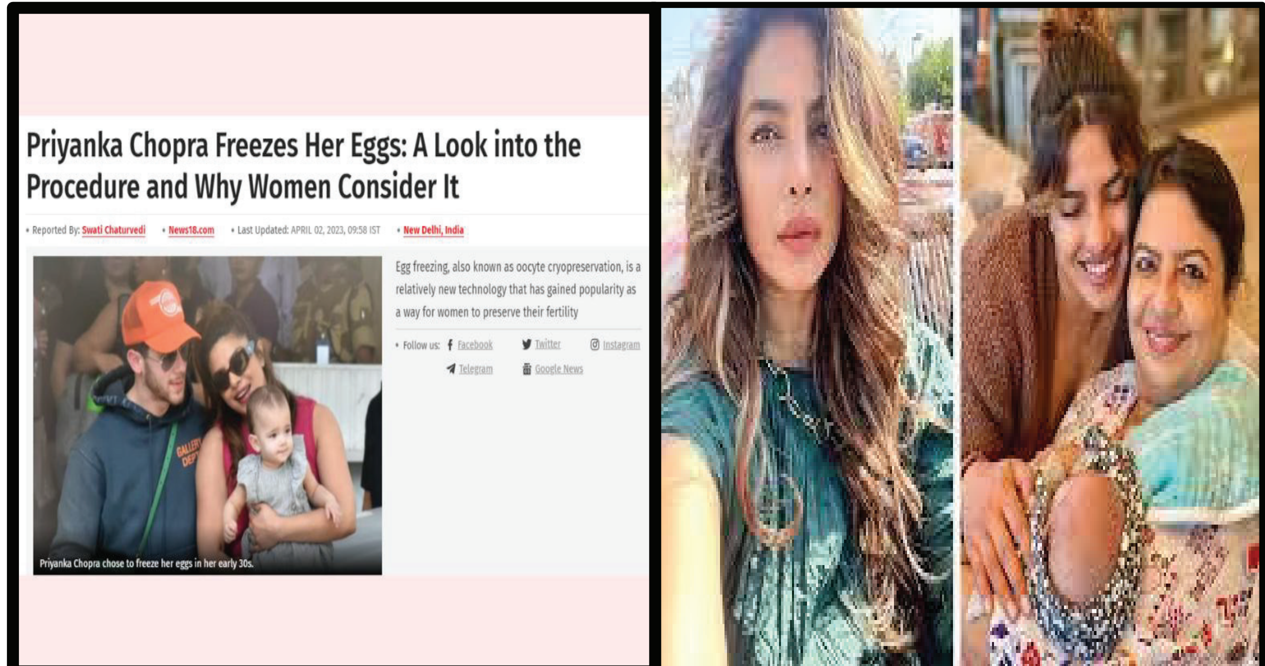


Table 1. Indications for Fertility Preservation.

Indications
Malignant diseases requiring gonadotoxic chemotherapy, radiotherapy, or bone marrow transplantation
Hematologic diseases (leukemia, Hodgkin's lymphoma, non-Hodgkin's lymphoma)
Breast cancer
Sarcoma
Some pelvic cancers
Nonmalignant conditions
Systemic diseases requiring chemotherapy, radiotherapy, or bone marrow transplantation
Ovarian diseases
Bilateral benign ovarian tumors
Severe and recurrent ovarian endometriosis
Possible ovarian torsion
Risk of premature ovarian insufficiency
Family history
Turner's syndrome
Personal reasons
Age
Childbearing postponed until later in life



Priyanka Chopra Freezes Her Eggs: A Look into the Procedure and Why Women Consider It

• Reported By: Swati Chaturvedi • News18.com • Last Updated: APRIL 02, 2023, 09:58 IST • New Delhi, India

Egg freezing, also known as oocyte cryopreservation, is a relatively new technology that has gained popularity as a way for women to preserve their fertility

• Follow us: Facebook Twitter Instagram Telegram Google News

Priyanka Chopra chose to freeze her eggs in her early 30s.

2014......

Aim to give employees more freedom to pursue family planning according to their own timeline

FAQs ANSWERED

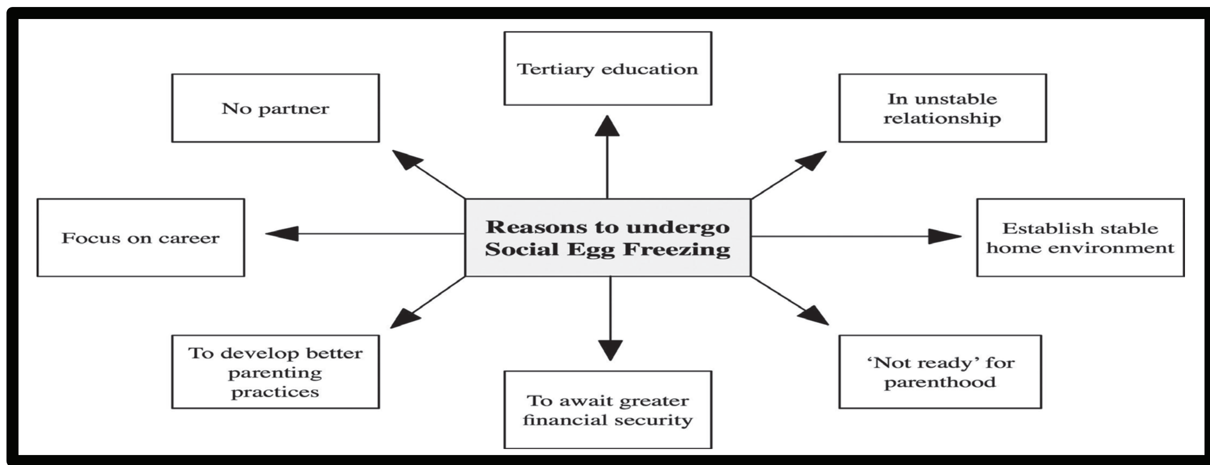
- What is Social egg freezing?
- FOR WHOM?
- WHY WOMEN SHOULD THINK ABOUT EGG FREEZING?
- WHAT IS THE RIGHT AGE FOR EGG FREEZING?
- What are the potential benefits of social egg freezing and in vitro fertilization?
- What are the societal implications of social egg freezing?
- What are the medical risks of social egg freezing and IVF?
- What are the medical risks of pregnancy at an advanced age?
- How are human oocytes retrieved and frozen?
- HOW MANY EGGS NEEDED TO ACHIEVE A PREGNANCY
- what are the financial costs of social egg freezing?
- WHAT IS THE PROCEDURE INVOLVED WHEN THEY PLAN TO GET PREGNANT?
- HOW LONG CAN WE CRYOPRESERVE ?
- HOW ABOUT THE SUCCESS RATE?

WHAT IS SOCIAL EGG FREEZING?

Cryopreservation of mature oocytes on an elective basis for the purpose of delayed childbearing	Empowers women with the opportunity to defer their childbearing years	Potentially reducing, but not eliminating, the risk of unintentional permanent childlessness

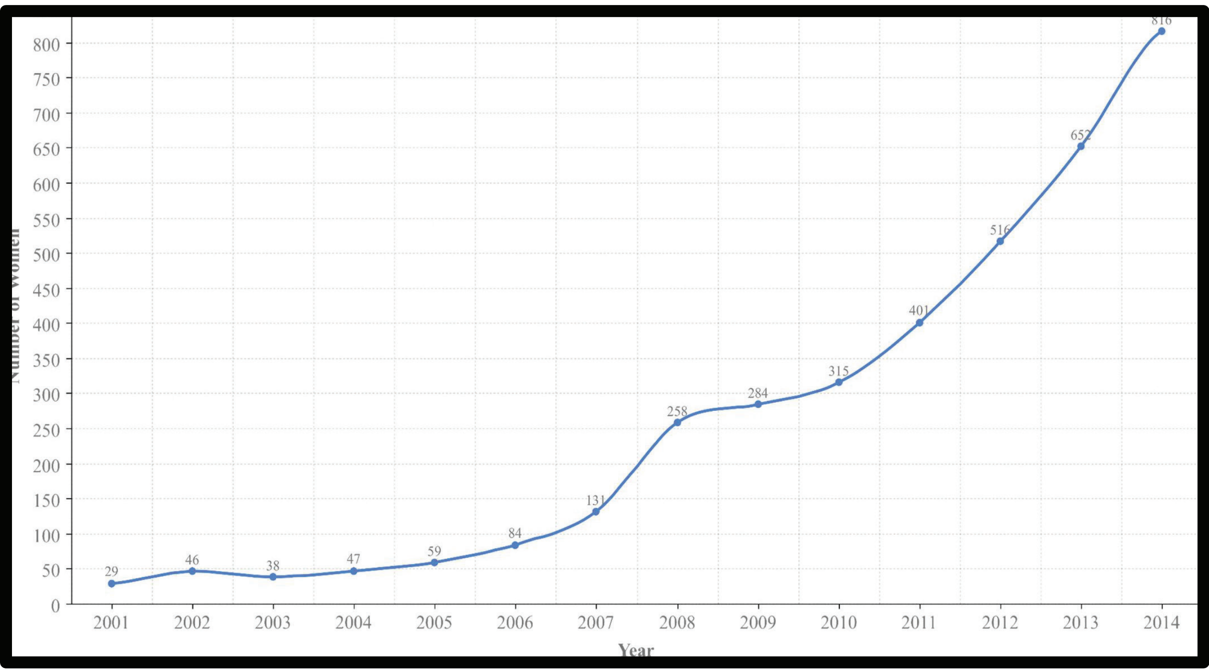
The dawn of a new ice age: social egg freezing

FOR WHOM ? - Some women delay time of childbearing in order to fulfil other personal goals



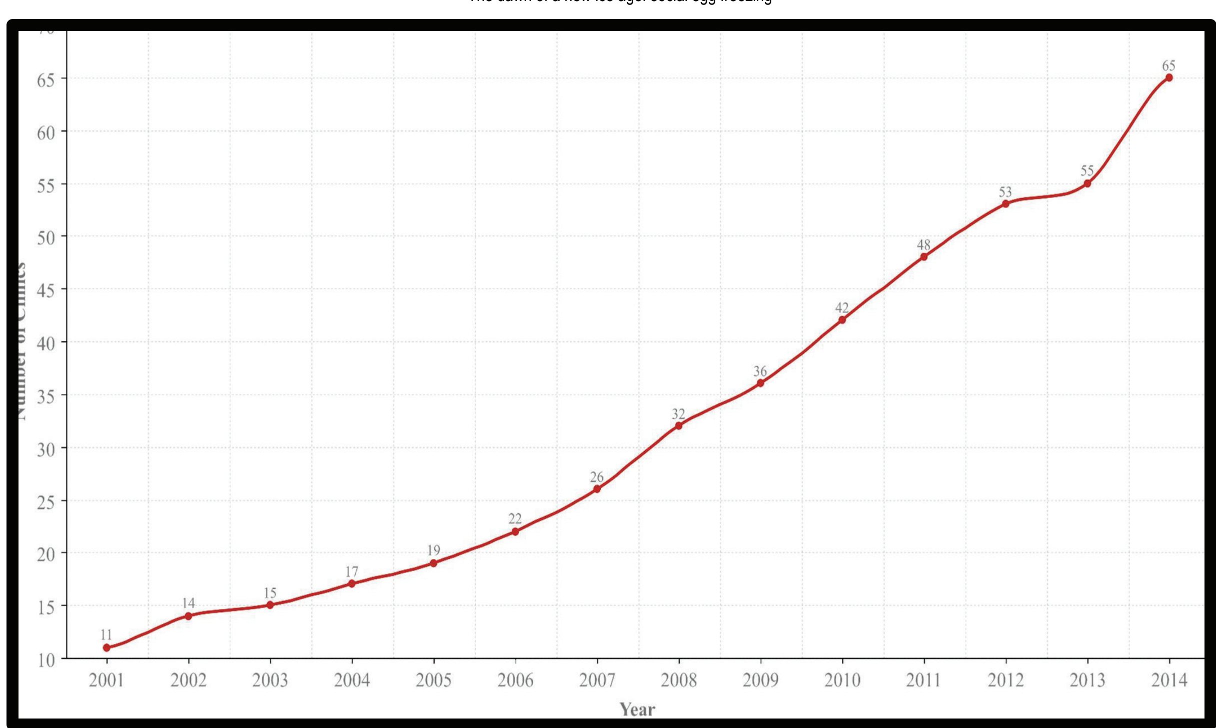
Acta Obstet Gynecol Scand, Volume: 97, Issue: 6, Pages: 641-647, First published: 26 February 2018, DOI: (10.1111/aogs.13335)

The dawn of a new ice age: social egg freezing



Acta Obstet Gynecol Scand, Volume: 97, Issue: 6, Pages: 641-647, First published: 26 February 2018, DOI: (10.1111/aogs.13335)

The dawn of a new ice age: social egg freezing

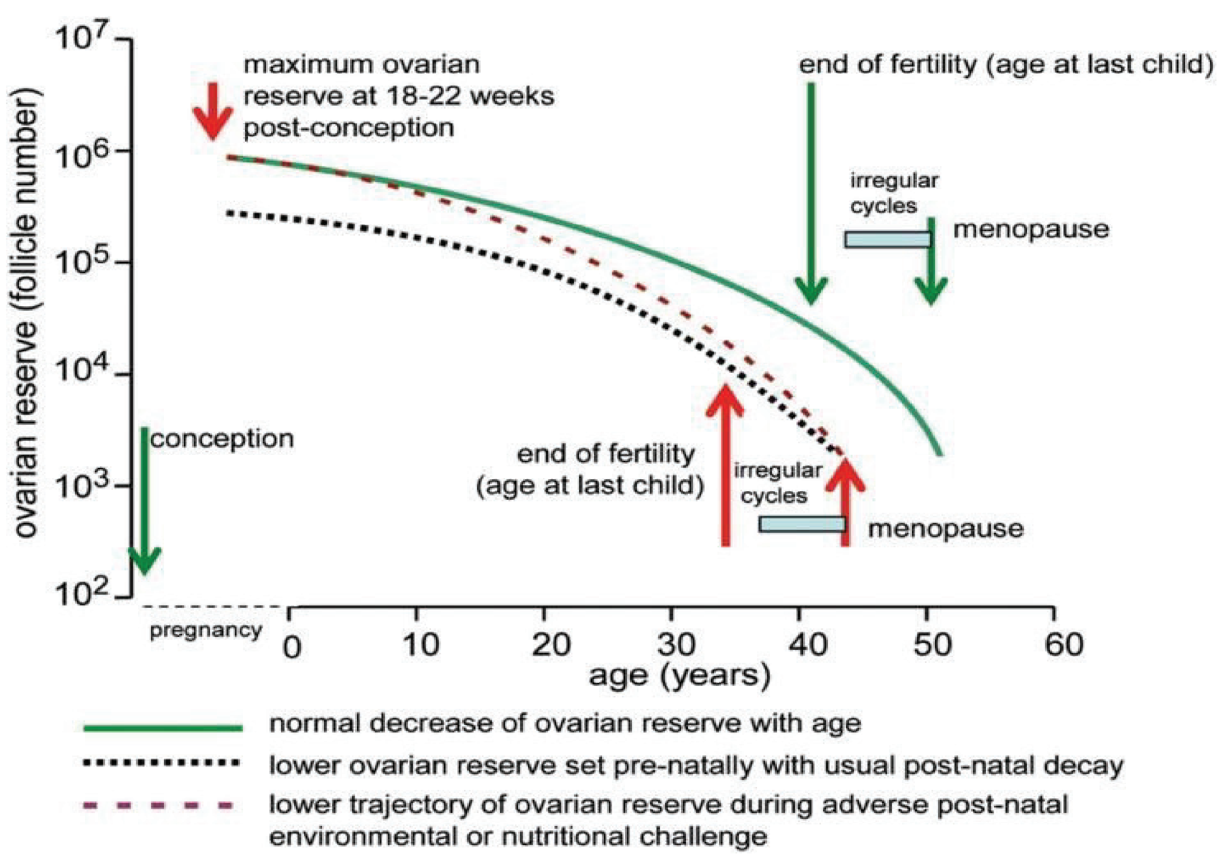


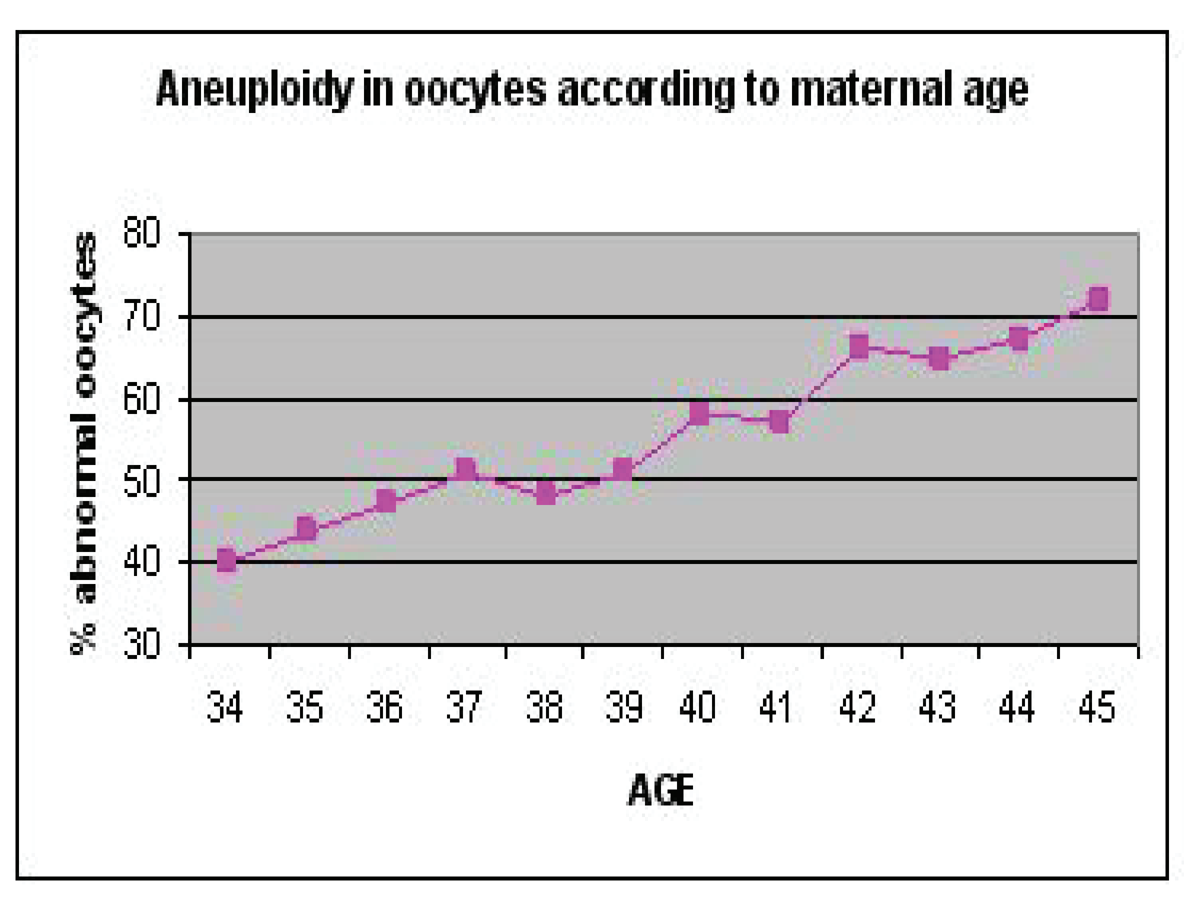
Acta Obstet Gynecol Scand, Volume: 97, Issue: 6, Pages: 641-647, First published: 26 February 2018, DOI: (10.1111/aogs.13335)

WHY WOMEN SHOULD THINK ABOUT SOCIAL EGG FREEZING?

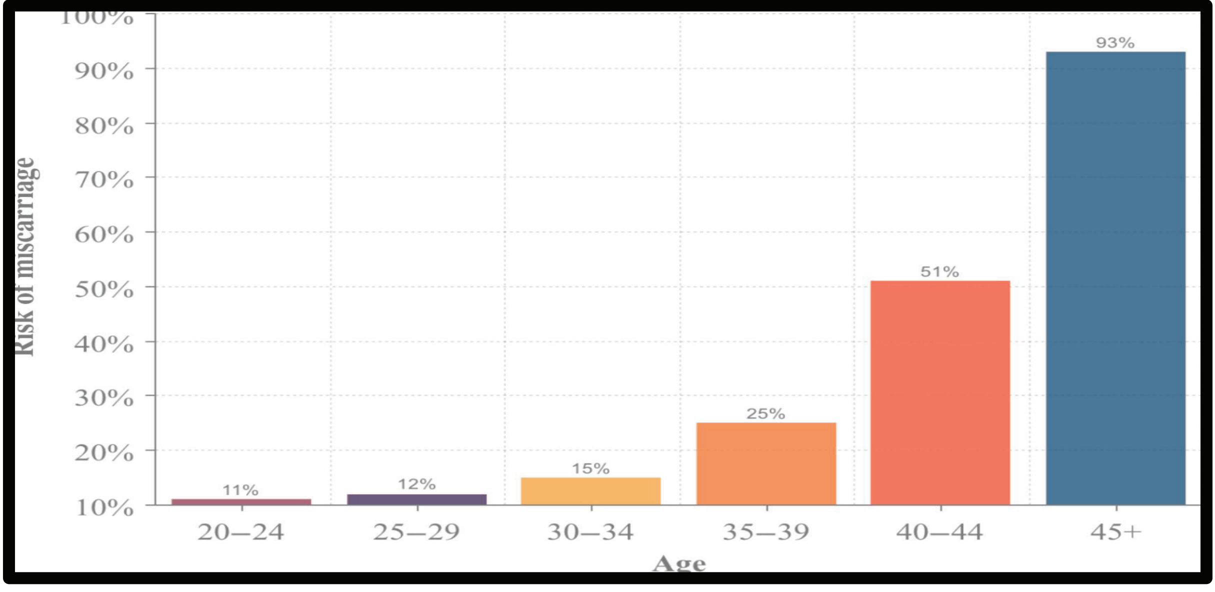
- Best way to provide females with reproductive potential more like that of males.
- Process of spermatogenesis takes approximately 70 days and continues throughout a man's life, allowing most men to maintain fertility in perpetuity

WHY WOMEN SHOULD THINK ABOUT SOCIAL EGG FREEZING?





The dawn of a new ice age: social egg freezing



IVF - cannot overcome the irreversible decline in oocyte quality and quantity

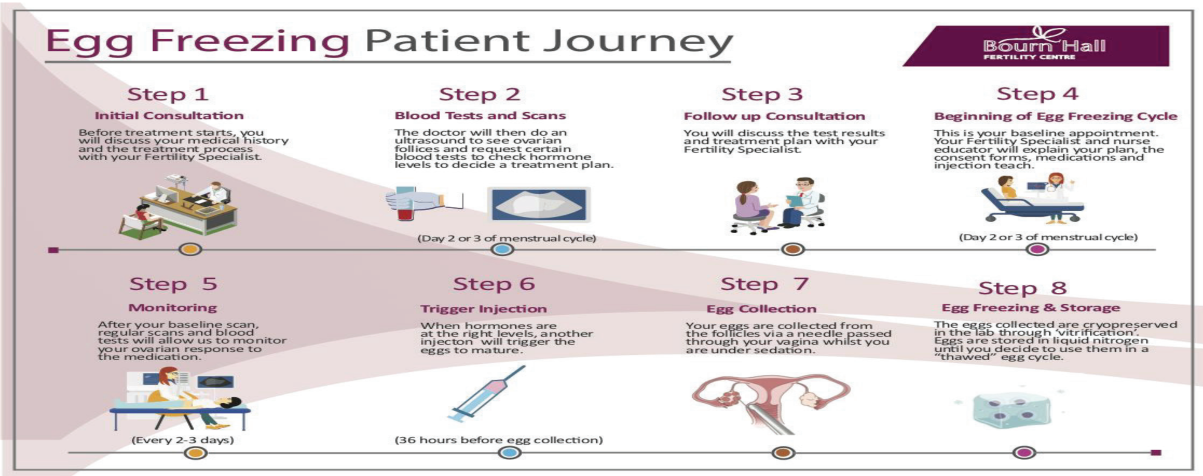
Acta Obstet Gynecol Scand, Volume: 97, Issue: 6, Pages: 641-647, First published: 26 February 2018, DOI: (10.1111/aogs.13335)

WHAT IS THE RIGHT AGE FOR EGG FREEZING?

Highest chance of successful live birth following SEF is when it is performed before the age of 34 years

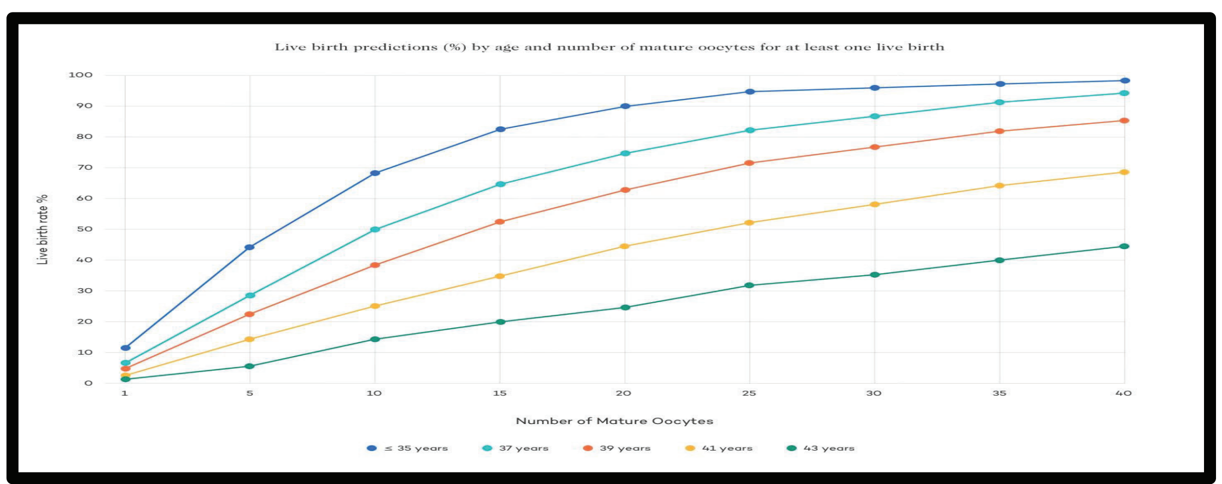
- Asian women age faster than their western counterparts.
- Asian women age faster than their western counterparts.
- Asian women age faster than their western counterparts.

WHAT DOES EGG FREEZING INVOLVE?



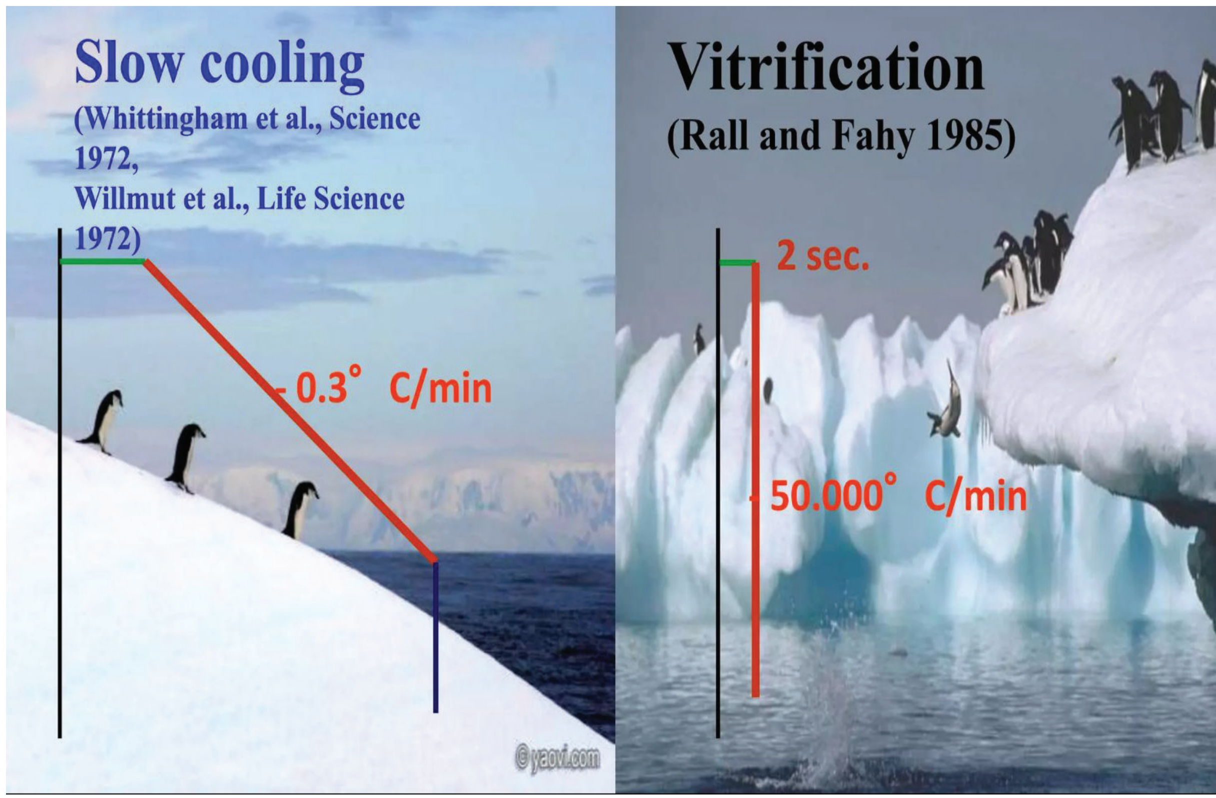
HOW MANY EGGS WE NEED TO ACHIEVE A PREGNANCY?

DEPENDS ON WOMEN AGE

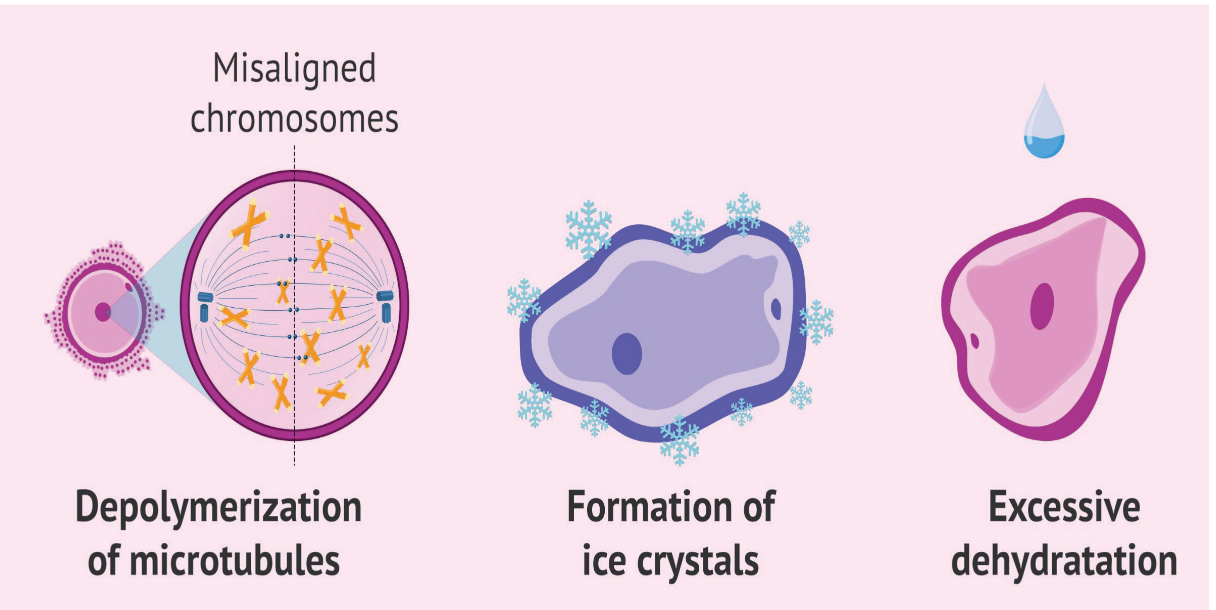


HOW SAFE IS THE PROCESS OF EGG FREEZING?

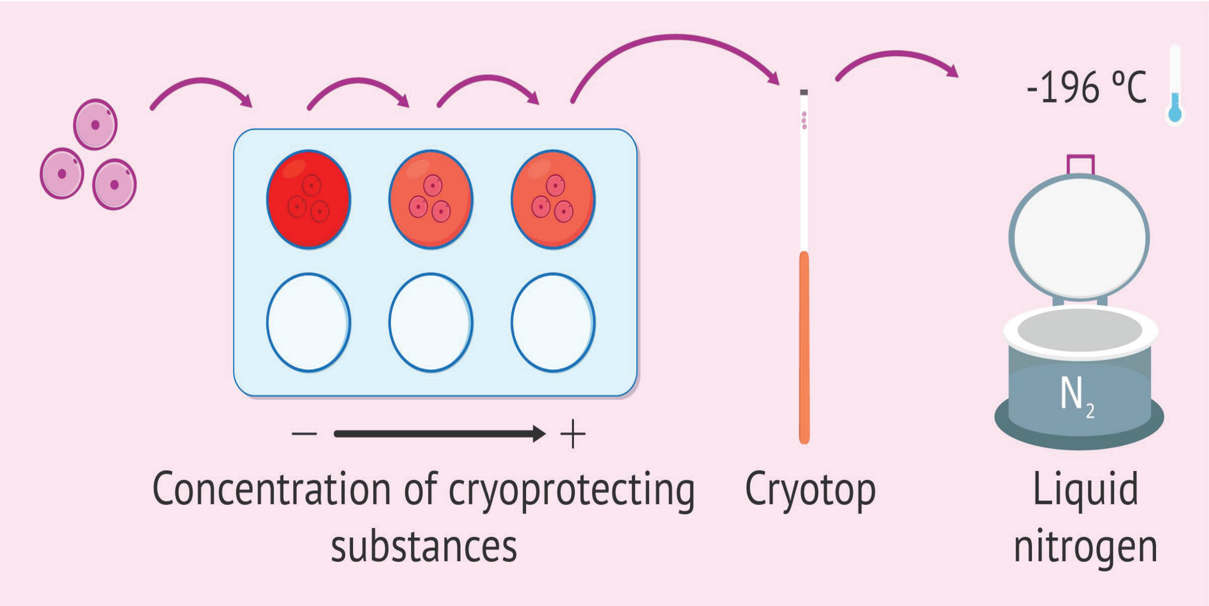
- First birth from a cryopreserved human oocyte was reported in the Lancet in 1986
- argest cell in the human body, eggs are very difficult to freeze - spherical shape, high water content, and low surface area to volume ratio make eggs especially difficult to permeate with cryoprotectants and prone to intracellular ice crystal formation



SLOW FREEZING



VITRIFICATION



WHAT ARE THE POTENTIAL BENEFITS OF SOCIAL EGG FREEZING AND IN VITRO FERTILIZATION?

- 2 important benefits to women who anticipate becoming pregnant at an advanced age:
- Possibility of becoming a genetic parent using their frozen–thawed eggs
- Reduces the risk of having children with chromosomal abnormalities associated with aneuploidy

WHAT ARE THE MEDICAL RISKS OF SOCIAL EGG FREEZING AND IVF?

- Ovarian hyperstimulation syndrome
- PROCEDURE RELATED RISKS
- Multiple pregnancy,
- Pregnancy-related high blood pressure,
- Premature delivery,
- Operative delivery and infants with low birth weight

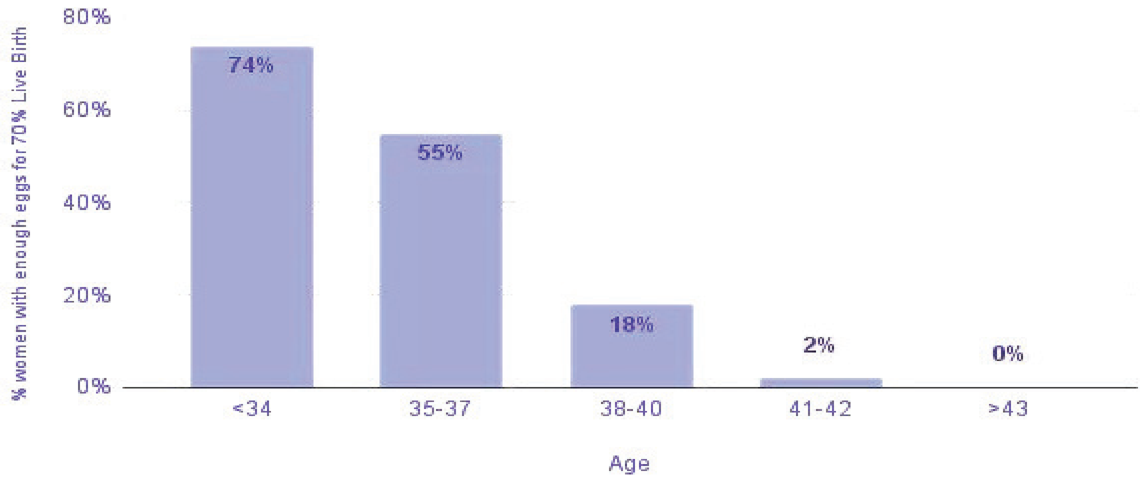
WHAT ARE THE MEDICAL RISKS OF PREGNANCY AT AN ADVANCED AGE?

- Gestational diabetes
- Preeclampsia
- Cesarean delivery
- Preterm delivery / baby with low birth weight

WHAT IS THE PROCEDURE INVOLVED WHEN THEY PLAN TO GET PREGNANT?

- THAWING OF FROZEN OOCYTES
- IVF / ICSI
- EMBRYO TRANSFER

HOW ABOUT THE SUCCESS RATE?



EVIDENCE.....

- Cobo and colleagues 2016 - 1468 women - 9.3% had returned to use their eggs - average age of those returning was 37.7 years - overall egg survival rate was 85.2%
- 35 or younger at the time of egg freezing ,who banked 10 eggs, the LBR - 60.5%
- 36 or older, the same 10 eggs yielded a significantly lower live birth rate of 29.7%

HOW LONG CAN WE CRYOPRESERVE IT?

- 10 YEARS

WHAT ARE THE FINANCIAL COSTS OF SOCIAL EGG FREEZING?

- In India, it costs approximately between 125000 and 150000 INR

IS THIS ALLOWED IN INDIA?

- YES LEGALLY ALLOWED

WHAT ARE THE SOCIETAL IMPLICATIONS OF SOCIAL EGG FREEZING?

- Media coverage often emphasizes the potential benefits of egg freezing and ignores or downplays the associated risks
- Physicians should be careful not to place additional pressure on women by portraying egg freezing as something that they should choose to avoid future regret

KEY POINTS....

- Does not provide women with the same reproductive longevity that men enjoy, but it can allow women to delay childbearing for 2 to 10 years and may be a reasonable choice for women wishing to do this
- Enhances reproductive autonomy, age-related obstetric complications, economic implications and the risk of unsuccessful future treatment make this a controversial therapeutic option.
- Some women have no reasonable alternative, such as single women approaching their late thirties - offers hope by extending the window of opportunity to find a partner
- Physicians should also discuss financial, ethical and societal implications with women considering social egg freezing
- Given the upward trend in women electively cryopreserving their eggs, it would appear that a new ice age, from a fertility perspective, is upon us

OVARIES REMAIN PROGRAMMED FOR REPRODUCTION AT A YOUNGER AGE

SEF may be able to "bridge the gap between reproductive prime and when a woman is realistically 'ready' to have children

"Back-up plan" or "Fertility insurance"

MANAGING IVF PREGNANCIES

Dr. MADHUMITHA ARUNKARTHIK,
MS, DNB (OBG), FRM, FMAS
CONSULTANT,
ALPHALIFE FERTILITY & WOMEN'S CENTER

- Little is known about "Ideal" monitoring of patients who conceive after IVF treatment
- One thought would be that after a long period of living in preparation for a future pregnancy, patients should be well prepared
- High anxiety levels of these patients (and doctors) might make them over-utilize antenatal care which at times may lead to over treatment

HOW ARE IVF PREGNANCIES DIFFERENT FROM NORMAL PREGNANCIES

- The "Age" Factor
  - » Age of women conceiving by ART is significantly higher than age of women conceiving naturally.
  - » This lone variable accounts for an increase in the incidence of maternal-fetal complications
- Miscarriages
  - » incidence of miscarriage in pregnancies resulting from ART is higher than in spontaneous pregnancies
- Multiple pregnancies
  - » In natural conceptions, one in 80 pregnancies results in twins. In ART, rate of multiple pregnancies is more than 1/5
  - » Apart from the increased rate of twins, higher order births which are extremely rare in natural conceptions occur commonly in women undergoing ART.
- Obstetric complications
  - » The incidence of first trimester bleeding, PIH, Placenta Previa, Preterm labour, IUGR, Intra Uterine fetal death, Caesarean Section is higher in IVF Pregnancies.

- » Even when maternal variables such as age and parity are matched, the risk of these complications is higher therefore demanding extra vigilance.

- Congenital Malformations

The possible reasons are attributed to:

- » -Increased maternal age: Oocyte and sperm abnormalities increase with increasing age
- » -the more the number of oocytes in a stimulated cycle, the higher is the incidence of aneuploidy.
- » -ICSI in male infertility leading to transmission of genetic causes such as Y chromosomal microdeletions, ultra structural sperm defects with genetic basis.
- » -Embryo is exposed to mechanical, thermal and chemical alterations which theoretically can increase the risk of congenital malformations.
- » -Increased risk of Imprinting disorders such as Beckwith Wiedmann syndrome, Angelman syndrome etc.
- » -Cryopreservation can theoretically increase this risk.

- Pscychological factors:
  - » IVF parents are more anxious than matched controls about the survival and normality of the unborn babies.
  - » These findings of increased psychological stress necessitate intense counseling of patients undergoing IVF.

QUERIES AND FACTS

What genetic conditions should be discussed with patients considering to undergo or who have undergone in IVF?

- The IVF procedure itself does not appear to lead to a higher prevalence of chromosomal anomalies when compared with naturally occurring pregnancies
- Factors playing a role in the increased risk for chromosomal anomalies
  - » Age
  - » PCOS
  - » Primary amenorrhoea
  - » RPL
  - » POF
  - » SOATS
  - » IVF/ICSI

Home › Archives of Gynecology and Obstetrics › Article

Maternal-Fetal Medicine | Published: 15 February 2018

The effect of assisted reproductive technology on the incidence of birth defects among livebirths

Gil Shechter-Maor, Nicholas Czuzoj-Shulman, Andrea R. Spence & Haim Arie Abenhaim

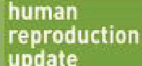
Archives of Gynecology and Obstetrics **297**, 1397–1403 (2018) | Cite this article

1040 Accesses | **16** Citations | **4** Altmetric | Metrics

Conclusions

There is an overall and type-specific increased risk of birth defects in the ART population. Appropriate counseling and specialized ultrasound evaluations should be considered in pregnancies conceived by ART.

Human Reproduction Update, Vol.20, No.6 pp. 840–852, 2014
Advanced Access publication on June 24, 2014 doi:10.1093/humupd/dmu033



A systematic review and meta-analysis of DNA methylation levels and imprinting disorders in children conceived by IVF/ICSI compared with children conceived spontaneously

Gabija Lazaraviciute[1], Miriam Kauser[1], Sohinee Bhattacharya[1], Paul Haggarty[2], and Siladitya Bhattacharya[1,*]

[1]Division of Applied Health Sciences, University of Aberdeen, Foresterhill, Aberdeen AB25 2ZD, UK [2]Division of Lifelong Health, Rowett Institute of Nutrition and Health, University of Aberdeen, Greenburn Road, Bucksburn, Aberdeen AB21 9SB, UK

*Correspondence address. Division of Applied Health Sciences, University of Aberdeen, Head, Foresterhill, Aberdeen AB25 2ZD, UK. E-mail: s.bhattacharya@abdn.ac.uk

Submitted on December 11, 2013; resubmitted on May 22, 2014; accepted on May 29, 2014

WHAT ARE THE DIFFERENT TYPES OF PREIMPLANTATION GENETIC TESTING?

- Preimplantation genetic testing for aneuploidy (PGT-A)
- preimplantation genetic testing for monogenic disorders (PGT-M)
- preimplantation genetic testing for structural (chromosomal) rearrangements (PGT-SR)
- Embryo mosaicism is present in an estimated 16% to 21% of blastocysts
- If euploid embryos are unavailable, aneuploid mosaic embryos are sometimes transferred, because a mosaic embryo can develop into a healthy euploid fetus.
- PGT-A does not replace the recommendation for prenatal screening or diagnosis.
- PGT-A samples the trophoectoderm, which gives rise to the placenta, not the inner cell mass, which gives rise to the fetus.
- Discordant aneuploidy findings between trophoectoderm and inner cell mass are reported to be as high as 50% in discarded frozen embryos.

WHAT IS THE ACCURACY OF FIRST-TRIMESTER GENETIC SCREENING TESTS IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

Maternal serum screening markers and nuchal translucency measurements in in vitro fertilization pregnancies: a systematic review

Andrea Lanes, M.Sc.,[a,b] Tianhua Huang, Ph.D.,[b] Ann E. Sprague, Ph.D.,[b,f] Arthur Leader, M.D., F.R.C.S.C.,[d,e] Beth Potter, Ph.D.,[a] and Mark Walker, M.D., F.R.C.S.(C.)[b,c,d,f]

[a] School of Epidemiology, Public Health and Preventive Medicine, University of Ottawa; [b] BORN Ontario, CHEO Research Institute; [c] Ottawa Hospital Research Institute, Center for Practice-Changing Research; [d] Department of Obstetrics and Gynecology, University of Ottawa; [e] Ottawa Fertility Centre; and [f] CHEO Research Institute, Centre for Practice-Changing Research, Ottawa, Ontario, Canada

Objective: To study the current literature on the association between IVF treatment and maternal serum screening marker levels and nuchal translucency thickness.
Design: Systematic review.
Settings: Not applicable.
Patient(s): Eligible studies included those with an exposed group of pregnant women that used IVF with or without intracytoplasmic sperm injection to conceive and a control group of pregnant women who conceived spontaneously.
Intervention(s): IVF treatment to conceive.
Main Outcome Measure(s): Outcomes evaluated included maternal serum screening markers (pregnancy-associated plasma protein A [PAPP-A], alpha-fetoprotein, hCG, unconjugated estriol, dimeric inhibin-A) and nuchal translucency thickness.
Result(s): Database searches identified 4,118 titles and abstracts that were independently screened, which resulted in 76 articles that were assessed for eligibility. Additionally, one study was added for consideration based on expert knowledge. There were 29 cohort and 11 case-control studies in the descriptive review. The most commonly reported markers were PAPP-A and free β-hCG, which were reported in 28 and 26 studies, respectively. The studies that reported effect sizes for PAPP-A and free β-hCG were not statistically significant.
Conclusion(s): A decrease in PAPP-A and an increase in total hCG was consistently reported among the included studies. However, owing to the variability in the levels of the other maternal serum screening markers reported and the inability to conduct a meta-analysis, we were unable to generalize about the differences between prenatal screening results in the IVF population. (Fertil Steril® 2016;106:1463–9. ©2016 by American Society for Reproductive Medicine.)
Key Words: In vitro fertilization, maternal serum screening markers, systematic review

Discuss: You can discuss this article with its authors and with other ASRM members at https://www.fertstertdialog.com/posts/11309-maternal-serum-screening-markers-and-nuchal-translucency-measurements-in-in-vitro-fertilization-pregnancies-a-systematic-review

Review > Prenat Diagn. 2017 Jun;37(6):540-555. doi: 10.1002/pd.5052. Epub 2017 May 29.

Nuchal translucency measurement, free β-hCG and PAPP-A concentrations in IVF/ICSI pregnancies: systematic review and meta-analysis

Paolo Cavoretto [1], Veronica Giorgione [1], Sonia Cipriani [2], Paola Viganò [1], Massimo Candiani [1], Annalisa Inversetti [1], Elena Ricci [2], Fabio Parazzini [2]

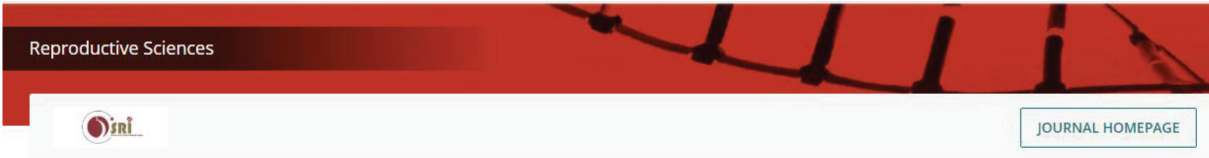
Affiliations + expand

PMID: 28419502 DOI: 10.1002/pd.5052

Abstract

So far, data on the effect of assisted reproductive technologies (ART) on the components of first trimester combined screening for Down syndrome are still controversial. A systematic search of the literature was performed in order to identify the effect of ART, particularly in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) with fresh embryo transfer, on the nuchal translucency, free beta-human chorionic gonadotrophin and pregnancy-associated plasma protein-A measurements. Moreover, a meta-analysis and a descriptive graphical representation of the ratios between ART and spontaneous pregnancies (controls) values of median of the multiple of median (m_0 MoM) were performed. Free beta-human chorionic gonadotrophin test showed slightly higher values in the ICSI group than controls (RR = 1.09, 95%CI: 1.03-1.16) but not in the IVF group (RR = 1.03, 95%CI: 0.94-1.12). Pregnancy-associated plasma protein-A values for IVF/ICSI, IVF and ICSI showed lower values in comparison with controls (RR, 95%CI 0.85, 0.80-0.90; 0.82, 0.74-0.89 and 0.83, 0.79-0.86, respectively). The nuchal translucency measurement did not show any statistical differences between study groups (IVF and ICSI) and controls (RR = 1.00, 95%CI: 0.94-1.08 and RR = 1.01, 95%CI: 0.97-1.05, respectively). These results may be due to alterations in the placentation of ART pregnancies. Differentiating further subgroups of ART pregnancies may explain the differences in biomarker concentrations, in prenatal behavior and in obstetric outcomes between ART and spontaneous pregnancies. © 2017 John Wiley & Sons, Ltd.

CFDNA



Restricted access | Research article | First published online April 12, 2016

Are There Differences in Placental Volume and Uterine Artery Doppler in Pregnancies Resulting From the Transfer of Fresh Versus Frozen-Thawed Embryos Through In Vitro Fertilization

Giuseppe Rizzo, MD, Elisa Aiello, MD, [...], and Domenico Arduini, MD (+1) View all authors and affiliations

Volume 23, Issue 10 | https://doi.org/10.1177/1933719116641765

human reproduction ORIGINAL ARTICLE *Early pregnancy*

Cell-free fetal DNA testing in singleton IVF conceptions

Timothy J. Lee[1,2], Daniel L. Rolnik[2], Melody A. Menezes[3], Andrew C. McLennan[4,5], and Fabricio da Silva Costa[2,3,*]

[1]Faculty of Medicine, Nursing and Health Sciences, Monash University, Victoria 3800, Australia [2]Department of Obstetrics and Gynaecology, Monash University, 246 Clayton Road, Clayton, Victoria 3168, Australia [3]Monash Ultrasound for Women, The Epworth Centre, Suite 2.5, Level 2, 32 Erin Street, Richmond, Victoria 3121, Australia [4]Discipline of Obstetrics, Gynaecology and Neonatology, University of Sydney, New South Wales 2006, Australia [5]Sydney Ultrasound for Women, Suite 4.01, 45-47 York Street, Sydney, New South Wales 2000, Australia

*Correspondence address. Department of Obstetrics and Gynaecology, Monash University, 246 Clayton Road, Clayton, Victoria 3168, Australia. Tel: +61-42-980-1 977; Email: fcosta@monashultrasound.com.au

Submitted on December 7, 2017; resubmitted on January 21, 2018; accepted on January 31, 2018

STUDY QUESTION: Are fetal fraction, test failure rate and positive predictive value (PPV) of cell-free fetal DNA (cffDNA) testing different in singleton IVF conceptions compared to spontaneous conceptions?

SUMMARY ANSWER: Fetal fraction is significantly lower; test failure rate is higher and PPV of cffDNA testing is lower in singleton pregnancies conceived by IVF than those conceived spontaneously.

WHAT IS ALREADY KNOWN: cffDNA testing, which analyses circulating cffDNA in maternal blood, has very high accuracy for detection of trisomy 21 in the general obstetric population. Focused and conclusive evidence regarding the test characteristics of cffDNA testing in IVF conceived pregnancies is lacking.

STUDY DESIGN, SIZE, DURATION: This was a retrospective cohort study including spontaneously and IVF conceived singleton pregnancies collected consecutively between April 2013 and November 2016. A total of 4633 spontaneously conceived and 992 IVF pregnancies were included.

PARTICIPANTS/MATERIALS, SETTING, METHODS: The study was performed at an obstetric and gynecological ultrasound clinic in Melbourne, Australia. Participants had screening for trisomies 21, 18 and 13, as well as sex chromosome aneuploidies (SCA) performed with cffDNA testing after 10 weeks' gestation. Multivariate regression analysis was used to determine significant predictors of logarithmically transformed fetal fraction and test failure. Comparison of test characteristics between study groups was performed adopting a significance level of 5%.

MAIN RESULTS AND THE ROLE OF CHANCE: Median fetal fraction was lower (10.3% [interquartile range (IQR), 7.7–13.5] versus 11.9% [IQR, 9.1–15.0]; $P = 0.005$), test failure rate was higher (5.2 versus 2.2%; $P < 0.001$) and positive predictive value (PPV) for trisomies 18, 13 and SCA was poorer in IVF pregnancies compared to those spontaneously conceived. Multivariate linear regression analysis demonstrated that IVF conception, increased BMI, earlier gestational age and South and East Asian ethnicities were independent predictors of lower fetal fraction. Multiple logistic regression analysis found IVF conception and increased BMI to be independently associated with test failure. PPV was high for trisomy 21 in IVF conception (100.0%), but was lower for other trisomies when compared with the non-IVF population.

LIMITATIONS REASONS FOR CAUTION: IVF details were unascertainable for 210 cases, as the information was not available through our data collection points. Inability to karyotype some cases at high-risk for SCA, due to patients' choice, and the occurrence of miscarriages and terminations, resulted in the exclusion of high-risk cases when calculating PPV. Pregnancy outcomes were not available in low-risk pregnancies and negative predictive values could not be calculated.

WIDER IMPLICATIONS OF THE FINDINGS: The limitations revealed by this work should be taken into account during pre-test counseling in pregnant women who conceive by IVF.

STUDY FUNDING/COMPETING INTEREST(S): No external source of financial support was provided for this research. The authors report no conflicts of interest.

Conclusion:

First-trimester placental volume, as assessed by 3D ultrasound, is reduced in IVF pregnancies, and these differences are more marked in those obtained with **fresh embryos** than those obtained with **cryopreservation**. This may explain the better obstetrical and perinatal outcomes occurring with the former technique.

DOES MULTIFETAL PREGNANCY REDUCTION REDUCE THE RISKS ASSOCIATED WITH MULTIPLE GESTATIONS?

- The odds of a monozygotic twin pregnancy after transfer at the blastocyst stage compared with the cleavage stage is 2.18
- When multifetal pregnancies do occur, counseling to be offered regarding the option of multifetal pregnancy reduction
- Multifetal pregnancy reduction has been shown to reduce the risks of preterm birth, neonatal morbidity, and maternal complications

ACOG COMMITTEE OPINION

Number 719 • September 2017 *(Replaces Committee Opinion Number 553, February 2013)*

Committee on Ethics

The Society for Maternal–Fetal Medicine endorses this document. This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Committee on Ethics.

Multifetal Pregnancy Reduction

ABSTRACT: Although not all multifetal pregnancies occur after the use of assisted reproductive technology, fertility treatments have contributed significantly to the increase in multifetal pregnancies. In almost all cases, it is preferable to avoid the risk of higher-order multifetal pregnancy by limiting the number of embryos to be transferred or by cancelling a gonadotropin cycle when the ovarian response suggests a high risk of a multifetal pregnancy. When multifetal pregnancies do occur, incorporating the ethical framework presented in this Committee Opinion will help obstetrician–gynecologists counsel and guide patients as they make decisions regarding continuing or reducing their multifetal pregnancies.

Recommendations

On the basis of the principles outlined in this Committee Opinion, the American College of Obstetricians and Gynecologists (ACOG) makes the following recommendations:

- Fertility treatments have contributed significantly to the increase in multifetal pregnancies. Primary prevention strategies to limit multifetal pregnancies, especially higher-order multifetal pregnancies, can help to minimize the need for multifetal pregnancy reduction and should be practiced by all physicians who treat women for infertility.
- Obstetrician–gynecologists should be aware that multifetal pregnancies increase maternal and perinatal morbidity and mortality. Higher-order multifetal pregnancies present higher risks than do twin pregnancies.
- Obstetrician–gynecologists should be knowledgeable about the medical risks of multifetal pregnancy, the potential medical benefits of multifetal pregnancy reduction, and the complex ethical issues inherent in decisions regarding multifetal pregnancy reduction. They should be prepared to respond in a professional and ethical manner to patients who request or decline to receive information, or intervention, or both.
- Nondirective patient counseling should be offered to all women with higher-order multifetal pregnancies and should include a discussion of the risks unique to multifetal pregnancy as well as the option to continue or reduce the pregnancy. Resources for providing such counseling can include maternal–fetal medicine specialists, neonatologists, mental health professionals, child development specialists, support groups, and clinicians with procedural expertise in multifetal pregnancy reduction.
- When a patient's request for information on multifetal pregnancy reduction is discordant with a physician's values, the physician should refer the patient for consultation in a timely fashion and without judgment, explain to the patient the reason for the consultation, and provide all necessary information to the consultant.
- Obstetrician–gynecologists should respect patients' autonomy regarding whether to continue or reduce a multifetal pregnancy. Only the patient can weigh the relative importance of the medical, ethical, religious, and socioeconomic factors and determine the best course of action for her unique situation.

Introduction

Multifetal pregnancy reduction is defined as a first-trimester or early second-trimester procedure for reducing the total number of fetuses in a multifetal pregnancy by one or more (1). In most cases, the involved gestations will be higher-order multifetal pregnancies, defined by the presence of three or more fetuses. Throughout the document, multifetal pregnancy reduction is used to refer to reduction of a higher-order multifetal pregnancy by

ARE CONGENITAL ANOMALIES INCREASED IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

TABLE

Pooled estimates of rates (per 1000) for specific congenital anomalies in singleton pregnancies following in vitro fertilization, with or without intracytoplasmic sperm injection compared with naturally occurring pregnancies (95% confidence interval)

Organ system	IVF with or without ICSI pregnancies	Naturally occurring pregnancies
Cleft lip or palate	1.3 (0.9–1.7)	1.2 (1.0–1.6)
Eye, ear, face, neck	1.7 (0.8–3.6)	1.5 (0.8–2.8)
CNS	1.7 (1.2–2.4)	1.7 (1.2–2.6)
Respiratory system	0.8 (0.4–1.6)	0.8 (0.5–1.4)
GI	3.8 (2.4–6.0)	2.5 (1.4–4.5)
Musculoskeletal	11.0 (6.7–18.1)	8.1 (4.7–13.6)
Urogenital	10.9 (6.9–17.2)	6.4 (4.5–9.1)
Cardiovascular	5.7 (5.3–11.2)	5.2 (4.5–9.1)

Data from Chen et al.[54]

CI, confidence interval; *CNS*, central nervous system; *GI*, gastrointestinal; *ICSI*, intracytoplasmic sperm injection; *IVF*, in vitro fertilization.

Society for Maternal-Fetal Medicine. SMFM Consult Series #60: Management of pregnancies resulting from in vitro fertilization. Am J Obstet Gynecol 2022.

ARE PLACENTAL ANOMALIES INCREASED IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

- Several placental implantation disorders are more common with IVF
- Pregnancies achieved with IVF are associated with higher risks for
- abnormal placental shape (bilobed placenta, accessory placental lobes)
- Placenta accreta spectrum
- \- placenta previa
- (The risk of placenta previa -higher for pregnancies achieved after blastocyst transfer than for pregnancies achieved after cleavage-stage transfer and naturally occurring pregnancies)

.--Karami M, Jenabi E, Fereidooni B. The association of placenta previa and assisted reproductive techniques: a meta-analysis. J Matern Fetal Neonatal Med 2018;31:1940–7.

-Ginström Ernstad E, Bergh C, Khatibi A, et al. Neonatal and maternal outcome after blastocyst transfer: a population-based registry study. Am J Obstet Gynecol 2016;214:378.e1–10

IS THE PREVALENCE OF SPONTANEOUS PRETERM BIRTH HIGHER IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

Meta-Analysis > Obstet Gynecol. 2004 Mar;103(3):551-63.
doi: 10.1097/01.AOG.0000114989.84822.51.

Perinatal outcomes in singletons following in vitro fertilization: a meta-analysis

Rebecca A Jackson [1], Kimberly A Gibson, Yvonne W Wu, Mary S Croughan

Tabulation, integration, and results: Fifteen studies comprising 12,283 IVF and 1.9 million spontaneously conceived singletons were identified. Random-effects meta-analysis was performed. Compared with spontaneous conceptions, IVF singleton pregnancies were associated with significantly higher odds of each of the perinatal outcomes examined: perinatal mortality (odds ratio [OR] 2.2; 95% confidence interval [CI] 1.6, 3.0), preterm delivery (OR 2.0; 95% CI 1.7, 2.2), low birth weight (OR 1.8; 95% CI 1.4, 2.2), very low birth weight (OR 2.7; 95% CI 2.3, 3.1), and small for gestational age (OR 1.6; 95% CI 1.3, 2.0). Statistical heterogeneity was noted only for preterm delivery and low birth weight. Sensitivity analyses revealed no significant changes in results. Early preterm delivery, spontaneous preterm delivery, placenta previa, gestational diabetes, preeclampsia, and neonatal intensive care admission were also significantly more prevalent in the IVF group.

Conclusion: In vitro fertilization patients should be advised of the increased risk for adverse perinatal outcomes. Obstetricians should not only manage these pregnancies as high risk but also avoid iatrogenic harm caused by elective preterm labor induction or cesarean.

- Compared with natural-cycle IVF, live births after stimulated IVF cycles have significantly higher risks for preterm birth and low birthweight
- Pregnancies achieved with IVF after oocyte donation have higher risks than those achieved with autologous oocytes
- However, even in the same patient, pregnancies achieved with ART have higher risks for preterm birth than naturally occurring pregnancies

IS THE PREVALENCE OF FETAL GROWTH RESTRICTION HIGHER IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

Meta-Analysis > Obstet Gynecol. 2004 Mar;103(3):551-63.
doi: 10.1097/01.AOG.0000114989.84822.51.

Perinatal outcomes in singletons following in vitro fertilization: a meta-analysis

Rebecca A Jackson [1], Kimberly A Gibson, Yvonne W Wu, Mary S Croughan

Tabulation, integration, and results: Fifteen studies comprising 12,283 IVF and 1.9 million spontaneously conceived singletons were identified. Random-effects meta-analysis was performed. Compared with spontaneous conceptions, IVF singleton pregnancies were associated with significantly higher odds of each of the perinatal outcomes examined: perinatal mortality (odds ratio [OR] 2.2; 95% confidence interval [CI] 1.6, 3.0), preterm delivery (OR 2.0; 95% CI 1.7, 2.2), low birth weight (OR 1.8; 95% CI 1.4, 2.2), very low birth weight (OR 2.7; 95% CI 2.3, 3.1), and small for gestational age (OR 1.6; 95% CI 1.3, 2.0). Statistical heterogeneity was noted only for preterm delivery and low birth weight. Sensitivity analyses revealed no significant changes in results. Early preterm delivery, spontaneous preterm delivery, placenta previa, gestational diabetes, preeclampsia, and neonatal intensive care admission were also significantly more prevalent in the IVF group.

Conclusion: In vitro fertilization patients should be advised of the increased risk for adverse perinatal outcomes. Obstetricians should not only manage these pregnancies as high risk but also avoid iatrogenic harm caused by elective preterm labor induction or cesarean.

- The degree of the effect of IVF on fetal growth differs by IVF technique: a higher risk for SGA babies in pregnancies achieved via IVF (with or without ICSI) from fresh cycles than with frozen cycles.

Why do singletons conceived after assisted reproduction technology have adverse perinatal outcome? Systematic review and meta-analysis

A Pinborg [1], U B Wennerholm, L B Romundstad, A Loft, K Aittomaki, V Söderström-Anttila, K G Nygren, J Hazekamp, C Bergh

Affiliations + expand

PMID: 23154145 DOI: 10.1093/humupd/dms044

Abstract

Background: Assisted reproduction technology (ART) is used worldwide, at increasing rates, and data show that some adverse outcomes occur more frequently than following spontaneous conception (SC). Possible explanatory factors for the well-known adverse perinatal outcome in ART singletons were evaluated.

Methods: PubMed and Cochrane databases from 1982 to 2012 were searched. Studies using donor or frozen oocytes were excluded, as well as those with no control group or including <100 children. The main outcome measure was preterm birth (PTB defined as delivery <37 weeks of gestation), and a random effects model was used for meta-analyses of PTB. Other outcomes were very PTB, low-birthweight (LBW), very LBW, small for gestational age and perinatal mortality.

Results: The search returned 1255 articles and 65 of these met the inclusion criteria. The following were identified as predictors for PTB in singletons: SC in couples with time to pregnancy (TTP) > 1 year versus SC singletons in couples with TTP ≤ 1 year [adjusted odds ratio (AOR) 1.35, 95% confidence interval (CI) 1.22, 1.50]; IVF/ICSI versus SC singletons from subfertile couples (TTP > 1 year; AOR 1.55, 95% CI 1.30, 1.85); conception after ovulation induction and/or intrauterine insemination versus SC singletons where TTP ≤ 1 year (AOR 1.45, 95% CI 1.21, 1.74); IVF/ICSI singletons versus their non-ART singleton siblings (AOR 1.27, 95% CI 1.08, 1.49). The risk of PTB in singletons with a 'vanishing co-twin' versus from a single gestation was AOR of 1.73 (95% CI 1.54, 1.94) in the narrative data. ICSI versus IVF (AOR 0.80, 95% CI 0.69-0.93), and frozen embryo transfer versus fresh embryo transfer (AOR 0.85, 95% CI 0.76, 0.94) were associated with a lower risk of PTB.

Conclusions: Subfertility is a major risk factor for adverse perinatal outcome in ART singletons, however, even in the same mother an ART singleton has a poorer outcome than the non-ART sibling; hence, factors related to the hormone stimulation and/or IVF methods per se also may play a part. Further research is required into mechanisms of epigenetic modification in human embryos and the effects of cryopreservation on this, whether milder ovarian stimulation regimens can improve embryo quality and endometrial conditions, and whether longer culture times for embryos has a negative influence on the perinatal outcome.

IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION, DOES LOW-DOSE ASPIRIN PROPHYLAXIS REDUCE THE RISK FOR FETAL AND PLACENTAL COMPLICATIONS?

- Hypertensive disorders of pregnancy increased
- Increased risk for preeclampsia in pregnancies achieved with IVF from frozen embryo transfer when compared with fresh embryo transfer
- The United States Preventative Services Task Force states that IVF is a moderate risk factor for preeclampsia and recommends low-dose aspirin if an additional moderate risk factor is found.

Meta-Analysis › Hum Reprod Update. 2019 Jan 1;25(1):2-14. doi: 10.1093/humupd/dmy033.

Fresh versus elective frozen embryo transfer in IVF/ICSI cycles: a systematic review and meta-analysis of reproductive outcomes

Matheus Roque [1 2], Thor Haahr [3], Selmo Geber [2 4], Sandro C Esteves [3 5 6], Peter Humaidan [3 5]

IS THE PREVALENCE OF STILLBIRTH INCREASED IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION?

- Pregnancies achieved with IVF have a 2- to 3-fold increased risk for stillbirth even after controlling for maternal age, parity, and multifetal gestations
- Lower risk with frozen than fresh embryo transfer

Bay B, Boie S, Kesmodel US. Risk of stillbirth in low-risk singleton term pregnancies following fertility treatment: a national cohort study. BJOG 2019;126:253–60.

Marino JL, Moore VM, Willson KJ, et al. Perinatal outcomes by mode of assisted conception and sub-fertility in an Australian data linkage cohort. PLoS One 2014;9:e80398.

Wisborg K, Ingerslev HJ, Henriksen TB. IVF and stillbirth: a prospective follow-up study. Hum Reprod 2010;25:1312–6.

IN PREGNANCIES ACHIEVED WITH IN VITRO FERTILIZATION, DOES DELIVERY AT 39 WEEKS OF GESTATION REDUCE THE RISK FOR ADVERSE PERINATAL OUTCOMES?

- n asymptomatic uncomplicated singleton gestations, induction of labor between 39 and 40 weeks of gestation does not increase the risk for cesarean delivery when compared with expectant management
- It does not reduce the rates of adverse perinatal outcomes, including perinatal death, low Apgar score at 5 minutes, or the need for neonatal intensive care unit admission.

Meta-Analysis > Acta Obstet Gynecol Scand. 2019 Aug;98(8):958-966. doi: 10.1111/aogs.13561. Epub 2019 Mar 6.

Induction of labor at full-term in pregnant women with uncomplicated singleton pregnancy: A systematic review and meta-analysis of randomized trials

Gabriele Saccone [1], Luigi Della Corte [1], Giuseppe M Maruotti [1], Johanna Quist-Nelson [2], Antonio Raffone [1], Valentino De Vivo [1], Gennaro Esposito [1], Fulvio Zullo [1], Vincenzo Berghella [2]

SMFM Consult Series

smfm.org

Summary of recommendations

Number	Recommendations	GRADE
1	We suggest that genetic counseling be offered to all patients undergoing or who have undergone IVF, with or without ICSI.	2C
2	Regardless of whether PGT has been performed, we recommend that all patients who have achieved pregnancy with IVF be offered the options of prenatal genetic screening and diagnostic testing via chorionic villus sampling or amniocentesis.	1C
3	We recommend that the accuracy of first-trimester screening tests, including cfDNA for aneuploidy, be discussed with patients undergoing or who have undergone IVF.	1A
4	When multifetal pregnancies do occur, we recommend that counseling be offered regarding the option of multifetal pregnancy reduction.	1C
5	We recommend that a detailed obstetrical ultrasound examination (CPT 76811) be performed for pregnancies achieved with IVF and ICSI.	1B
6	We suggest that fetal echocardiography be offered to patients with pregnancies achieved with IVF and ICSI.	2C
7	We recommend that a careful examination of the placental location, placental shape, and cord insertion site be performed at the time of the detailed fetal anatomy ultrasound, including evaluation for vasa previa.	1B
8	Although visualization of the cervix at the 18 0/7 to 22 6/7 weeks of gestation anatomy assessment with either a transabdominal or endovaginal approach is recommended, we do not recommend serial cervical length assessment as a routine practice for pregnancies achieved with IVF.	1C
9	We suggest that an assessment of fetal growth be performed in the third trimester for pregnancies achieved with IVF; however, serial growth ultrasounds are not recommended for the sole indication of IVF.	2B
10	We do not recommend low-dose aspirin for patients with pregnancies achieved with IVF as the sole indication for preeclampsia prophylaxis; however, if one or more additional risk factors are present, low-dose aspirin is recommended.	1B
11	Given the increased risk for stillbirth, we suggest weekly antenatal fetal surveillance beginning by 36 0/7 weeks of gestation for pregnancies achieved with IVF.	2C
12	In the absence of studies focused specifically on timing of delivery for pregnancies achieved with IVF, we recommend shared decision-making between patients and healthcare providers when considering induction of labor at 39 weeks of gestation.	1C

Society for Maternal-Fetal Medicine. SMFM Consult Series #60: Management of pregnancies resulting from in vitro fertilization. Am J Obstet Gynecol 2022.

FIRST TRIMESTER: LUTEAL PHASE SUPPORT

- The Practice of luteal phase support is established beyond doubt in patients who have undergone IVF.
- Whatever support is administerd at the point of embryo transfer, should be continued till confirmation of cardiac activity on ultrasound.
- This includes Progesterone +Estrogen
- The questions of when to end luteal supplementation is an area poorly studied
- Most IVF practitioners arbitrarily start Progesterone supplementation after oocyte retrieval and elect to continue it, if the patient is pregnant
- Progesterone being a relatively safe drug with minimal side effects may therefore be continued till 12 weeks.
- Discontinuation of progesterone supplementation initiated for the sole purpose of IVF is recommended by 12 weeks.

ANC

- Ante Natal Care after the first trimester in patients conceiving after IVF is no different than normal conceptions.
- In the second trimester cervical length assessment should be done at around 14 weeks both by USG and clinically keeping in mind risk factors such as congenital malformations of the uterus, previous second trimester losses and multiple gestation.
- In all patients who are at risk of developing threatened preterm, prophylactic tocolysis may be offered and continued till 34 weeks.
- Routine ANC should be provided with special attention towards high risk factors such as PIH, Gestational Diabetes, Multiple gestation etc.
- All monitoring should be done at a tertiary referral center to ensure multidisciplinary care and also management of antenatal complications incase they arise.
- IVF is associated with an increased risk for several adverse maternal and perinatal outcomes.
- However, evidence is limited regarding whether specific screening, diagnostic, or preventative interventions during pregnancy obviate or reduce such risks.
- Specific technical characteristics of IVF in addition to the presence of underlying infertility, affect the risks for adverse clinical outcomes.
- Therefore, individualization of care may be ideal for optimizing outcomes.

STILLBIRTH AT 36 WEEKS - WHAT NEXT?

Dr. M. ANKITHA,
MS (OG), FNB (REPRODUCTIVE MEDICINE)
CLINICAL DIRECTOR & IVF CONSULTANT
RPS HOSPITAL, SALEM.

BREAKING BAD NEWS:

Parents are unprepared and in distress: 50% of late fetal deaths occur in apparently uncomplicated pregnancies.

CHECKLIST:

Provide privacy:

- Assemble important decision-making members of the family along with the patient.
- Senior member of team to break the news/ Keep the most experienced member of support staff with you (midwife/nurse)
- Make sure that privacy does not feel to the parents as if they have been abandoned.
- Do not appear to be secretive

Acknowledge the death of the baby:

- "I cannot find your baby's heartbeat. Your baby is not alive. I am sad to say that your baby has died. I am sorry for your loss."
- Tell the mother directly that her baby has died. Use clear, simple, direct language.
- You should not ask her husband/family member to tell her about this news on your behalf.
- Avoid using language which might sound like you are blaming the parents.
- Alert other staff to the stillbirth so they don't inadvertently ask about the baby and upset the mother.

Inquire about baby's name:

- "Have you thought of a name for the baby? (if yes) Would you allow me to use that name to talk about your baby?"

Ask about seeing and holding the baby:

- "Many women have found it helpful to see and hold their stillborn baby after she or he is born. Would you like to do this?"
- Offer support to enable this to happen and tell them what to expect regarding the baby's appearance.
- Some parents may want to see the anomaly.
- You can explain what you propose to do with the body.

Preparing the baby:

- If the mother wants to see her baby, prepare the body by bathing and wrapping it in cloth.

Seeing and holding the baby:

- Gently show the baby first. If the mother feels comfortable looking at her baby, then offer her to hold the baby.
- Developing a connection with the baby makes the death real, helps prevent emotional withdrawal from the loss and helps transition to parenthood.

Ask about making memories:

- Footprints/Photos
- Having baby's photograph may help in coping in times of grief.

REPURCUSSIONS:

- Reactions are going to be varied and difficult – angry at the obstetrician, angry at people around you
- Finger pointing: blaming the care provider
- The saddest part is when we are telling the patient, we are angry too, angry at ourselves.
- We are as unprepared as the patient when it happens the first time.

OBSTETRIC MANAGEMENT:

Wait or induce:

- In majority of cases, spontaneous labour begins within 1-2 weeks of fetal death.
- Waiting increases the risk of developing coagulation abnormalities if the dead fetus is retained for several weeks. Due to the gradual release of tissue factor from the placenta into the maternal circulation.

- Approximate incidence of coagulation abnormalities: 1.9%
- No rushed decisions if no DIC/preeclampsia with severe features/signs of infection.

Induction of labour:

- Favourable cervix: Bishop's score more than 6– oxytocin
- Unfavourable cervix: Transcervical Foley for ripening +/- oxytocin/Misoprostol
- No hysterotomy scar:
- Misoprostol 50 mcg vaginally, every 4 hours, maximum of 6 doses
- Monitor contractions
- If expulsion does not occur in the first 24 hours, the misoprostol regimen can be repeated second time
- Oxytocin can be initiated four hours after administration of the last misoprostol dose if needed for further augmentation of labour.
- No optimum regimen
- Placenta previa: CS
- Prev CS: VBAC unless patient chooses to have a repeat CS
- Higher risk of rupture as labour needs to be induced
- One of the two major clinical signs of uterine rupture, FHR abnormalities, is not available.
- Abdominal pain may be obscured with epidural analgesia
- Induce with transcervical balloon f/b oxytocin
- Maybe better to avoid misoprostol
- Fetopelvic Disproportion: CS
- Shoulder presentation/large anomalies
- Value of destructive procedures

History and examination:

- Current pregnancy:
  - » Maternal age
  - » Gestational age at stillbirth
  - » Medical conditions complicating pregnancy: Cholestasis
  - » Pregnancy weight gain and BMI
  - » Multifetal gestation
  - » Placental abruption

  - » Abdominal trauma
  - » PPROM/PTL
  - » GA at onset of prenatal care
  - » Abnormalities seen on USG image
  - » Infections/chorioamnionitis
- Obstetric history:
  - » Recurrent miscarriages
  - » Previous IUD
  - » Prev GDM/GHT/PET
  - » Previous child with anomaly/growth restriction/hereditary condition
- Maternal history:
  - » Previous VTE
  - » DM/HT
  - » Thrombophilia
  - » SLE
  - » Autoimmune disease
  - » Epilepsy
  - » Severe anemia
  - » Heart disease
  - » Tobacco/alcohol/drug/medication
- Family history:
  - » Recurrent spontaneous abortions
  - » VTE
  - » Congenital anomaly or chromosomal abnormalities
  - » Hereditary condition or syndrome
  - » Developmental delay
  - » Consanguinity

Investigations:

- Personal or family history of thrombosis in the mother: APLA
- Suspected cholestasis: Bile acids, LFT
- Baby to be examined at birth and full autopsy to be offered, if unwilling, take MRI, NIA, MIA, clinical photographs.

- Do sugars for mother in case of LGA baby
- FGR or SGA baby: HbA1c, APLA, infectious diseases eg: CMV
- Placental examination by macroscopic examination, HPE studies and cytogenetic analysis

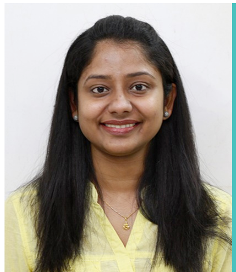
Management of next pregnancy:

- Increased risk of stillbirth was found among women with a history of any stillbirth (2.5%) compared with those with a history of live birth (0.4%)
- How long to wait before next pregnancy?
- No compelling evidence regarding the optimum interpregnancy interval after a stillbirth: advice parents to delay conception until they feel they have achieved psychological closure of the previous pregnancy loss which takes 6-12 months
- Risk of adverse pregnancy outcomes appears to be lower when the interpregnancy interval is more than 6 months
- Thorough evaluation of the cause of the first stillbirth : Do APLA testing if relevant
- Preconception management: Optimize weight and medical conditions (DM/HT/Thyroid/SLE), smoking cessation, substance abuse check
- Dating ultrasonography
- First-trimester screen: pregnancy-associated plasma protein A, human chorionic gonadotropin, and nuchal translucency* or cell-free fetal DNA testing
- Fetal sonographic anatomic survey at 18–20 weeks
- Offer genetic screening if not performed in the first trimester
- Single marker alpha fetoprotein if first trimester screening 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
- Delivery
- Planned delivery at 39 0/7 weeks of gestation or as dictated by other maternal or fetal comorbid conditions.
- In cases of severe patient anxiety: proceed with early term delivery (37 0/7 weeks to 38 6/7 weeks) to prevent recurrent stillbirth,
- Explain increased risks of neonatal complications with early term delivery compared with the potential benefit.

REFERENCES:

- https://www.stillbirthalliance.org/wp-content/uploads/2023/04/PVI-INDIA-TOOLKIT_EDIT_-09_09_2022.pdf
- https://learn.stillbirthcre.org.au/
- https://stillbirthindia.org/BereavedFamily.aspx
- ACOG/SMFM: Number 10 : Management of stillbirth

GENDER IS BETWEEN YOUR EARS AND NOT BETWEEN YOUR LEGS



Dr. NIVEDITA ANANTHASUBRAMANIAN, DNB (OG), FRM
Consultant infertility Specialist - Dr Aravinds IVF

GENDER DYSPHORIA ==============WHO AM I? A HE/SHE/ME

The Origin of the word gender came from the latin word "genus" (old French gendre) meaning "kind, type or sort". Children get assigned to gender at birth based on their anatomy and chromosomes. For most children this assignment corresponds to their gender identity, an innate sense of identifying oneself as male or female. This leads the society to put us in a particular box of identification but there are some individuals who fail to check these boxes. That's where the questioning of oneself starts. This process of questioning, sense of non-belonging with inability to adapt leads to huge upheaval in the life of the individual as well as his family. It's our duty as the caregiver to help the individual and the family to deal with the present situation. For us to be able to do so, we need to be familiar with the new terminologies.

Definitions of Terminology Regarding Sex and Gender:

- Sex: refers to biological characteristics, such as genitals, chromosomes, and hormones, used to categorize a person as male or female sex.
- When a person is transgender, a phrase used to refer to their birth sex is "sex assigned at birth"; a person may be a male assigned at birth (AMAB) or female assigned at birth (AFAB).
- Gender identity: How people see themselves, whether as masculine, feminine, or some other gender identity, which may or may not correspond to the sex they were assigned at birth. Examples of gender-diverse identities include genderqueer, gender nonbinary, and other gender identities.
- Gender expression: How people present themselves in public in terms of gender. It may include the way people dress, speak, or wear their hair.
- Gender dysphoria: A diagnosis a doctor may make when a person with gender incongruence experiences significant psychological or functional impairment associated with the gender incongruence. The diagnosis is defined by the person's

distress rather than by the presence of gender incongruence. The distress is typically a combination of anxiety, depression, and irritability.

- Cisgender: Used to describe people whose gender identity and gender expression align with the sex assigned at birth.
- Transgender: A general term that describes people with gender identities or gender expressions that differ from those typically associated with the sex they were assigned at birth. (Transsexual is an outdated term that is no longer used by experts in gender identity.)
- Gender nonconforming: Describes people whose gender identity or gender expression differs from the gender norms associated with the sex they were assigned at birth.
- Genderqueer: Describes people whose gender identity is not strictly male or female and may include both or neither.
- Gender nonbinary: Describes people who have more than one gender identity simultaneously or at different times.
- Transwomen: People who were assigned male at birth (AMAB) and have adopted a gender identity as a woman, regardless of whether they have undergone any medical gender transition.
- Transmen: People who were assigned female at birth (AFAB) and have adopted a gender identity as a man, regardless of whether they have undergone any medical gender transition.
- Trans-affirmative: Being aware, respectful, and supportive of the needs of transgender and gender-nonconforming individuals.
- Sexual orientation: Pattern of emotional, romantic, and/or sexual attractions that people have toward others.
- Adapted from a glossary of terms from the American Psychological Association.

WHAT????

Children usually start identifying gender between 3 to 5 years of age.

Gender dysphoria (previously gender identity disorder), according to the **Diagnostic and Statistical Manual of Mental Disorders**, is defined as a "marked incongruence between their experienced or expressed gender and the one they were assigned at birth."

This constant tug of war between what they feel and what they are expected to be leads to immense emotional turmoil, leading to relationship conflicts with family, peers and friends.

This mental trauma eventually leads to rejection from society, interpersonal conflicts, symptoms of depression and anxiety, substance use disorders, a negative sense of well-being, and poor self-esteem, and increased risk of self-harm and suicidality. (1)

WHY????

Renowned psychoanalyst Sigmund Freud emphasized that gender dysphoria arises in children from oedipal triangle conflicts.

It can be seen in individuals born with congenital adrenal hyperplasia or androgen insensitivity syndrome as they are usually brought up as girls, even though they often cross-dress and have an innate sense of belonging to the opposite sex.

- In-utero exposure to phthalates in plastics and polychlorinated biphenyls can disrupt the regular endocrinology of sex determination before birth.
- Phthalates can also lead to an increase in total fetal testosterone levels, which in turn increases the risk of autism spectrum disorder as well as gender dysphoria.
- As Gender dysphoria has high prevalence in individuals with schizophrenia and autism disorder, neuroanatomical link should also be researched.
- It is observed that GD is more prevalent in monozygotic twins than in dizygotic twins. Some alleles (CYP17 and CYP17 T-34C) have also been found to have an association, although it is difficult to say if it is merely association or causation. (2,3,4)
- History of Childhood abuse, neglect, maltreatment, and physical or sexual abuse may also be associated with GD.

HOW?????

Diagnosis (per DSM- V)

Gender dysphoria in children

A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least six months duration, as manifested but at least six of the following (one of which must be criteria A1)

1. A strong desire to be of the other gender or an insistence that they are the other gender (or some alternative gender different from one's assigned gender)
2. In boys (assigned gender), a strong preference for cross-dressing or simulating female attire or, in girls (assigned gender), a strong preference for wearing only typical masculine clothing and strong resistance to wearing typical feminine clothing
3. A strong preference for cross-gender roles in make-believe play or fantasy play
4. A strong preference for the toys, games, or activities stereotypically used or engaged in by the other gender.
5. A strong preference for playmates of the other gender
6. In boys (assigned gender), a strong rejection of typically masculine toys, games, and activities and a strong avoidance of rough-and-tumble play or, in girls (assigned gender), a strong rejection of typically feminine toys, games, and activities.

7. A strong dislike of one's sexual anatomy
8. A strong desire for the primary and/or secondary sex characteristics matching one's experienced gender.

B. The condition is associated with clinically significant distress or impairment in social, school, or other important areas of functioning.

Clinicians need to specify: if the above criteria are in addition to a disorder of sex development (e.g., a congenital adrenogenital disorder such as congenital adrenal hyperplasia or androgen insensitivity disorder).

Gender dysphoria in adolescents and adults

A. A marked incongruence between one's experienced/expressed gender and assigned gender of at least six months duration, as manifested by at least two of the following:

1. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or, in young adolescents, the anticipated secondary sex characteristics).
2. A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or, in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics).
3. A strong desire for the primary and/or secondary sex characteristics of the other gender.
4. A strong desire to be of the other gender (or some alternative gender different from one's assigned gender).
5. A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender).
6. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender).

B. The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Clinician need to specify:

- Whether a disorder of sexual development exists (e.g., a congenital adrenogenital disorder such as congenital adrenal hyperplasia or androgen insensitivity syndrome)
- **Post-transition:** the individual has transitioned to full-time living in the desired gender (with or without legalization of gender change) and has undergone (or is preparing to have) at least one cross-sex medical procedure or treatment regimen, namely, regular cross-sex hormone treatment or gender reassignment surgery confirming the desired gender (e.g., penectomy, vaginoplasty in natal male; mastectomy or phalloplasty in a natal female).

Other specified gender dysphoria

The “other specified gender dysphoria” category is used in situations in which the clinician chooses to communicate the specific reason that the presentation does not meet the criteria for gender dysphoria. This is done by recording “other specified gender dysphoria” followed by the specific reason (e.g., “brief” gender dysphoria).

Unspecified gender dysphoria

The “unspecified gender dysphoria” category is used in situations in which the clinician chooses not to specify the reason that the criteria are not met for gender dysphoria and includes presentations in which there is insufficient information to make a more specific diagnosis.

HELP????

HISTORY:

Patients with gender dysphoria (GD) usually present to their primary care physician, endocrinologist, or mental health provider.

A detailed and good history covering all aspects of social, familial and psychological history needs to be taken.

Social and developmental history includes their childhood, education status, academic performance, social support, history of trauma (mental, physical, sexual), legal history, and whether they are currently married or have children.

Family history includes any history of psychiatric illness, completed suicides, or substance use

Past psychiatric history if any, such as past suicide attempts, self injurious behaviour and/or history of previous psychiatric inpatient treatment.

EXAMINATION:

At birth, a thorough genital exam should be carried out to rule out ambigious genitalia.

Careful and meticulous assessment and genetic testing should be performed on individuals born with ambiguous genitalia

Children born with congenital adrenal hyperplasia or androgen insensitivity syndrome can present with ambiguous genitalia.

Congenital adrenal hyperplasia may present with early signs of dehydration, hyponatremia, and hyperkalemia.

In the late-onset subtype, they might present with early signs of virilization and menstrual irregularities in young females.

Classic salt-losing type individuals are sicker and need immediate management.

Androgen insensitivity syndrome is when genetic males are insensitive to androgens in the body and are often raised as girls. They usually present in adolescent age group with primary amenorrhoea.

LOOKING AT THE GUIDELINES:

Royal college of psychiatrists, UK (2013):

New guidelines for the assessment and treatment of gender dysphoria, which include the following:

1. Gender treatment should involve a multidisciplinary team.
2. People with gender dysphoria should have access to high-quality care without unnecessarily long waiting period.
3. People with gender dysphoria have a right to psychotherapy and counselling as part of their treatment.
4. Treatment should recognize the preferences, needs, and circumstances of the particular patient.
5. Treatments that have been initiated for adolescents should continue into adulthood without interruption.
6. More research should be encouraged, including research on patient outcome and satisfaction with interventions and transition. (5,6)

Standard of care (SOC) (World Professional Association for Transgender Health: (2012)

1. Primary care:

a. Transgender and gender diverse patients should receive non-judgmental care from appropriately trained health care professionals.

b. Gender-affirming primary care includes preventive care, mental health and substance use disorder screening, hormone therapy, and education about nonmedical/nonsurgical gender-affirming interventions.

2. Assessment of transgender and gender diverse persons:

a. When the adult patient desires gender-affirming medical and/or surgical treatment (GAMST) that aligns physical characteristics with gender identity, this care should be offered when there is a marked and sustained difference between sex assigned at birth and current gender; there is capacity for informed consent; physical and/or mental health conditions that may be affected by GAMST have been assessed; and reproductive implications and options have been discussed.

b. Children and adolescents require a multidisciplinary approach, which considers developmental stage, neurocognitive function, language skills; offers mental health support; discusses risks and benefits of social transition; and includes parental/guardian involvement in GAMST in almost all situations.

3. Mental health:

a. Any qualified health professional with the ability to identify gender incongruence may assess patients for GAMST.

No more than 1 letter of recommendation is required for GAMST in adults.

b. Psychotherapy is not required before GAMST, although therapy may be helpful for some.

c. Therapy to change gender identity or expression is associated with increased suicide risk and should not be offered to transgender and gender diverse patients.

4. Medication:

a. To improve psychosocial functioning and quality of life, clinicians should assess, and if appropriate, initiate and continue hormone therapy for eligible transgender and gender diverse people when it is required.

b. Eligible adolescent transgender and gender diverse patients may be offered hormone suppression after pubertal onset (Tanner stage 2) and menstrual suppression for eligible adolescents assigned female at birth, when testosterone is not yet indicated.

5. Surgery:

a. Clinicians should counsel transgender and gender diverse patients seeking surgical options about associated risks and benefits unless surgery is contraindicated.

b. Qualified surgeons should have training and continuing education in gender-affirming procedures and should track their surgical outcomes.

6. Education:

a. The health care workforce should receive transgender and gender diverse cultural awareness continuing education.

b. Health care training programs should include competencies in transgender and gender diverse health.

The SOC recommends against physical interventions before age 16.

They recommend that surgery only be performed after age 18 and after the individual has lived in their desired gender role for at least two years.

For people to undergo physical (hormonal or surgical) interventions to make their body more in line with their gender identity, they must be assessed by a mental health professional with special competence in this area, and often recommendations are required from two such mental health professionals. (7)

Endocrine Society (2017):

1. For the care of peripubertal youths and older adolescents, we recommend that an expert multidisciplinary team comprised of medical professionals and mental

health professionals manage this treatment.

2. The treating physician must confirm the criteria for treatment used by the referring mental health practitioner and collaborate with them in decisions about gender-affirming surgery in older adolescents.
3. For adult gender-dysphoric/gender-incongruent persons, the treating clinicians (collectively) should have expertise in transgender-specific diagnostic criteria, mental health, primary care, hormone treatment, and surgery, as needed by the patient. (8)

PLAN OF TREATMENT:

Table 1. Criteria for Gender-Affirming Hormone Therapy for Adults

1. Persistent, well-documented gender dysphoria/gender incongruence
2. The capacity to make a fully informed decision and to consent for treatment
3. The age of majority in a given country (if younger, follow the criteria for adolescents)
4. Mental health concerns, if present, must be reasonably well controlled

Reproduced from World Professional Association for Transgender Health (9).

TABLE 2. CRITERIA FOR GENDER-AFFIRMING HORMONE THERAPY FOR ADOLESCENTS

Adolescents are eligible for GnRH agonist treatment if:

1. A qualified MHP has confirmed that:
   - the adolescent has demonstrated a long-lasting and intense pattern of gender nonconformity or gender dysphoria (whether suppressed or expressed),
   - gender dysphoria worsened with the onset of puberty,
   - any coexisting psychological, medical, or social problems that could interfere with treatment (e.g., that may compromise treatment adherence) have been addressed, such that the adolescent's situation and functioning are stable enough to start treatment, the adolescent has sufficient mental capacity to give informed consent to this (reversible) treatment,
2. And the adolescent:
   - has been informed of the effects and side effects of treatment (including potential loss of fertility if the individual subsequently continues with sex hormone treatment) and options to preserve fertility,
   - has given informed consent and (particularly when the adolescent has not reached the age of legal medical consent, depending on applicable legislation) the parents or other caretakers or guardians have consented to the treatment and are involved in supporting the adolescent throughout the treatment process,

3. And a pediatric endocrinologist or other clinician experienced in pubertal assessment
   - » agrees with the indication for GnRH agonist treatment,
   - » has confirmed that puberty has started in the adolescent (Tanner stage $G2/B2),
   - » has confirmed that there are no medical contraindications to GnRH agonist treatment.

Table 3. Protocol Induction of Puberty

Induction of female puberty with oral 17b-estradiol, increasing the dose every 6 mo:

- 5 mg/kg/d
- 10 mg/kg/d
- 15 mg/kg/d
- 20 mg/kg/d

Adult dose = 2–6 mg/d

In postpubertal transgender female adolescents, the dose of 17b-estradiol can be increased more rapidly:

1. mg/d for 6 mo
2. mg/d

Induction of female puberty with transdermal 17b-estradiol, increasing the dose every 6 mo (new patch is placed every 3.5 d):

6.25–12.5 mg/24 h (cut 25-mg patch into quarters, then halves)

25 mg/24 h

37.5 mg/24 h

Adult dose: 50–200 mg/24 h

Induction of male puberty with

testosterone esters increasing the dose every 6 mo (IM or SC): 25 mg/m2/2 wk (or alternatively, half this dose weekly, or double the dose every 4 wk)

- 50 mg/m2/2 wk
- 75 mg/m2/2 wk
- 100 mg/m2/2 wk

Adult dose = 100–200 mg every 2 wk

In postpubertal transgender male adolescents the dose of testosterone esters can be increased more rapidly:

75 mg/2 wk for 6 mo

125 mg/2 wk

Table 4. Baseline and Follow-up Protocol During Induction of Puberty

Every 3–6 mo:

- Anthropometry: height, weight, sitting height, blood pressure, Tanner stages
- Every 6–12 mo:
    - » In transgender males: hemoglobin/hematocrit, lipids, testosterone, 25OH vitamin D In transgender females: prolactin, estradiol, 25OH vitamin D
- Every 1–2 y :
    - » BMD using DXA
    - » Bone age on X-ray of the left hand (if clinically indicated)
    - » BMD should be monitored into adulthood (until the age of 25–30 y or until peak bone mass has been reached).

Table 5. Medical Risks Associated With Sex Hormone Therapy

Transgender female: estrogen

Very high risk of adverse outcomes:

- Thromboembolic disease

Moderate risk of adverse outcomes:

- Macroprolactinoma
- Breast cancer
- Coronary artery disease
- Cerebrovascular disease
- Cholelithiasis
- Hypertriglyceridemia

Transgender male: testosterone

Very high risk of adverse outcomes:

- Erythrocytosis (hematocrit - 50%)

Moderate risk of adverse outcomes:

- Severe liver dysfunction (transaminases, threefold upper limit of normal)
- Coronary artery disease

- Cerebrovascular disease
- Hypertension
- Breast or uterine cancer

Table 6. Hormone Regimens in Transgender Persons

Transgender females	
Estrogen:	
Oral	
Estradiol	2.0–6.0 mg/d
Transdermal	
Estradiol transdermal patch	0.025–0.2 mg/d
(New patch placed every 3–5 d)	
Parenteral	5–30 mg IM every 2 wk
Estradiol valerate or cypionate	2–10 mg IM every week
Anti-androgens	
Spironolactone	100–300 mg/d
Cyproterone acetate	25–50 mg/d
GnRH agonist	3.75 mg SQ (SC) monthly
	11.25 mg SQ (SC) 3-monthly
Transgender males Testosterone:	
Parenteral testosterone	
Testosterone enanthate or cypionate per week	100–200 mg SQ (IM) every 2 wk or SQ (SC) 50%
Testosterone undecanoate	1000 mg every 12 wk
Transdermal testosterone	
Testosterone gel 1.6%	50–100 mg/d
Testosterone transdermal patch	2.5–7.5 mg/d

Table 7. Monitoring of Transgender Persons on Gender-Affirming Hormone Therapy: Transgender Male

1. Evaluate patient every 3 mo in the first year and then one to two times per year to monitor for appropriate signs of virilization and for development of adverse reactions.
2. Measure serum testosterone every 3 mo until levels are in the normal physiologic male range:a

3. For testosterone enanthate/cypionate injections, the testosterone level should be measured midway between injections. The target level is 400–700 ng/dL to 400 ng/dL. Alternatively, measure peak and trough levels to ensure levels remain in the normal male range.
4. For parenteral testosterone undecanoate, testosterone should be measured just before the following injection. If the level is
5. ,400 ng/dL, adjust dosing interval.
6. For transdermal testosterone, the testosterone level can be measured no sooner than after 1 wk of daily application (at least 2 h after application).
7. Measure hematocrit or hemoglobin at baseline and every 3 mo for the first year and then one to two times a year. Monitor weight, blood pressure, and lipids at regular intervals.
8. Screening for osteoporosis should be conducted in those who stop testosterone treatment, are not compliant with hormone therapy, or who develop risks for bone loss.
9. If cervical tissue is present, monitoring as recommended by the American College of Obstetricians and Gynecologists.
10. Ovariectomy can be considered after completion of hormone transition.
11. Conduct sub- and periareolar annual breast examinations if mastectomy performed. If mastectomy is not performed, then consider mammograms as recommended by the American Cancer Society.

Table 8. Monitoring of Transgender Persons on Gender-Affirming Hormone Therapy: Transgender Female

1. Evaluate patient every 3 mo in the first year and then one to two times per year to monitor for appropriate signs of feminization and for development of adverse reactions.
2. Measure serum testosterone and estradiol every 3 mo.
3. Serum testosterone levels should be ,50 ng/dL.
4. Serum estradiol should not exceed the peak physiologic range: 100–200 pg/mL.
5. For individuals on spironolactone, serum electrolytes, particularly potassium, should be monitored every 3 mo in the first year and annually thereafter.
6. Routine cancer screening is recommended, as in non transgender individuals (all tissues present).
7. Consider BMD testing at baseline (160). In individuals at low risk, screening for osteoporosis should be conducted at age 60 years or in those who are not compliant with hormone therapy.

Table 9. Criteria for Gender-Affirming Surgery, Which Affects Fertility

1. Persistent, well-documented gender dysphoria

2. Legal age of majority in the given country
3. Having continuously and responsibly used gender-affirming hormones for 12 mo (if there is no medical contraindication to receiving such therapy)
4. Successful continuous full-time living in the new gender role for 12 mo
5. If significant medical or mental health concerns are present, they must be well controlled.
6. Demonstrable knowledge of all practical aspects of surgery (e.g., cost, required lengths of hospitalizations, likely complications, postsurgical rehabilitation)

FERTILITY PRESERVATION:

About 47% of transgender individuals would like to have a child to whom they are genetically related.

As hormonal therapy adversely affects fertility, and surgery may include gonadal removal it is advisable to counsel the patient for fertility preservation prior to gender affirmation therapy.

Transwomen:

Options are: Semen cryopreservation with specimen obtained from masturbation or penile vibratory stimulation.

In case patient is not able to give sample specimen can be obtained by electro stimulation or by surgical sperm retrieval techniques.

The obtained sperm can be used to fertilize the partner of the transwoman if this partner is female.

In case of a male partner a gestational surrogate is needed for fertilization.

Transmen:

For transmen fertility options are embryo cryopreservation, oocyte cryopreservation, and ovarian tissue cryopreservation.

As long as the ovaries and uterus are in situ, it is also possible for a transgender man to become pregnant spontaneously.

Since testosterone therapy may be dangerous for fetal development it is important that testosterone therapy be discontinued before the transman becomes pregnant.

When a transgender man does not want to carry the child, a gestational surrogate is also needed.

However, surrogacy for transgender individuals is still not widely available due to ethical and legal issues. (10,11)

Conclusion:

The transgender population was always prevalent, it's just that the society has started to recognise them now.

It is a challenging, multidisciplinary, and developing field in medicine.

The physician needs to discuss the pros and cons of the several treatment options for the transgender individual for them to make an well informed decision.

Proper psychological support should be provided to the individual and their families.

As Knowledge is wealth it's the duty of the primary caregiver to be upto date about treatment protocols and new policies.

REFERENCES:

1. Daniolos PT. Identity, Conformity, and Nonconformity: A Closer Look. J Am Acad Child Adolesc Psychiatry. 2018 Jul;57(7):460-461.
2. Saleem F, Rizvi SW. Transgender Associations and Possible Etiology: A Literature Review. Cureus. 2017 Dec 24;9(12):e1984.
3. van der Miesen AIR, Hurley H, Bal AM, de Vries ALC. Prevalence of the Wish to be of the Opposite Gender in Adolescents and Adults with Autism Spectrum Disorder. Arch Sex Behav. 2018 Nov;47(8):2307-2317.
4. Pasterski V, Gilligan L, Curtis R. Traits of autism spectrum disorders in adults with gender dysphoria. Arch Sex Behav. 2014 Feb;43(2):387-93.
5. Royal College of Psychiatrists. Good practice guidelines for the assessment and treatment of adults with gender dysphoria. London: Royal College of Psychiatrists; 2013. p. 11–53 [http://www.rcpsych.ac.uk/files/pdfversion/CR181_Nov15 Cassels C. New treatment guidelines for gender dysphoria released. Medscape Medical News. October 24, 2013.
6. Royal College of Psychiatrists. Good practice guidelines for the assessment and treatment of adults with gender dysphoria. Available at http://www.rcpsych.ac.uk/usefulresources/publications/collegereports/cr/cr181.aspx. Accessed: October 28, 2013.
7. Standards of Care for Transgender and Gender Diverse People Tonia Poteat, PhD, PA-C, MPH; Andrew M. Davis, MD, MPH; Alex Gonzalez, MD, MPH JAMA Clinical Guidelines Synopsis 2012
8. Hembree et al Guidelines on Gender-Dysphoric/Gender-Incongruent Persons J Clin Endocrinol Metab, November 2017, 102(11):3869–3903
9. World Professional Association for Transgender Health. Stan- dards of care for the health of transsexual, transgender, and gender nonconforming people. Available at: http://www.wpath. org/site_page.cfm?pk_association_webpage_menu51351&pk_association_webpage53926. Accessed 1 September 2017
10. Tornello SL, Bos H. Parenting Intentions Among Transgender Individuals. LGBT Heal. 2017;4:115–120
11. Mattawanon N, Spencer JB, Schirmer DA, Tangpricha V. Fertility preservation options in transgender people: A review. Rev. Endocr. Metab. Disord. 2018;19:231–242.

Thankyou