Volume 23, April 2024, Issue 11

AOGD BULLETIN

Holistic Approach to Women's Health

AOGD 2023

Mixed Bag

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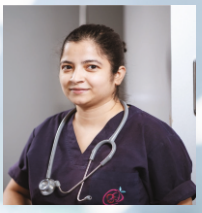

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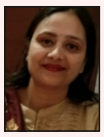

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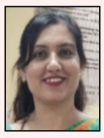

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From the AOGD Office


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Dear Friends

It is time to bid adieu for another year, and we thank all our members and well-wishers who made this possible. Our successful tenure wouldn't have been possible without the tireless efforts of Team AOGD at GTB Hospital. It is the patrons Dr. SN Mukherjee, Dr. Urmil Sharma, Dr. Kamal Buckshee & Dr. Neera Agarwal that have paved the way for AOGD's growth and we are grateful for their unwavering support.

We are grateful to our valued advisors Dr. Swaraj Batra, Dr. Sharda Jain & Alka Kripalani who are always available. AOGD misses, this year, its senior member Dr Indrani Ganguly. May she rest in peace.

Congratulations to Dr. Ashok Kumar on assuming the role of President of AOGD for 2024-25 at a small but symbolic ceremony at GTB Hospital on 27th March 2024. Best wishes to him and his team for success during his tenure and for AOGD to achieve great things.

A special thanks to all chairpersons and members of the AOGD subcommittees who organized the very popular webinars and meetings. Our sincere appreciation goes out to our outgoing Subcommittee Chairpersons, Dr Mrinalini Mani, Dr Manju Khemani, Dr Shivan Agarwal and Dr Kiran Guleria for a very successful term in office. We congratulate the incoming Chairpersons of four committees– Dr. Pikee Saxena, Infertility & Reproductive endocrinology Committee, Dr. Seema Prakash, Breast and Cervical Cancer Awareness, Screening and Prevention committee, Dr. Deepa Gupta, Community Health and Public Awareness committee, Dr Shashi Kabra, Safe Motherhood committee. Good luck with your tenure and success. The newly formed Medico legal committee is chaired by Dr Nidhi Khera. We extend a warm welcome to her.

The last issue of the AOGD bulletin focuses on "Mixed Bag" and includes coverage on artificial intelligence in ART and audit of cesarean sections, as well as updates on the latest developments and practices in Obstetrics and Gynecology. A good read is the write-up on Health, Harmony and Happiness.

Cheers and thank you once again for allowing us to serve you in the year 2023-24

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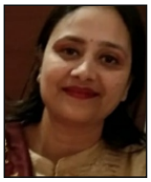

Dr Anupama

Co-Editor

Respected seniors and dear friends

Greetings to all!

We delightfully release the last issue of AOGD bulletin which is a mixed bag of topics which could not be covered in previous issues. The issue contains interesting topics like algorithmic approach on management of gestational trophoblastic neoplasia and hypothyroidism in pregnancy. A discussion on role of platelet rich plasma in gynecology is part of emerging regenerative medicine, a lucid discussion on the role of artificial intelligence in ART and maternal vaccination is covered. There is a comprehensive article on cesarean audit, along with holistic approach to mental health issues in pregnancy and postpartum.

Before we bid adieu we extend our gratitude to all our esteemed writers for their invaluable contribution and readers for their continuous encouragement and appreciation throughout our journey. Our best wishes the new team of AOGD at ABVIMS and RML Hospital.

"With pens in hand and mind so bright, you step into this role with all your might.

To the new editorial team we send our cheer, may your pages be filled with success all year"

Wishing you all happy reading

Editorial team
(AOGD 2023-2024)

Hypothyroidism in pregnancy: Management guidelines

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Introduction

Thyroid disorder in pregnancy is the second most common endocrine disorder after Diabetes mellitus[1].

Globally, the prevalence of hypothyroidism during pregnancy is reported to be 1.5%–4%, out of which only 0.3%–0.5% had overt (symptomatic, high TSH, Low T3 & T4) and the remaining had sub clinical hypothyroidism (asymptomatic, high TSH, normal T3,T4). The prevalence of maternal hypothyroidism in Indian pregnant women ranged between 1.2% and 67.0%.[1] This suggest that Hypothyroidism during pregnancy is highly prevalent in India and other Asian countries.

The leading cause of hypothyroidism in pregnancy is iodine deficiency, and the most common cause of hypothyroidism during pregnancy is autoimmune thyroiditis in iodine sufficient areas. Infact, thyroid peroxidase (TPO) antibodies (TPOAbs) or thyroglobulin antibodies are also positive in up to 18% of all pregnant women in India.[2]

Risk factors for hypothyroidism during pregnancy includes, people residing in endemic belt (India) H/o thyroid dysfunction , known thyroid antibody positivity or presence of a goiter, H/o head or neck radiation or prior thyroid surgery, Type 1 diabetes or other autoimmune disorders , H/o pregnancy loss, preterm delivery, or infertility, family h/o autoimmune thyroid disease or thyroid dysfunction

Hypothyroidism during pregnancy is associated with miscarriage, preterm delivery, infertility, postpartum thyroiditis (PPT), placental abruption, and premature rupture of membranes, as well as adverse neonatal outcomes such as affected motor and neuropsychological development, attention deficit disorders, low brain to body mass ratio, and reduced brain weight.

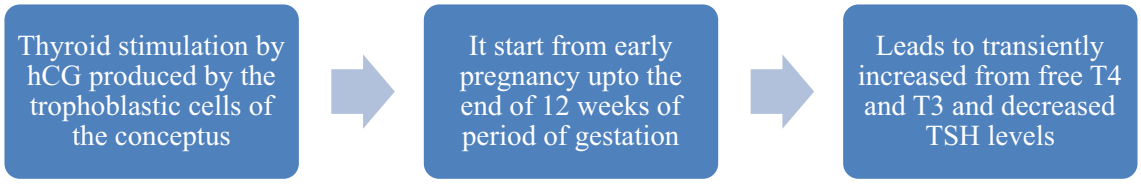
Therefore, management guidelines for hypothyroid during pregnancy are to be discussed for clinical decision making in managing thyroid disorders in pregnant and postpartum women.

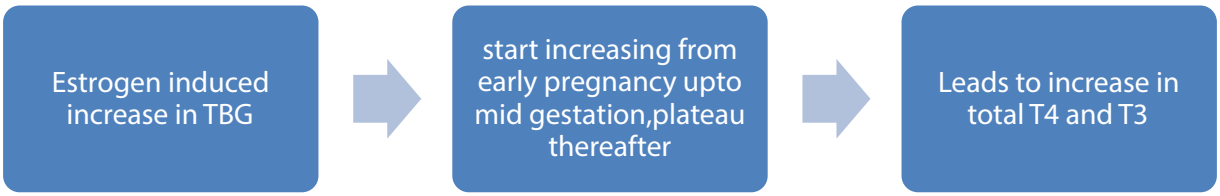
Physiological changes during pregnancy

Effect of B-HCG on maternal thyroid function:-

The thyroid undergoes physiological changes during pregnancy which include the enlargement of the gland and increased vascularization. During pregnancy, the thyroid gland increases in size by 10% in iodine sufficient countries but by 20% to 40% in areas of iodine deficient areas.

b-HCG causes thyroid stimulation starting from the first trimester, due to structural analogy with thyroid-stimulating hormone (TSH), the concentration of b-HCG Peaks in the first 8 to 11 weeks of pregnancy, decreases thereafter, and remains in plateau up to pregnancy till term leading to a decrease in serum TSH in the first trimester so pregnant women have lower serum TSH concentrations than non-pregnant women. In twin pregnancies, b-HCG elevations are particularly pronounced and are responsible for increased thyroidal stimulation, leading more frequently to increased free T4 and suppressed





TSH levels. Maternal T4 is transferred to the fetus throughout the entire pregnancy and is important for normal fetal brain development especially before 12 weeks of gestation.[3]

Under the effect of high concentrations of circulating estrogens, serum TBG start to increase a few weeks after conception and reaches a plateau during mid gestation .The raised level of Serum TBG is due to increase TBG production rate by hepatocytes and a reduced clearance of the protein from plasma.[3]

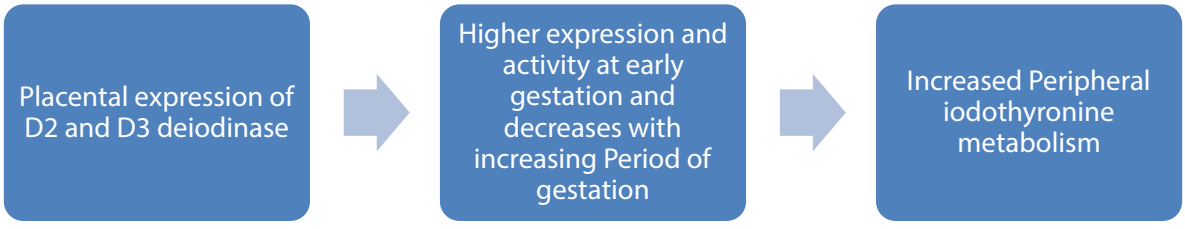
Modifications in the Peripheral Metabolism of Thyroid Hormones

The predominant iodothyronine deiodinase expressed in human placenta is D3, which catalyzes T4 to generate reverse T3 (rT3) and T3 to T2. The human placenta also expresses D2, which catalyzes T4 to generate T3. Placental D3 activity is an important source of iodine which delivered to the fetus for the production of thyroid hormones by the fetal gland. D2 is considered important in early stages of gestation , leading to adequate intraplacental levels of T3 required for trophoblast development and differentiation. Overall, the increased degradation of the iodothyronines by placental deiodinases contributes, to the increase in hormone demand.[3]

Iodine requirement during pregnancy

Iodine requirement increases during pregnancy due to increasing maternal T_4 production and Increased renal iodine clearance.

The current salt iodization done as per Indian guidelines (15 ppm of iodine at the consumer level) is designed to deliver 150 µg of iodine per day and this appears to be inadequate for pregnant women, whose dietary iodine requirement is 250 µg/day according to the WHO. Therefore, to cover this increased iodine demand of 250 µg/day during the pregnancy,



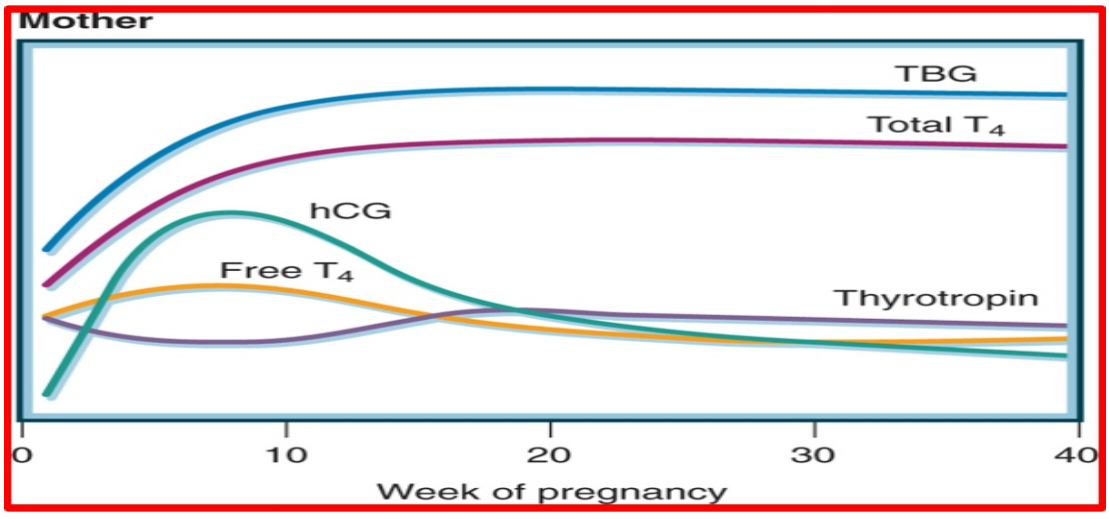


Figure 1: Changes in Thyroid Physiology during Pregnancy

the iodine content of salt needs to be higher. However, no iodine supplementations are recommended during pregnancy.[4]

Diagnosis of thyroid disorder

The guidelines of American thyroid association (ATA) for the diagnosis and the management of thyroid disease during pregnancy and postpartum recommended population based trimester specific reference ranges. In absence of normal ranges ATA 2017 guidelines suggest[1]

1. Week 7 to 11 reduce the lower limit of reference range of TSH by approximately 0.4 mU/l and upper limit by 0.5mU/l that is 0.1 to 4 mU/l
2. Second and third trimester there should be gradual return of TSH towards the non pregnant normal range
3. The upper reference range for total T4 increase by approximately 5% per week beginning at week 7. At 16 weeks approximately 1.5 fold higher than in non pregnant women.

According to consensus statement of Indian thyroid society[5]

- The TSH reference range should be trimester specific and dependent on the iodine sufficient population and free from underlying thyroid disorders population.
- In the case of non availability of locally derived reference ranges, an upper reference limit of ~4.0 mU/L may be used.

According to Indian thyroid society, If the TSH concentration is more than the pregnancy reference range, T4 level measurement is recommended to confirm the diagnosis. In the case of non-availability of reliable FT4 assay, total T4 multiplied by 1.5 can be used. The ATA 2017 guideline suggested that total T4 (TT4) measurement (with a pregnancy-adjusted reference range) is a more reliable means of estimating hormone concentration during pregnancy as the accuracy of serum free T4 (FT4) measurement is influenced by pregnancy and also varies significantly by manufacturer. If measured in pregnant women, assay method-specific and trimester-specific pregnancy reference ranges should be applied.

Using the trimester specific TSH cutoffs as 1st,2nd and 3rd trimesters, (as per older American Thyroid Association's [ATA] guidelines, now considered obsolete), 44.3%, 32.0%, and 34% of women were found to have hypothyroidism during pregnancy respectively. Whereas with the use of a cutoff TSH level of 4.5 mIU/L, 13.13% of pregnant women were observed to have hypothyroidism.

Thyroid peroxidase antibodies and pregnancy complications :-

Women who are positive for TPOAb are associated with an increased risk of developing hypothyroidism during pregnancy and adverse obstetric outcomes. Estimates have shown that 18.9% of Indian pregnant women were detected as being TPOAb positive with euthyroid status. In women with known Thyroid autoantibodies , the TSH concentrations should be assessed every 4 weeks through to mid-pregnancy.

Pregnant women with a known level of anti TPOAb (levels of more than 34 IU defined as a positive test), and TSH levels of 2.5–3.9mIU/L in the 1st trimester and 3–4.1mIU/L in the 2nd and 3rd trimesters, may be associated with pregnancy related complications

Screening of Thyroid disorder during pregnancy

According to the Indian Thyroid Society Consensus Statement 2021, Universal screening for hypothyroidism for all antenatal women, especially in the first trimester, should be preferred over targeted case-based screening, various studies conducted all over India suggest that case-based screening can miss significant

Table 1: Trimester wise range of TSH,T3 and T4.

Test	First trimester	Second trimester	Third trimester
Free T_4 (pmol/L)	10-24	9-19	7-17
Free T_3 (pmol/L)	4-8	4-7	3-5
TSH (mu/L)	0.1-2.5	0.2-3	0.3-3

number of pregnant women with Subclinical Hypothyroidism, and overt Hypothyroidism. A systematic review and meta-analysis showed that case-based screening missed up to 49% of pregnant women with thyroid dysfunction[7]. Case-based screening can also miss women with positive Anti TPO antibodies with otherwise normal TFTs. These patients are at higher risk of hypothyroidism and postpartum thyroiditis.

The establishment of trimester-specific reference range in each region is very crucial, as this cannot be extrapolated due to differences in ethnicity, maternal iodine status, laboratory assay methods. Therefore, The TSH reference range should be pregnancy and trimester-specific.

Treatment during pregnancy

LT4(levothyroxine) is the treatment of choice for subclinical hypothyroidism. The Adjustment of the dose of LT4 during pregnancy is important to normalize thyroid function, reduce the occurrence of complications, and achieve satisfactory pregnancy outcomes.

Initiation of LT4 therapy in the 1st trimester was associated with a decreased risk of adverse obstetric events (preterm births, pregnancy loss, low birth weight, postpartum hemorrhage, preeclampsia, and gestational diabetes). LT4 treatment for TPOAb-positive euthyroid pregnant women with a prior history of loss may be considered on an individual case-to-case basis given its potential benefits and for this condition typical starting dose is 25–50 µg of LT4 [4]

Dosage of levothyroxine during pregnancy

The Dosage of LT4 during pregnancy varies ,the European Thyroid Association (ETA) proposes a starting dose of Levothyroxine as 1.20 µg/kg/day in newly diagnosed patients with Subclinical hypothyroid during pregnancy. The American Thyroid Association (ATA) suggests a starting dose of 50µg/d LT4 for the effective treatment of SCH women during pregnancy. According to the National Indian Patient-centered Thyroid Management group, the dose of thyroxine can be increased from 7 to 9 tablets a week after pregnancy is confirmed. Therefore, all pregnant women already taking LT4 should increase the dosage by 25%–30%.

The administration of LT4 to TPOAb positive euthyroid women undergoing assisted reproductive technology with ovulatory dysfunction may be initiated in dose of 25–50µg of LT4 for better outcome .[4]

Treatment—Postnatal

In the postpartum period, the LT4 dose should be reduced to the patient's preconception dose. Additional thyroid function testing should be performed at approximately 6 weeks postpartum. In some women, if LT4 is initiated during pregnancy, they may not require LT4 post-delivery. Hence, LT4 can be discontinued in such women, especially when the LT4 dose is $\leq$50 µg/d. If LT4 is discontinued, serum TSH should be evaluated in approximately 6 weeks.[2] Alternatively, the LT4 dose should be reduced by 50% with the measurement of thyroid function tests at 6 weeks. If women remain euthyroid even on this reduced dose, then a trial of stopping LT4 can be taken.[5]

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Role of artificial intelligence in ART

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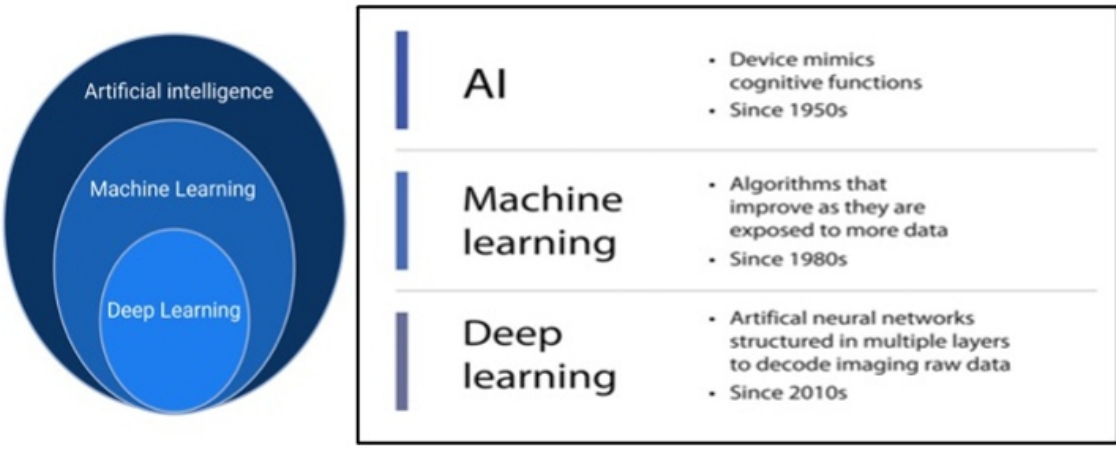
Definition

Development of computer algorithms to perform tasks associated with human intelligence is called artificial intelligence (AI). AI can predict & determine what the best "next steps" should be in order to achieve a particular target. AI in healthcare involves acquisition & analysis of medical information at point of care using machine algorithms to provide real-time decision- making by functioning besides physician.

History of AI dates back to > 80 years from theory laid by Alan Turing, Warren McCulloch & Walter Pitts. Figure 1 describes the history of AI.

Applications in ART

- AI aids gamete donation & cryopreservation; decreases embryo wastage, especially in countries with constraining ART laws.
- AI-based oocyte selection helps to identify oocytes with greatest developmental potential and capable of fertilizing. This raises efficiency of IVF process & decreases production of incompetent, nonviable, or chromosomally abnormal embryos that will never be used thereby reducing storage requirements for cryopreserved oocytes & embryos



Machine learning (ML) and deep learning (DL) are two sub-types of AI with different qualities & characteristics (table 1) .

Table 1: Sub-types and characteristics of AI

Machine learning	Deep learning
Supervised machine learning: learning by example; Computer is fed with data-set containing labels that act as answers. Over time it learns to differentiate between those labels to provide correct outcome. **Unsupervised machine learning:** learning by observation. AI recognizes & identifies patterns & learns how to distinguish patterns on its own.	A form of AI that bears resemblance to human-based learning. It recognize patterns in complex data sets to transform the way we practice medicine. AI gathers information via text, audio, video, images & 3D models. • **Neuron** is a mathematical function that depicts a learning unit. • **Deep learning neural network (DNN)** has digitized inputs (image or speech) that advance via different layers of linked "neurons" that ultimately detect features & provide an output.

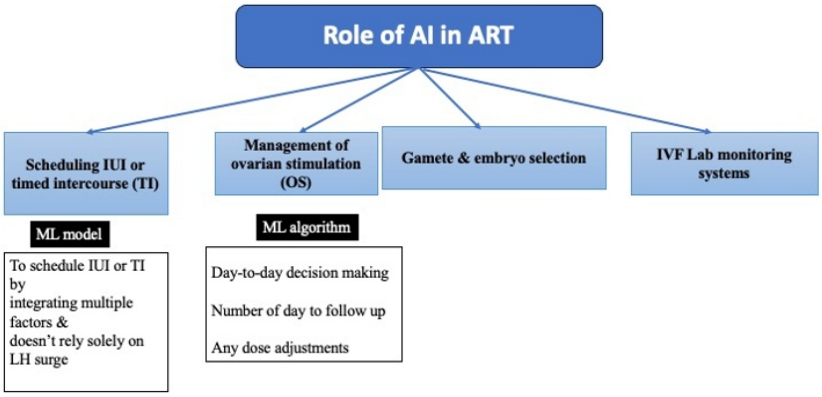


Figure 2: describes the overview of AI based applications in different fields of ART.

Table 2: AI in oocyte selection

Feature	Parameter and method used
Oocyte quality	Assessed noninvasively by visual inspection of cumulus– oocyte complex, cytoplasm, vacuoles, zona pellucida, perivitelline space & polar bodies to predict pregnancy
Oocyte image segmentation	• DL system used for segmentation of low-resolution images of metaphase II (MII) oocytes • Different parts of oocyte are segmented (identified & highlighted) using convolutional neural network (CNN) that took oocyte images as input & provided segmentation maps. Measurements from segmentation maps are then fed into support vector machine model that predict oocyte's developmental potential

Figure 3

- The key variable for successful IVF cycle may be still undiscovered to science but may be discovered by AI models (Known as computational embryology)

AI in different ART components

Table 2 describes the AI based tools used for oocyte selection depending upon different oocyte features

I. AI in oocyte selection

- As shown in figure 3, VIOLET™ and MAGENTA™ tools are used for predicting live birth from oocyte freezing cycles and blastulation capacity respectively. These scores are made on the basis of non-invasive AI based static mature oocyte image analysis.

II. Role of AI in sperm selection- Table 3 describes different AI based applications being used for good quality sperm selection.

Advantages of AI in sperm selection are less time consumption and it prevents subjectivity & variability in manual assessment

III. Role of AI in embryo selection

- Embryo selection by AI involves DL analysis of both static & time-lapse images, clinical

Table 3 : AI in sperm selection

AI type	Sperm characteristics assessed
Smartphone-based semen analysis systems	More popular & enables at-home testing
Morphological analysis	CNN algorithm used to assess **morphological deformities** in head, acrosome, neck & tail
Motility analysis	DL methods are used to improve accuracy achieved by computer-assisted motility analysis
Image segmentation	Automatic segmentation of head, acrosome, nucleus, axial filament, mid-piece & tail from microscopic images of human semen smears & reproductive outcomes predicted
DNA integrity prediction	Selection of sperm with high **DNA integrity** solely from imaging data by training a CNN with sperm images labelled with different DNA fragmentation indices Automated smartphone-based system used for measuring sperm viability, **DNA fragmentation & hyaluronic binding assay score**
Sperm selection	DL model using YOLOv3 supports **sperm selection for ICSI** by morphologically assessing sperm in real time; Computer vision system to select individual sperm for ICSI on basis of kinematic data (straight-line velocity, linearity of curvilinear path & head movement pattern).
Clinical outcome prediction	ML algorithm measures **capacitated sperm intracellular pH** which correlates with IVF success

Table 4: AI in embryo selection

Embryo grading	• Used to grade **D3 cleavage-stage embryos** into four types based on blastomere size equality & fragmentation severity with 74.1% accuracy • **Grading of D5 blastocysts** as good or poor.
Image enhancement	Multiple focal planes are fused into single image without loss of useful information
Image segmentation of the embryo	DL is used to segment zona pellucida, trophectoderm, inner cell mass & blastocoel in images of blastocysts. Once segmented, each structure can be assessed individually to take measurements or to determine quality grades. These images are pre-processed & enhanced before they are used as input into models
Ploidy prediction	**ERICA (Embryo ranking intelligent classification algorithm) -** to grade blastocysts successfully based on its ability to predict ploidy & pregnancy results. It is more successful than random selection in identifying blastocysts with greatest potential on basis of observing one static image. ERICA has the potential to assist embryologists in embryo selection without absolute need for time-lapse incubators or invasive PGT-a
Image generation	**HEMIGEN (Human embryo image generator based on generative adversarial networks)** is used to manipulate size, position & number of artificially generated embryo images; these images can then be used to train & validate other embryo image processing algorithms, when real embryo images are not available, or number of available real embryo images is too small for training neural networks
Pronuclei detection	Automated DL technique detects pronuclei in fertilized oocytes on time-lapse embryo images
Blastocyst formation prediction	Commercially available & FDA-approved **Known implantation data on day 3 (KIDScoreD3)** is a decision tree algorithm to predict blastocyst formation & blastocyst quality from morphokinetic markers during cleavage stage
Pregnancy prediction	AI model is used for prediction of pregnancy from images of blastocyst. • CNN (convolution neural network) models can foretell fetal cardiac activity from D5 blastocyst snapshot of light microscope with 64.3% accuracy • **Life whisperer AI model** is used to predict embryo viability as measured by clinical pregnancy outcome using single static images of D5 blastocysts from optical light microscopy • Embryo selection based on **KS5 (KidScore D5)** algorithm score (morphokinetic prediction model) improved implantation rates of single euploid blastocyst transfers. Embryos with highest KS5 score had higher probability of being euploid & implanting • **iDA Score v1.0 & iDA Score v2.0 software (Intelligent Data Analysis Score)** provides fully automated analysis of time-lapse sequences from time of insemination (t0) until blastocyst stage development (108–148 h post-insemination). A higher score indicates a greater chance of achieving fetal heartbeat. A score from 1 (lowest) to 9.9 (highest) is automatically generated for each embryo which is statistically correlated with its implantation potential
Live birth prediction	• CNN model is used to predict live birth outcome from single blastocyst transfer using image data from more than 10,000 embryos • Multilayer perceptron evaluates **proteomic profiles of spent culture media & blastocyst morphology** to forecast live birth with 72.7% accuracy
Optimal transfer policy prediction	• XGBoost algorithm integrates patient demographics with D3 embryo classification of embryologist to offer personalised embryo transfer (Single/double ET along with particular embryos to transfer) to enhance pregnancy rate within a given probability of twin pregnancy & accomplished an AUC of 0.72 to predict twin pregnancy

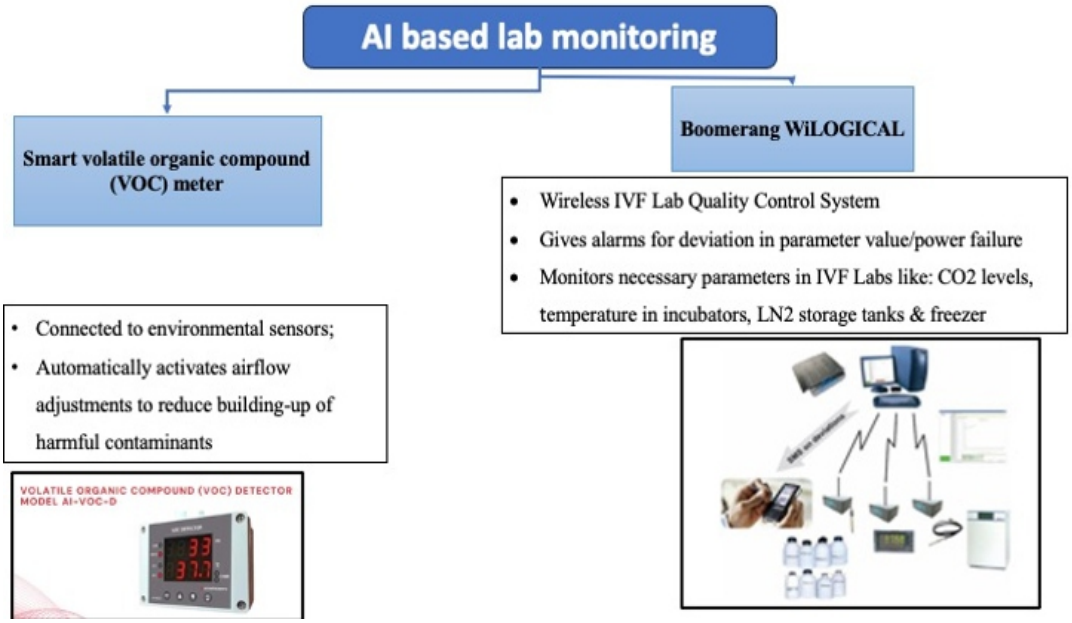


Figure 4

Table 5: Describes the challenges and solutions for different problems in IVF.

Challenges in AI	Different ways to overcome the challenges
Lack of data • Paucity of data to build AI systems due to data protection & privacy • Huge amount of labour is needed to annotate datasets by embryologists, labelled datasets are small & has missing labels	• **Differential privacy** allows data to be analysed without revealing sensitive information about individual in dataset • **Federated/ collaborative learning** – a sub-field of ML that allows AI systems to be trained across multiple devices without relocating each device's database to centralised server.
Noisy labels • Observed labels are classified incorrectly & variably by different embryologist which can lead to different scoring for same type of image • Noisy labels due to biological processes. Example: Difficulty of crediting singleton pregnancy after double embryo transfer to particular embryo	• CNN models are used to create **pseudo-labels** so that embryos with comparable developmental patterns were given same label. This allows identification of viable embryos even if they failed to implant due to maternal factors
• **Domain adaptation** (Capacity of AI systems to be robust across various clinics) is difficult for DL models due to differences in imaging set-ups (lighting, imaging equipment) • AI models created from datasets from single clinics can only perform well for particular clinic's patient demographics	• Overcome by data collection from multiple clinics, data normalization & data augmentation (training models with slightly modified duplicate of images in original data set) • **Adversarial learning** where AI models are trained to ignore artefacts specific to particular imaging set-up. This allows CNN trained on one image modality (e.g. HMC microscopy) to adapt to another (e.g. smartphone-based imaging system)
• AI systems can be a **blackbox** (provides very little biologically sound explanation as to how decisions are made); For example, when a blastocyst ranking tool advocates that a poor-quality blastocyst be prioritized over a good-quality blastocyst, embryologist may struggle to follow AI model blindly without explanation leading to untrustworthiness of AI tools	• AI tools should provide biological explanation for frictionless integration into clinical decision-making process . For example, despite first blastocyst's poor morphology, second blastocyst had morphokinetics outside normal range & direct cell division from one to three cells. These information may otherwise be missed by embryologist had they not been using an AI tool to support embryo selection • This is overcome by CNN based AI models that predicts pregnancy from images of blastocyst accompanied by **heatmaps** over it to identify parts of image deemed to be important

information, morphokinetic annotations & proteomic profile.

- Embryo selection centralise on assessment of time-lapse video obtained on incubators like EmbryoScope, Geri & MIRI. Benefit of employing these incubation systems is that they provide high degree of standardization in imaging set-ups between clinics

Disadvantages of Time-lapse imaging

- Unsupervised photography: variable lights, substandard focus & artefacts such as bubbles intervening some or all frames.

- If embryo is at the edge of the dish, it may sometimes only be partly from camera's point of view.
- Cost

AI based lab monitoring system: Smart IVF labs are equipped with incubators with remote sensors tracking carbon dioxide, pH & temperature, streamed to a cloud-based app monitoring all quality control procedures. Figure 4 describes the two most commonly used lab monitoring systems in clinical practice.

As there is need to standardise the AI based models and algorithms in IVF and there is still lack of world-wide uniformity in formulating various models. Lot is being done to solve these challenges to have uniform standardisation of AI in IVF. Table 5 describes the challenges and solutions for different problems in IVF.

Future of AI

- Due to large data-sets from more open database & federated learning, AI may give insights at a speed & scale that RCT have failed to provide
- AI will shift the way embryology is practiced from technical, hands-on processes towards intellectual processes requiring different skill set for next generation of embryologists

Suggested readings:

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ALGORITHM

Management of Gestational Trobhoblastic Neoplasia: Algorithm

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Gestational trophoblastic disease (GTD) is a group of disorder derived from a pregnancy event due to abnormal proliferation of placental villous and extra-villous trobhoblast. This term covers hydatidiform mole (both partial and complete mole), invasive mole, choriocarcinoma, placental site trophoblastic tumor (PSTT), and epithelioid trophoblastic tumor (ETT).

The term Gestational trophoblastic neoplasia (GTN) includes the malignant forms: invasive mole, choriocarcinoma, PSTT and ETT; thus, requires chemotherapy.

The incidence of GTD is 1:200-1000 pregnancies. Due to ethnic variation, Asian women have a higher risk as compared to non-Asian women (1/390 and 1/750 respectively). Both, women younger than 15 and older than 45 years have higher chances of GTN.

Clinical Presentation, Investigations and Diagnosis

1. GTN presents with vaginal bleeding and elevated hCG levels following:
   - molar gestation,
   - abortion,
   - tubal pregnancy,
   - term or pre-term gestation (immediately or months or even years after the antecedent pregnancy).
2. Bleeding in metastatic sites such as the liver, spleen, intestine, lungs, brain or spine.

All patients with suspicion of GTN should undergo thorough evaluation. This includes:

1. Full clinical history: antecedent and all pregnancies, LMP date, evacuation date, oral contraceptive intake
2. Clinical examination for metastatic disease, pelvic exam
3. Chest X-ray
4. Tumor HCG assay test as a new baseline

In September2000, International Federation of Gynecology and Obstetrics (FIGO) agreed for criteria to diagnose GTN (Box1):

Box 1: Criteria for the diagnosis of post hydatidiform mole trophoblastic neoplasia (GTN)

1. GTN may be diagnosed* when the plateau of human chorionic gonadatrophin (hCG) lasts for 4 measurements over a period of 3 weeks or longer, that is days 1,7,14,21.
2. GTN may be diagnosed* when there is a rise of hCG on three consecutive weekly measurements, over a period of two weeks or longer, days 1,7,14.
3. GTN is diagnosed if there is histologic diagnosis of choriocarcinoma.

NOTE: "persistence of β-hCG level for more than 6 months" has been removed as a criterion in 2013

Staging and Scoring of Gestational Trobhoblastic Neoplasia

Women diagnosed with GTN should undergo a series of investigations (Box 2) and then should be staged and assign a proper score according to current FIGO staging (Table 1) and modified WHO prognostic scoring system (Table 2).

Box 2: Tools for investigation of gestational trophoblastic neoplasia

1. Chest X-ray (diagnose lung metastases and to count the number of lung metastasis).

Lung CT may not be used in the risk score.

2. Liver metastases may be diagnosed by ultrasound or CT scanning.
3. Brain metastases may be diagnosed by MRI or CT scanning.

This scoring determines the course of treatment for the patient. The score has been developed

Table 1: FIGO Stage and Classification For Gestational Trophoblastic Neoplasia

FIGO Stage	Description
Stage I	Tumor Confined to Uterus
Stage II	Tumor to other genital structures (ovary, tube, vagina, broad ligaments) by direct extension or by metastasis
Stage III	Lung Metastasis
Stage IV	Metastasis to distant sites

from individual risk factors that are predictive of GTN being resistant to single agent chemotherapy. This predictive scoring system is not valid for PSTT and ETT. Low risk GTN the score is less than 7 and high risk is more than or equal to 7. Ultra high risk GTN is a score of 13 or more.

Treatment

Low-risk GTN

- Women with low-risk GTN should be treated with single agent methotrexates or actinomycin D protocols (Box 3).
- The Cochrane Review (2016) for 667patients across 7 randomized controlled trials, revealed that actinomycin D has higher primary cure rate (risk ratio [RR] 0.65; 95% CI, 0.57"0.75) than methotrexate.
- If after an initial response, hCG level plateaus or rises during treatment, or if toxicity precludes an adequate dose or frequency of treatment: Chemotherapy should be changed to the alternative single agent.
- Both choriocarcinoma and a higher WHO risk score of 5–6 are associated with an increased risk of resistance to single agent chemotherapy; thus, multi-agent chemotherapy can be considered for these women.
- After the hCG level has returned to normal, NCCN recommends a consolidation with 2-3 more cycles of chemotherapy after hCG levels return to normal to decrease the chance of recurrence. The overall complete remission rate is close to 100%.

Box 3: First-line single agent chemotherapy regimens for low-risk gestational trophoblastic neoplasia

- MTX-FA 8-day regimen (50 mg MTX intramuscularly on days 1, 3, 5, 7 with folinic acid 15 mg orally 24 h after MTX on days 2, 4, 6, 8); repeat every 2 weeks.
- MTX 0.4 mg/kg (max. 25 mg) intravenously or intramuscularly for 5 days every 2 weeks.
- Actinomycin D pulse 1.25 mg/m2 intravenously every 2 weeks.
- Actinomycin D 0.5 mg intravenously for 5 days every 2 weeks.
- MTX 30"50 mg/m2 intramuscularly weekly, MTX 300 mg/m2 infusion every 2 weeks.

Abbreviation: MTX-FA, methotrexate"folinic acid

Table 2: World Health Organization scoring system based on prognostic factors modified as FIGO score

FIGO SCORE	0	1	2	4
Age	<40	≥40		
Antecedent pregnancy	Mole	Abortion	Term	
Interval months from index pregnancy	<4	4-<7	7->13	≥13
Pre-treatment serum hCG (IU/L)	<1000	1000-10000	10,000-100000	≥100000
Largest tumor size (including uterine tumor)	<3cm	3-5cm	≥5cm	
Site of Metastasis	Lung	Spleen, Kidney	GIT	Brain, Liver
Number of Metastasis	0	1-4	5-8	≥8
Previous failed Chemotherapy			Single Drug	≥2drugs

Notes:

1. The interval months from pregnancy is taken from when the pregnancy ended (not started).
2. The score for site of metastases is not additive. The highest scoring organ is taken to be the score (e.g. A patient with spleen and brain metastases scores 4, not 5)
3. lung metastases counted on CXR not on a Chest CT scan

High Risk GTN

- Multiple agent chemotherapy regimens are used to treat high-risk GTN. The most commonly used is EMA-CO (etoposide, methotrexate, ctinomycin D, cyclophosphamide, vincristine) (Box 4).
- About 20% of patients do not attain complete response with EMA-CO therapy but most can be salvaged with further therapy; leading to the overall survival rates as high as 95%.
- In minority of women, selective arterial embolization may be required for emergency situations such as bleeding from vagina, uterus or other metastatic sites, Thus, women with high-risk GTN must be managed at higher centres with all the facilities available.
- Surgical management in the form hysterectomy or pulmonary resections for chemotherapy-resistant oligometastatic disease is indicated.
- Again, monitoring is done with β-hCG assay every 2 weeks during treatment and response is assessed:
  1. Normal β-hCG levels: Continue chemotherapy for 2-3 more cycles.
  2. Good response followed by low levels β-hCG plateau or relapse from remission with EMA-CO: EMA-EP or EP-EMA is the most appropriate therapy

Ultra High-Risk GTN And Salvage Therapy

- In a subgroup of high-risk GTN women with WHO score of 13 and more or with liver, brain, or extensive metastases, starting standard chemotherapy may lead to do sudden tumor collapse with severe bleeding, metabolic acidosis, myelosuppression, septicemia, and multiple organ failure.
- Thus, induction chemotherapy with low dose Etoposide (100 mg/m2) and cisplatin (20 mg/m2) on days 1 and 2, repeated weekly for 1"3 cycles before starting EMACO regimen is recommended.
- For women with liver metastases, with or without brain metastases, EP/EMA or another more intensive chemotherapy regimen (Box 5), rather than EMA-CO, may yield a better outcome. These women should be considered for longer consolidation with 4 cycles of chemotherapy.
- For women with brain metastases, intrathecal methotrexate 12.5 mg along with incremental dose of methotrexate infusion upto 1g/m2 (to help cross the blood-brain barrier) can be given.
- Patients with resistance to EMA-CO are mostly salvaged with paclitaxel and etoposide alternating with paclitaxel and cisplatin (TE/TP) or with EP/EMA.

Box 4: EMA-CO cheEMA-CO (etoposide, methotrexate, actinomycin D, cyclophosphamide, vincristine) chemotherapy Regimens

Regimen 1

Day 1	Etoposide	100 mg/m2 intravenous infusion over 30 min
	Actinomycin	D0.5 mg intravenous bolus
	Methotrexate	100 mg/m2 intravenous bolus200 mg/m2 intravenous infusion over 12 h
Day 2	Etoposide	100 mg/m2 intravenous infusion over 30 min
	Actinomycin-	D0.5 mg intravenous bolus
	Folinic acid rescue	15 mg intramuscularly or orally every 12 h for four doses (starting 24 h after beginning the methotrexate infusion)

Regimen 2

Day 8	Vincristine	1 mg/m2 intravenous bolus (maximum 2 mg)
	Cyclophosphamide	600 mg/m2 intravenous infusion over 30 min

The two regimens alternate each week

- Recently, due to expression of PD-L1 on trophoblastic cells, data has suggested the role of pembrolizumab (PD-L 1 inhibitor) in drug resistant GTN.

Treatment of PSTT/ETT

Both PSTT and ETT are relatively chemoresistance as compared to choriocarcinoma. Thus, hysterectomy is the primary mode of treatment in most cases. However, ovaries can be preserved in young women with uterus confined disease to maintain the hormonal levels. Also, women with oligometastatic disease such as lung metastasis can be considered for surgical resection.

Box 5: Salvage therapies

- EP-EMA (etoposide, cisplatin, etoposide, methotrexate and actinomycin- D).
- TP/TE (paclitaxel, cisplatin/paclitaxel, etoposide).
- MBE (methotrexate, bleomycin, etoposide).
- VIP or ICE (etoposide, ifosfamide, and cisplatin or carboplatin).
- BEP (bleomycin, etoposide, cisplatin).
- Immunotherapy with pembrolizumab.

Follow up

Upon completion of treatment for GTN, at least 12-month follow up with monthly β-hCG monitoring as surveillance to relapse is recommended is essential. During this period, proper contraception must be advised and practiced.

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Exploring Platelet-Rich Plasma Treatment in Gynecology: A Promising Frontier

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Introduction

Regenerative medicine has flourished in recent years as treatment methods have shifted from traditional methods to employing the body's own cells and materials to promote recovery. Platelets contain numerous growth factors and cytokines that play crucial roles in tissue repair, regeneration, and angiogenesis. By isolating and concentrating platelets, Platelet Rich Plasma(PRP) therapy harnesses the body's natural healing mechanisms to promote tissue rejuvenation and repair. In this regard, platelet-rich plasma has been well studied and has been a key component of numerous clinical uses. Although the precise definition of platelet-rich plasma (PRP) is not standardised, it is commonly understood to be a blood derivative with a higher concentration of platelets than baseline whole blood levels. The words platelet-rich growth factors, platelet-rich fibrin (PRF) matrix, PRF, and platelet concentrate are also used in the literature to refer to platelet-rich preparations from peripheral blood in addition to PRP.

PRP is a naturally occurring substance that contains three to five times more growth factors than plasma and a high concentration of platelets. Platelets have a cocktail of chemical mediators in their alpha granules that promote angiogenesis and start cell regeneration, respectively, to cause tissue regeneration. These bioactive substances include insulin growth factor (IGF), vascular endothelial growth factor (VEGF), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), and epidermal growth factor (EGF). Platelet-rich plasma (PRP) therapy has gained significant attention in various medical specialties for its regenerative properties. While its applications in other specialities are well-known, its potential in gynecology has recently been emerging as a promising avenue for treating various conditions. This article delves into the realm of PRP treatment in gynecology, exploring its potential applications and existing evidence.

Biology of PRP: The biological basis for the clinical application of PRP lies in the local delivery of growth factors (GFs), cytokines, chemokines, proteins, and mediators - in physiological proportions - that aid in tissue healing and regeneration. This variety of bioactive molecules is secreted by three different types of granules (alpha, delta, and lambda) found inside the platelets. These mechanisms include the enhancement of anabolism, bone, and vessel remodelling, cell proliferation, angiogenesis, inflammation control, coagulation, and cell differentiation.

Preparation of PRP: Numerous commercial PRP devices are available that make PRP preparation easier. The venous blood drawn in anticoagulant containing tubes. The temperature is kept between 21-24 degrees to prevent platelet activation during centrifugation. The principle on which PRP preparation is based is Differential Centrifugation based on the difference in specific gravity of different components. The collected venous blood along with anticoagulant is subjected to first spin to get three layers-RBCS(bottom),buffy layer(middle) and plasma(top) (figure 1).The buffy layer contains both platelets(upper part) and leukocytes(lower part). Top layer and upper part of buffy layer are transferred to sterile tube and subjected to second spin to get platelet pellet. This pellet is then resuspended in plasma. However, a standardised procedure for PRP preparation has not been described yet and different studies have used different preparation protocols.

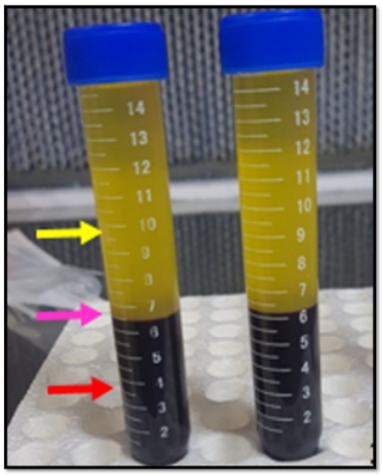

Figure 1: Separation into three layers after centrifugation. Upper layer(yellow arrow :plasma),middle buffy layer(pink arrow:platelets in upper part,leukocytes in lower part) and bottom layer(red arrow:erythrocytes)

In gynaecology, currently PRP is being used in the subspeciality of Reproductive Medicine, Urogynaecology and Aesthetic Gynaecology. The disorders which are being benefitted by this therapy are thin endometrium, poor ovarian reserve, recurrent implantation failure, stress urinary incontinence, pelvic organ prolapse, vaginal fistulas, bladder pain syndrome, female sexual dysfunction and vulvo vaginal dystrophy. The conditions are discussed here alongwith the current evidence.

PRP use in Reproductive medicine

Thin endometrium: This entity remains a clinical challenge for the reproductive clinicians. Endometrial receptivity is one of the most critical prognostic markers in the success of a pregnancy following embryo transfer. Quantitatively,<7 mm is often stated cut-off for thin or sub-optimal endometrium. It is associated with poor pregnancy outcome,recurrent implantation failures and high IVF cycle cancellation rates. A recent systematic review was done to study the efficacy of intrauterine PRP. It analysed seven studies on 625 women with thin endometrium(2 studies) and RIF(5 studies) undergoing FET cycle and concluded that intrauetrine PRP can improve clinical pregnancy rate in FET cycle. The route of this application can be through simple intrauterine instillation or hysteroscopy guided sub-endometrial injection.

Ovarian Rejuvenation: A recent systematic review of 4 non-randomised clinical studies by Panda et al(2020) showed significant improvement after ovarian PRP injection, on ovarian reserve parameters (AMH and AFC) with decrease in Serum FSH. Given the low-risk profile, the hypothetical benefit of PRP treatment on ovarian reserve parameters needs to be studies with larger randomised controlled trials.

Recurrent Implantation failure(RIF): The systematic reviews and metaanalyses although demonstrated a significant improvement of reproductive outcomes in case of autologous PRP intra-uterine administration in women with RIF but the studies had small sample sizes with lot of heterogeneity. There is need of properly designed RCTs to see the impact of PRP on reproductive outcomes. Moreover, it is imperative to establish a consensus upon the method of platelet isolation, along with the platelet concentration applied in the suggested treatment. ESHRE (2023) guidelines on RIF has not yet recommended intrauterine PRP.

Intrauterine adhesions(IUA)-PRP has potential role in regenerating endometrium after hysteroscopic adhesiolysis in Asherman syndrome. The efficacy however, depends on the amount of remaining basal endometrium. A systematic review by Albazee et al(2022) on PRP for management of IUA, done on 3 RCT concluded that PRP can improve the grade of IUA and duration and amount of menses. However more RCTs are needed to validate these conclusions

ESHRE Good Practice recommendations for add-ons in reproductive medicine(2023),in view of lack of safety evidence(both short term and long term),intrauterine or intraovarian PRP use is not recommended outside research settings.

PRP use in Urogynaecology

Platelet rich plasma is being used with promising results in Urogynaecology too. The disorders being treated are Stress Urinary Incontinence(SUI) ,early degrees of pelvic organ prolapse and even vaginal fistulas.

Stress Urinary Incontinence

PRP is being used for treatment of SUI. A double-blind, randomized controlled trial(RCT) was done on women with SUI where PRP injections at 3 levels of the urethra at 4- to 6-week intervals while control group were injected with sodium chloride 0.9%. The primary outcome was subjective evaluation as per the question 11a of the International Consultation on Incontinence Questionnaire-Female Lower Urinary Tract Symptoms (ICIQ-FLUTS) questionnaire. The subjective cure was significantly higher in the PRP group (32% vs 4%, $P < 0.001$).A significant reduction of urine loss assessed on the 1-hour pad test was observed in the PRP group compared with the sham group at 6-month follow-up without any adverse events.

However a recent systematic review on 6 prospective and 1 RCT to evaluate the efficacy and safety of platelet-rich plasma injections for the treatment of SUI has concluded that there is need for high-quality research studies to examine the role of PRP for the treatment of SUI.

Pelvic organ prolapse (POP)

Pelvic organ prolapse has been associated with significantly decreased collagen concentration compared to healthy controls. PRP leads to increase in collagen concentration of the fibrous connective tissue and promotes wound healing.A prospective observational study of 10 consecutive women requiring surgery for prolapse recurrence (stage II or higher). Surgery was followed by PRP injections. The success rate was 80% with complete symptom relief and sexual activity increased by 20% without dyspareunia. PRP use for site-specific prolapse repair was associated with good functional outcomes.

Vaginal Fistulas

Shirvan et al(2013) studied the effect of PRP injections in the peri-fistula tissue. At the end of three months, normal physical examination, complete dryness post-injection and normal cystography was found in 91.67% women and their International Consultation on Incontinence Questionnaire-Urinary Incontinence (ICIQ-UI) & Quality of Life (ICIQ-QOL) scores also improved. Further appropriately designed trials are required in this direction.

Interstitial cystitis or Bladder pain syndrome

A Systematic review done on five studies on patients with bladder Pain syndrome/Interstitial cystitis. Monthly intravesical PRP injections were given for 6 months. There was marked improvement in histology with decrease in inflammatory cytokines as well as pain symptom. This suggests that PRP has potential for urothelium regeneration also.However, further research is needed in this context

PRP in Aesthetic Gynaecology

Under this gynaecological subspeciality, PRP use has been tested in Female sexual dysfunction and vaginal rejuvenation.

Female Sexual Dysfunction

PRP is a non-surgical office treatment option using own growth factors.Here PRP injections are given in specific areas in vagina after local anesthesia cream application.This modality of treatment is called, " O SHOT" Therapy. PRP immediately activates tissue regeneration and enhancement in sexual reponse is dramatic.Improved arousal, stronger orgasm, reduced dyspareunia and increased natural lubrication has been reported in studies.

Vaginal rejuvenation

PRP has been used in regeneration of vaginal mucosa, muscles and skin.It works by increase in vaginal vascularity and subsequently sensitivity. The vaginal mucosa become thick, firm and youthful. Moreover, ligaments and muscles supporting urethra become stronger alleviating SUI. Kim et al (2017) reported use of PRP for vaginal rejuvenation and concluded that application of autologous lipofilling mixed with PRP in vaginal atrophy produced relief of symptoms, contour restoration and rejuvenated apprearance of external genitalia.

Vulval dystrophy

Anogenital area is the primary site of lichen sclerosus(LS), a persistent inflammatory dermatological disorder which is due to

autoimmunity and genetic predisposition and associated with progressive pruritis ,dyspareunia ,genital bleeding and widespread scarring. There is currently no known cure for LS; all available treatments target the disease's symptoms. The preferred treatment is corticosteroid administration, but it requires a lot of maintenance, has unpredictable outcomes, and has low compliance rates. PRP has been investigated as a potential therapy for female patients with lichen sclerosus. Willison et al studied the use of PRP in LS patients who were unresponsive to topical steroid therapy. They used 3 PRP injections, 4 to 6 weeks apart and at the end of one year, into the damaged parts of the external genitalia, such as the labia majora, labia minora, clitoris, and clitoral hood. Almost all patients experienced clinical improvements in the size of their lesions, with little pain and no complications. In 28.6% of patients, the lesions were completely vanished. The researchers concluded that PRP injections could be an alternative to corticosteroids in the treatment of vulvovaginal autoimmune diseases like LS.

Conclusion

PRP is safe, simple, affordable method of regenerative medicine based on naturally occurring concentration of autologous growth factors and biologically active molecules that have a high potential for aiding tissue healing and regeneration. Furthermore, due to its autologous origin the risk of infection transmission or adverse immune response is nil. It has a wide application in gynecology sub-specialities. There is need of standardization of preparation method. The existing evidence is mainly in the form of observational and non-randomised studies. Hence, there is need of well designed studies. The long term safety profile is still awaited.

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Caesarean Section Audit

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A Clinical audit is a process of quality improvement which aims at improving patient care through systematic review of existing care against explicit criteria, which is followed by implementation of changes which are expected to bring the existing care as close to the standard care as possible.[1]

A clinical audit has the following stages (Figure 1):

1. Select a topic
2. Review standards
3. Data collection and analysis
4. Compare the data with standards
5. Feeding back the results
6. Discussing and implementing changes
7. After a suitable amount of time, collect data again (second set)
8. Analyze new data
9. Feeding back new results
10. Assess whether there is any change in practice/ improvement in results.

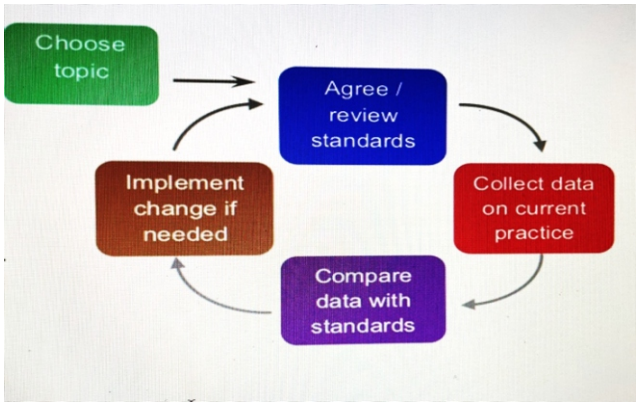

Figure 1: The Audit Cycle

Need for cesarean section (CS) audit

Appropriately indicated CS saves maternal and fetal lives but with increasing CS rates the various short term and long-term complications are becoming more and more common. Uterine niche, scar ectopic and placenta accreta syndrome are not rare entities anymore.

World Health Organization (WHO), based on systematic reviews and available data on caesarean section (CS), concluded that at

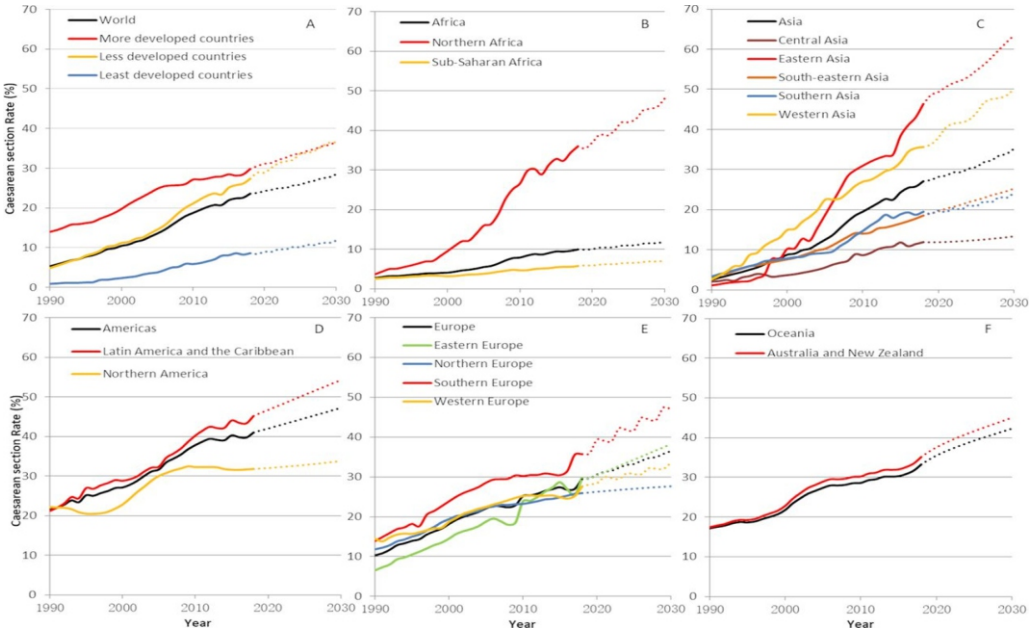

Figure 2 : Trends (1990–2018) and projections (2030) in global, regional and subregional estimates of CS rates. Solid lines are trend estimates and dotted lines are projections. (A) World; (B) Africa; (C) Asia; (D) Americas; (E) Europe; (F) Oceania. (3)

population level, caesarean section rates greater than 10% are not associated with improvement in maternal or perinatal mortality. [2]

Trend analysis of Caesarean section shows that the global average of CS has almost tripled from 6.7% in 1990 to 19.1% in 2014. The rise is seen not just in high- income but in middle as well as low-income countries as well (Figure 2).

According to UN's (United Nation's) geographical grouping, 2018, 21% of babies worldwide are born via a Caesarean section, and the number is expected to reach 28% by 2030 (3). This is a cause of global concern and calls for action and facility level as well as Community/State level CS audit is the need of the hour.

Ways to classify CS

To perform CS audit, Cesarean sections need to be classified. Cesarean sections have been classified based on

- Who (woman based)
- Why (indication based)
- When (urgency based)
- Others such as Where, How, by whom the caesarean was performed [4,5]

Woman based cesarean sections -These classifications were based on the characteristics of the women undergoing the caesarean section.

These classification systems performed best. They were mutually exclusive (each woman fit into only one category), totally inclusive (all women fit into these categories) and could be prospectively performed. Of the different woman based classification systems, Robson's Ten group classification system (TGCS) fared best.

Indication based cesarean sections- The limitation of this classification:

A: There is no one standard classification system for indication based categorization.

B: The categories are not mutually exclusive i.e. one patient can fit into more than one category (indication)

C: Some classification systems are not totally inclusive (i.e. the indication will not fit into any category).

D: The category of indication is sometimes retrospectively identified,

Urgency based classifications:

These divided the Cesarean section based on the degree of urgency of the CS.

Most classification systems divided such caesareans into four categories:

1. Immediate threat to mother's/ fetus's life
2. Maternal/fetal compromise but not immediately life-threatening
3. Needs early delivery but not maternal/ fetal compromise
4. Elective CS

Other classifications:

One classification system used green/yellow/red system to grade degree of urgency.

WHO ICD-10 classification

RCOG 2001 classification according to the organization and staffing.

Robson's ten group classification system

For formulating strategies, it was important to choose a classification system, in which all women would be included (totally inclusive), each woman is allocated one category (mutually exclusive), which can compare data between different types of hospitals (primary/ secondary/ tertiary), between different countries (low/middle/high income countries) as well as compare performance over time. The classification which best fits these criteria was the Ten group classification system (TGCS), or the "Robson classification".

Robson's classification identifies and compares CS rate in a consistent, standardized and action-oriented manner. It should be applied to ALL the women presenting to the delivery unit of every hospital and all women should be allocated to one of the ten Robson groups irrespective of the mode of delivery.

WHO in 2014 proposed that all facilities should use the "Robson classification" for classification of Cesarean section and for the purpose of data

collection, analysis, intra-facility and inter facility comparison and auditing.[5]

Robson classification uses 6 basic obstetric variables of a woman to classify her into one of the 10 groups: parity, gestational age, number of fetuses, presentation, onset of labour and previous caesarean section.

1. Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour
2. Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who had
   (a) Labour induced or
   (b) Were delivered by CS before labour
3. Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour
4. Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation who had
   (a) Labour induced or
   (b) Were delivered by CS before labour
5. All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥37 weeks gestation
   5.1: Previous one CS
   5.2: Previous two or more CS
6. All nulliparous women with a single breech pregnancy
7. All multiparous women with a single breech pregnancy including women with previous CS(s)
8. All women with multiple pregnancies including women with previous CS(s)
9. All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)
10. All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

All pregnancies with face presentation/ brow presentation and compound presentation with head will be counted in category 1-4 depending on parity and labour onset.

Breech with successful cephalic version will be classified according to final presentation.

Validation of data before for CS audit using TGCS

Define birth for country/setting: It is important first and foremost to correctly define birth for country/setting. Middle/low-income countries keep threshold of viability as 1000gram (28 weeks). To be able to correctly interpret data and to compare the data that the threshold of viability be written at the footnote

Figure 3: Robson's Ten group classification system

in TGCS report table. (see table 1 for reference). All viable pregnancies irrespective of stillbirth/IUD/ fetal malformation should be counted.

Total number of women delivered (total of column 3 in Robson table) refers to the total number of deliveries whereby a twin/ triplet delivery is counted as 1 delivery.

The total number of caesarean sections is included in the total of column 2 of the table.

100% CS rate in Subgroup 2b and 4b and 9. Subgroup 2b and 4b are for the women (primipara and multipara respectively) who undergo caesarean section before going into labour, hence the rate of caesarean section in these women will always be 100%.

The size of group 9 (Transverse /Oblique) should be less than 1%. If greater than this, there is a chance that breech pregnancies have been misclassified as transverse.

Caesarean section rate of group 9 should be 100%.

Ratio of groups 1:2, 3:4 and 6:7 should be > 2:1 but also depends on the population profile presenting to the facility. If Ratio of group 1:2 is lower than 2:1, suspect poor quality data collection as oxytocin augmentations may have been misclassified as inductions.

For the same institute, the ratio of group 3:4 should be greater than ratio of group 1:2.

Some patients may not be classified into any group and that is because of the missing information on the six characteristics required to classify the women into TGCS. Ideally this should be zero.

Percentage in each group can be used to compare inter facility and intra facility outcomes

TGCS depending upon profile of the population

Column 4 helps us understand type of population served by the hospital.

Size of group 1+2: (column 4 of group 1+2): represents the first time mothers. This usually constitutes about 35-42% of the obstetric population. A higher group size than this would mean that the population of the country/ the region prefer only one child. In populations where women prefer having more than 1 child, the group 3+4 would be larger.

Ratio of group 1 and 2 should be 2:1. A lower ratio means either more inductions or more pre labour caesarean sections. A high pre labour caesarean section rate may be seen in tertiary care centers/ referral centers with high-risk women. A high ratio would be seen in primary/ secondary care centers where high risk women are referred or where facility of emergency caesarean section are not available.

Size of group 3+4: (column 4 of group 3+4): represents about 30% women. A higher rate point towards a trend of multiparity.

A lower rate could either be due to more women choosing to have only one child OR due to a higher caesarean section rate of that hospital/region/country, leading to more multiparas falling in group 5 (previous caesarean section).

Size of group 5 (Column 4 of group 5): this group includes women with previous section. The group size will depend upon the caesarean rate of the institute/ country (the size of the group is roughly half of the cesarean section rate) Larger group 5 means higher trend towards caesarean section in the past. It could also be high in tertiary care hospitals which are serving to more high risk women including women with one or more caesarean sections.

Size of group 6+7 (column 4 of group 6+7): represents breech presentations, which should be around 3%. Prematurity is the most common cause for breech deliveries. This could represent a tertiary care hospital where referral rate is higher. Such centers also tend to have a higher group 10 size.

Size of group 8 (column 4 of group 8): the group includes women with multiple pregnancies, which should normally constitute 1.5-2% of the total women. Higher percentage points towards the center being a referral center or having ART/IVF facility.

Column 1	2	3	4	5	6	7
Group	No of CS in the group	No of women in the group	Group size (%)	Group CS rate (%)	Absolute group contribution to overall CS rate (%)	Relative group contribution to overall CS rate (%)
			no of women in the group. *100 / total women delivered in the hospital	no of CS in the group *100 / total women in the group	no of CS in the group *100 / total women delivered in the hospital	no of CS in the group *100 / total CS in the hospital
1	n1	N1	N1 *100 / N	n1 *100 / N1	n1 *100 / N	n1 *100 / n
2 2a 2b	n2	N2	35-42%	20-35% (for 2b: 100%)		
3				<3%		
4 4a 4b			30%	<15% (for 4b: 100%)		
5 5.1 5.2			Half of total CS rate Usually <10%	50-60%		If v high => ↑ CS rate in past
6			3-4%			
7				80-100%		
8			1.5-2%	60%		
9			<1%	100%		
10			<5%	30%		
Total	Total CS in the hospital, n	Total women delivered in hopsial , N		Overall cs rate= n/N*100 (overall rate should be <15%)		

Table 1: Robson classification report table. Based on Robson's report table, we can get an idea about the type of population served by different hospitals/ countries

Size of group 10 (column 4 of group 10): women having preterm births should constitute <5% of the total. A higher percentage as discussed earlier implies the facility being a referral center. A high caesarean section in this group (column 5) usually points towards high proportion of high-risk women such as those with severe pre-eclampsia/ severe FGR.

CS audit by using Robson classification:

Column 5 and column 7 help us assess the caesarean section rate

Look at column 5 (to know what percentage of women of that group undergo a caesarean section)

- For group 1, try to achieve a CS rate of less than 10%
- For group 2, the suggested CS rate is between 20-35%. A higher 2b group means more women undergo CS before labour indicating a high-risk population while, a higher rate in subgroup 2a means a poor candidate choice/low threshold for induction.
- For group 3, the CS rate should not exceed 3%.
- In group 4, the aim should be to keep CS rate below 15%. A higher rate in 4a indicates a poor choice of candidate/indication or agent for induction of labour. High rate in 4b indicates more women undergo CS before labour indicating a high-risk population.
- For group 5, CS rate of 50-60% can be considered appropriate. Here we must look at

contribution of group 5.2 (more than 1 previous CS). Higher rates in this group could indicate towards a tertiary care center with more women having more than 1 previous section. A higher rate in 5.1 (previous 1 CS) means either more women opting for elective repeat CS or a poor counselling of women with previous 1 LSCS.

- Group 8, with multiple pregnancies should be around 60%. A higher rate may be seen in tertiary care centers which have more complicated varieties of twins, or ones with previous scar.
- In group 10, CS rate is usually around 30%. A higher rate is seen in centers with more high-risk women.

Look at column 7 (relative contribution of the group to overall CS rate)

- Total of group 1,2,5 in column 7 usually contributes 2/3rd to caesarean section rate. When focusing on reducing total caesarean section rate, the focus should be on these.
- In group 5, if it is very high, it means that the caesarean section of the population has been high. It can also be seen in tertiary care/ referral centers, where the group size of 5.2 or 5.1 (previous 2 or 1 CS) is high.

Performing Robson classification helps to identify target groups in which the caesarean section rate can be optimized by repeatedly introducing corrective measures and then analyzing the impact. The cycle is further continued by reassessing the groups that require intervention, thus continuing the cycle the CS audit cycle.

The Delhi State CS audit initiative by DFW.

The initiative aims to analyze the CS rate and identify the areas for facility level and patient level interventions in all Delhi Hospitals. A uniform, simple, user friendly google form was developed and is used for reporting of all caesarean sections. Data on Robson's categorization of vaginal deliveries and caesarean section is also sought from the institutions. Based on these: group size, group CS rate, absolute CS rate and relative CS rates are calculated to understand the patient profile and practices of the hospital. By utilizing this data individual hospitals decide interventions in their hospitals. These interventions range from steps for correct identification of Robson classification, to filling of google form, collection of data, training, and re-training of doctors, doing a fishbone/ 5 Whys analysis for reason for CS rate (figure 5), involving consultants/ senior doctors in decision making for CS. This effort is likely to result in optimization of CS Rates by introspection and self-correction without compromising neonatal and maternal outcomes.

Conclusion

Increase in CS rate is approaching epidemic proportions and optimizing CS rate is essential for improving perinatal and reproductive health outcomes of the population. Robson's TGCS of all deliveries can help us subclassify all CS in a scientific manner and optimize the caesarean section rate by planning and assessing the required interventions. Its important to understand the utilize CS audit efficiently to bring about perfect harmony between CS rates and maternal/neonatal outcomes.

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Maternal Vaccination

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Vaccination is the process of stimulating a protective adaptive immune response against microbes by exposure to nonpathogenic forms or components of the microbes. A vaccine is a biological preparation that improves immunity to a particular disease. Most vaccines generate antibodies that prevent the damage caused by toxins or that neutralize the pathogen. Vaccines work by inducing active immunity and by providing immunological memory. Immunological memory allows the immune system to recognize and respond rapidly to natural infection when exposed at a later stage; this prevents or modifies the effect of the disease.

Types of vaccines-

- Live vaccines
- Killed vaccines
- Purified macromolecules

Live vaccines

- Attenuated vaccines that utilize microbes that have been treated to abolish their infectivity and pathogenicity yet still retain their antigenicity.
- There is a risk of reversion to a virulent form and potential to infect the fetus. Use of live vaccines is generally contraindicated during pregnancy.
- These risks must be balanced against the expected chance of contracting the disease with its own complications.
- Yellow fever vaccine, although a live attenuated vaccine, can be given during travel to endemic areas (Argentina, Brazil, Kenya, Tanzania) in women at high risk of exposure.

Killed vaccines

- Immunity is conferred by inactivating the microbe with heat or chemical.
- Inferior to live vaccines.
- Since these preparations are injected, the immune response does not take place at the site of natural infection.
- Examples include Influenza vaccine, Hepatitis A vaccine.

Purified macromolecules

Three general forms are-

- Inactivated toxins - Bacterial toxins can be detoxified by formaldehyde treatment and used to stimulate immunity. Example - Diphtheria toxoid and tetanus toxoid.
- Conjugate vaccines- As the glycans tend to be poorly immunogenic, they are conjugated to a carrier protein to increase their immunogenicity. Example - Pneumococcal and meningococcal vaccine
- Subunit vaccines- Include only the antigens that stimulate the immune system. Example - Hepatitis B vaccine and acellular pertussis vaccine

General principles of vaccination in pregnancy

- During pregnancy the benefits to the mother and the fetus should outweigh the risks.
- Toxoids, inactivated virus vaccines and immunoglobulin preparations are generally considered safe for administration to pregnant women.[1] If prompt administration is not medically indicated, it is preferable to delay administration of these agents until the second trimester to allow for completion of the critical period of fetal organogenesis.
- Aim of Vaccination in pregnancy is to boost the concentration of vaccine-specific antibody in the mother to increase antibody concentration in the infant at birth. It helps by providing protection until the period of maximum susceptibility or risk has passed or

Table 1- General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP)[2]

• **Recommended before pregnancy**	1. MMR
• Recommended for routine use in pregnancy	1. TdaP 2. Influenza
• Recommended for special circumstances	1. Hepatitis A and B 2. Pneumococcal 3. Meningococcal 4. Travel Vaccination -Yellow fever 5. Zoonotic vaccine preventable diseases- Rabies
• Contraindicated in pregnancy	1. BCG 2. MMR 3. Varicella 4. Herpes Zoster 5. HPV

Table 2- Vaccination in pregnancy as per recommendation of FOGSI 2020

Vaccination before pregnancy	Catch up Vaccination. 1. MMR 2. Varicella Sickle cell disease/splenectomy 1. Pneumococcal 2. Meningococcal 3. H. Influenza
Vaccination during pregnancy	1. Tdap 28-32 weeks 2. Influenza
Vaccination during pregnancy under special conditions	1. Yellow Fever vaccine 2. Pneumococcal 3. Meningococcal 4. Hepatitis A 5. Hepatitis B 6. Typhoid

until the infant has completed the routine infant immunizations.[1]

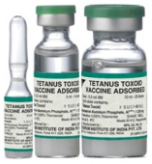
Vaccination indicated in pregnancy-

1. Tetanus in pregnancy

Tetanus is caused by the release of exotoxin (tetanospasmin) produced by Clostridium tetani, a non-invasive gram-positive anaerobic bacillus. Tetanospasmin is taken up by the neuronal end plates and prevents neurotransmitter release at the synaptic junction. This leads to muscular spasm, respiratory compromise, and autonomic dysfunction and is irreversible.

Table 3: Immunization Schedule- TT (NIS of India)[3]

Pregnant Women	
Early in Pregnancy	TT-1
4 weeks after TT-1	TT-2
Pregnant within 3 years of last pregnancy with both doses of TT	TT Booster



Maternal and neonatal tetanus are caused by unhygienic methods of delivery, abortion, or umbilical cord care. They have a similar clinical course.

Overall case fatality rates for patients admitted to the hospital with neonatal tetanus in developing countries are 8-50%, while case fatality rate is as high as 100% without hospital care. In 1983, the Government of India introduced two doses of tetanus toxoid to all pregnant women during each pregnancy as part of National Immunization Policy. In 2015, Maternal and Neonatal Tetanus was eliminated in India such that the annual rate decreased to less than 1 per 1000 live births.

Vaccine – Tetanus and Diphtheria (Adsorbed) 0.5ml deep IM Upper arm. Available TT will be used first before starting use of Td

2. Diphtheria

Acute, communicable disease of upper respiratory tract caused by Corynebacterium diphtheriae, which grows in the pharynx to form a pseudo membrane. Transmission is by direct contact/sneezing/coughing. Diphtheria is a potentially fatal disease in at least 10 percent of cases that occur, and if left untreated can cause severe damage to the kidneys, nervous system, and heart. Nonimmune children are commonly affected before the age of 5, but improved coverage in children has shifted the age distribution to poorly immunized adults.

Why shift to td vaccine? –

- Since 1998, WHO has recommended that TT should be replaced by Td vaccine.
- Rationale- need to sustain protection against diphtheria due to the waning immunity following the primary series of DTP

containing vaccine given in the first year of life.

- Td vaccine can be used instead of TT from the age of 4 years, including during pregnancy.
- In August 2018, the MOHFW had decided to replace TT vaccine with Td vaccine in UIP.
- As from 1 January 2020, UNICEF has stopped the supply of TT vaccine.
- Vaccination during pregnancy serves to boost immunity and increase the duration of protection in those pregnant women who had not received the full set of recommended doses.

Tdap vaccine

- It can prevent tetanus, diphtheria, and pertussis.
- It can be given at 7 years of age or older.

CDC recommendations for Tdap

- Adolescents should receive a single dose of tdap, preferably at age 11-12 years.
- Adults who have never received Tdap should get a dose of tdap.
- Adults should receive a booster dose every 10 years, or earlier in case of a dirty wound, which can be either Td or Tdap.
- Pregnant women should get a dose of Tdap during every pregnancy, to protect the newborn from pertussis.

3. Pertusis

Pertussis, also known as "whooping cough", is a highly contagious respiratory infection caused by the gram- negative bacterium Bordetella pertussis.

Transmission is through airborne droplets or direct contact with nasopharyngeal discharge from an infected person. It affects people of all ages, but newborns are at a higher risk of infection.

Serious complications include pneumonia and seizure and even death can occur. India ranks no. 1 globally with – 24000 pertussis cases reported by WHO in 2017. Mothers have been identified as the source of infection in 37% of neonatal pertussis cases & are the most common source of pertussis infection for newborn infants. However, pertussis continues to be an under-diagnosed & under- reported disease.

Why shift to tdaP?[4]

- Young infants are at increased risk for death from pertussis and are entirely dependent on passive immunization from maternal antibodies until the infant vaccine series is initiated at 6 weeks (pentavalent-1)
- It is one of the most cost-effective strategies in protecting newborn/young infants from neonatal pertussis.
- Since maternal anti-pertussis antibodies are relatively short-lived, to maximize passive transfer to the fetus, a dose of Tdap is ideally given between 27- and 36- weeks' gestation.
- However, if received early in pregnancy due to a sustained wound or community outbreak, then it is not to be repeated at 27-36 weeks.
- Other than CDC, RCOG, ACOG and FOGSI have also recommended this vaccine in third trimester. However, it is not included in UIP of India yet.

About 2 weeks after vaccination, the mother develops antibodies to influenza and whooping cough. Antibodies enter placenta and transfer to baby. The baby is born with antibodies that provide protection against influenza and whooping cough for the first few months of life.

4. Influenza Infection in Pregnancy

Influenza (flu), an RNA virus with A and B stereotypes causes respiratory infection, including pneumonitis, and is responsible for both endemic and pandemic flu. Transmission is by aerosolized droplets. Incubation period- 1 to 4 days. Etiopathology is that virus quickly infects ciliated columnar epithelium, alveolar cells, mucus gland cells, and macrophages.

Symptoms- fever, cough, myalgia, and chills. Infection is self-limited. Complications- pneumonia (most frequent complication).

In a study, it was observed that pneumonia developed in 12 percent of gravidas with

Table 4: Types of Influenza Vaccine

	Quadrivalent vaccine	Trivalent vaccine
Composition	Split virions- disruption of viral membrane	Subunit- disruption of viral membrane and removal of internal subviral core
Response	Cellular and antibody response as core proteins is maintained	Only antibody response as core proteins is removed
No. of subtypes of influenza virus	2A and 2B	2A and 1B
Clinical efficiency	Better	Less effective

influenza. Also, infected pregnant women are more likely to be hospitalized and admitted to an ICU (CDC). Risk factors for increased morbidity included late pregnancy, smoking, and chronic hypertension. Severe infection has a maternal mortality rate of 1 percent. Influenza accounted for 12 percent of pregnancy-related deaths during the 2009 to 2010 pandemic.[5]

Influenza Infection- Effects on Fetus –

- Higher rates of neural-tube defects in neonates born to women with influenza early in pregnancy[6]
- First-trimester abortion, preterm delivery, low birth weight and stillbirth have been reported and correlate with the severity of infection. (CDC 2011, Fell 2017)

Knowing that pregnant women who contract influenza are at greater risk of maternal morbidity and mortality in addition to fetal morbidity, Influenza vaccination for pregnant women is important and recommended by CDC, ACOG, WHO and FOGSI. It also offers protection to the newborn who cannot be vaccinated for the first 6 months of life.

Recommendations For Influenza Vaccine in Pregnancy

ACOG 2018 recommendation

- Women who are or will be pregnant during influenza season should receive an inactivated influenza vaccine as soon as it is available, during any trimester. (CDC and ACOG)
- Due to the high potential for morbidity postexposure prophylaxis (75mg of oseltamivir once daily for 10 days) be considered for pregnant women and women who are up to 2 weeks postpartum.
- If oseltamivir is unavailable, zanamivir can be substituted, two inhalations once daily for 10 days.

FOGSI 2019 recommendation

- Inactivated Influenza Vaccine (quadrivalent)
- Dosage- 0.5ml I/M, can be given any time during pregnancy, and is very important to give between October and January.

Vaccination in Special Conditions-

1. Hepatitis A

- Hepatitis A is caused by RNA picornavirus.
- Transmission: feco-oral route, blood (short period of viremia)
- Incubation period – approx. 4 weeks
- Signs and symptoms are often non-specific but there is no chronic stage.
- Outcomes: good in developed countries, but maternal and perinatal mortality rates increase in resource poor countries.
- Fetal effects- neonatal cholestasis and preterm birth, but no teratogenicity has been reported.

HAVRIX - 1.0ml IM, 2 doses, 6-12 months apart. CDC and ACOG have recommended that pregnant women at high risk of infection should receive HAV vaccine. Its Category C. Risk factors are travel to endemic areas, outbreaks, and

exposure to individuals with HAV infection.

2. Hepatitis B

- Caused by double stranded DNA virus.
- Incubation period is 180 days.
- Transmission is through body fluids of any kind and the most effective is through serum.
- Most infections in pregnancy are chronic and asymptomatic.
- HBV vaccination is the best preventive measure, including administration both preconception and during pregnancy.
- The 3 dose HBV vaccine series should be initiated for pregnant women who have not been vaccinated previously and are at a high risk of acquiring infection.
- Hepatitis B vaccination with an ongoing pregnancy is safe and does not warrant a termination (FOGSI)

Pregnant women who are at risk of Hepatitis B infection

- More than one sex partner during the previous 6 months
- Have been evaluated or treated for an STD
- Recent or current injection drug use
- Having had an HBsAg-positive sex partner

Perinatal transmission prevention by can be done by -

- Identifying HBV infected pregnant mother
- Hep B immunoglobulin and Heb B vaccine to newborn within 12 hours of birth
- Hepatitis B vaccination with an ongoing pregnancy is safe and does not warrant a termination.

HBV vaccination is by using Recombivax, 1.0ml IM and schedule is 0, 1, 6 months.

3. Pneumococcal vaccine

High risk patients are-

- Women with heart disease
- lung disease or sickle cell disease
- Diabetic
- Smoker

Vaccine –PPSV23, should be administered (1 dose) 0.5 ml IM.

4. Meningococcal Vaccine

Meningococcal disease outbreak

Vaccine- Quadrivalent meningococcal conjugate vaccine (MPSV4),

1 dose,0.5ml, IM

5. Yellow Fever Vaccine

- Yellow Fever - Travel infection vaccine
- During pregnancy if a woman travels (Africa and South America) and her risk of exposure and infection is high enough to outweigh any potential theoretical risk of vaccination
- Limited safety data in pregnancy
- 17D, live attenuated, 0.5ml subcutaneous upper arm

6. Rabies vaccine[7]

- Rabies is nearly 100% fatal disease, there is no contraindication to PEP.
- Pregnancy and lactation are no contraindications for rabies PEP in the event of an exposure.
- No adverse effect on pregnant woman, course of pregnancy, fetus, or lactating mother.
- Rabies pre and post exposure prophylaxis recommended.

Vaccines Contraindicated in pregnancy–

- **BCG** - CDC does not recommend administration of BCG vaccination (live attenuated) during pregnancy, even though no harmful effects of BCG vaccination have

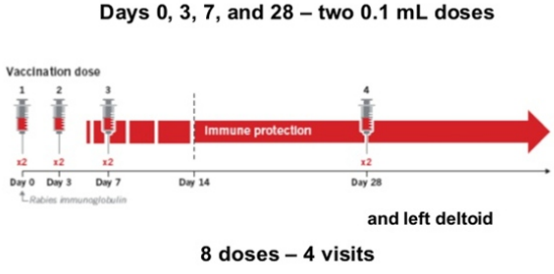


Figure 1: National Guidelines on Rabies Prophylaxis

been observed on the foetus.

- **MMR** - CDC does not recommend administration of BCG vaccination (live attenuated) during pregnancy, even though no harmful effects of BCG vaccination have been observed on the fetus.
- **HPV** - WHO and ACOG recommend avoiding HPV vaccination during pregnancy. However, when administered during pregnancy, it has not been associated with adverse pregnancy outcomes, including major malformations. If administered inadvertently, termination of pregnancy should not be considered. True safety of vaccination in pregnancy has yet not been established.
- **Varicella** - Not recommended for pregnant women or for those who may become pregnant within a month following each vaccine dose. Wild type varicella can cause congenital infection. The attenuated vaccine virus is not secreted in breast milk, and so postpartum vaccination can be given. An attenuated live-virus vaccine, Varivax, is recommended for nonpregnant adolescents and adults with no history of Varicella: in two doses, 4 to 8 weeks apart.

Vaccines under research –

- **GBS Vaccinea** - Aim- protect the new-born against group B streptococcal infections through maternal immunizationIt has been identified as a priority by WHO.
- **RSV Vaccineb** - RSV can cause severe pneumonia and bronchiolitis, especially in infants less than 6 months of age. No licensed vaccine so far.[8]

Benefits of Vaccination in Pregnancy

- Prevents morbidity and mortality of vaccine preventable diseases.
- Provides important health benefits to both the mother and fetus.
- Strengthens the immune system that can fight off serious infectious diseases.
- Strengthens maternal immunity which passes to the baby during pregnancy.
- Keeps the child safe during first few months of life till baby gets his own vaccination.

Breastfeeding in Vaccination

- Inactivated, recombinant, subunit, polysaccharide, conjugated vaccines and toxoids pose no risk in pregnancy, and can also be given during breastfeeding.
- Majority of live viruses in vaccines have also not been demonstrated in human breast milk.
- Viral vaccines (both inactivated and live) administered to a lactating woman do not affect the safety of breastfeeding for women or their infants.
- Breastfeeding does not adversely affect the success or the safety of the vaccination.

Conclusion

- Vaccination in pregnancy is a cost- effective strategy to improve pregnancy outcomes in India.
- The live vaccine poses a theoretical risk to the developing fetus. Therefore, all live vaccines should be avoided during pregnancy.
- FOGSI recommended vaccines in pregnancy- TdaP and influenza.

Last But Not the Least- Covid 19 Vaccine

- People who are pregnant and part of a group recommended (e.g., healthcare personnel, followed by other frontline essential workers) to receive the COVID-19 vaccine may choose to be vaccinated.
- There is limited data about the safety of COVID-19 vaccines for people who are pregnant.
- Getting vaccinated is a personal choice for people who are pregnant. (CDC,2020)

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Anaemia Mukt Bharat: How far we have reached

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"If you can see a problem, you can solve it"

Anaemia, affects approximately 2.36 billion individuals globally, and India carries its largest burden. Although anaemia is widespread in the country, it especially affects women in the reproductive age group, adolescent girls and children. It is estimated that over 50 percent of pregnant women are anaemic. Anemia is a serious concern for children also because it can impair cognitive development, stunt growth, and increase morbidity from infectious diseases.

The signs and symptoms of anaemia include pallor of the skin and conjunctiva, fatigue, shortness of breath, lack of appetite which are nonspecific and difficult to detect. Indeed, clinical detection of anaemia is influenced by so many variables, such as skin thickness and pigmentation, that it is unreliable unless the anaemia is very severe.

There are many forms of anaemia, with different causes and treatment. The most common causes of anaemia include nutritional deficiencies, due to inadequate (or insufficient) intake of minerals (particularly iron) and vitamins from the diet (Global Nutrition Report, 2020)

Anaemic prevalence varies among different states/UTs as per NFHS 5. Ladakh rank at the top on the list of anaemic prevalence states with 92.8% of the women (15-49 yrs), 96.9% and 93.1% of adolescent boys and girls are anaemic respectively. Followed by West Bengal with 71.4 % of women, 70.8 % of adolescent girls and 38.7 % of adolescent boys are anaemic.

Kerala ranks at the bottom of list with just 36.3 % of women, 32.5 % & 27.4 % of adolescent girls and boys are anaemic respectively. Delhi (NCR) records low on list with 49.9 % of all women being anaemic and 51.6 % and 18.9% of adolescent boys and girls are anaemic.

Table 1: The prevalence of anaemia among six age groups as per the National Family Health Survey 5 (2019-21)

Men (15-49 yrs)	25%
Women (15- 49 yrs)	**57%**
Adolescent boys (15-19 yrs)	31.1%
Adolescent girls (15-19 yrs)	**59.1%**
Pregnant women (15-49 yrs)	**52.2%**
Children (6- 59 Months)	**67.1%**

Why women are more susceptible to anaemia than men ?

Women are susceptible to anaemia of low haemoglobin concentration due to their unique physiological needs, including menstrual blood loss, and pregnancy. Therefore, the burden of anaemia is disproportionately higher in women as compared to men. This is particularly true for low- and middle-income countries.

Chronological evolution of Programmes

The first national anaemia control programme started in 1970 which has been evolved to currently ongoing I-NIPI over the years. Over the years not only the beneficiary groups have changed, but also the dosage and tablet coating and strategy has changed and evolved. Table 2 describes the chronological evolution of national anaemia programmes.

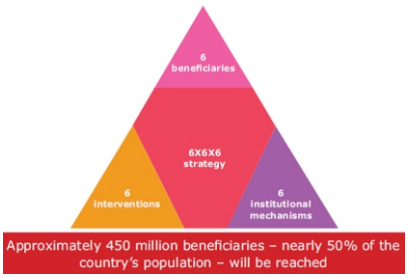
Intensified national iron plus intiative (Anaemia mukt Bharat)

The Anaemia Mukt Bharat (AMB) program was launched in 2018, focusing on reducing anaemia from 50% in 2016 to 32% by 2022. AMB is essentially a refinement of strategies that builds on the learning and experience from previous programmes including the National Iron Plus Initiative (NIPI) and puts forth a 6×6 6 strategic approach emphasizing on six beneficiary groups, six institutional mechanisms and six interventions.

Table 2: Chronological evolution of anaemic programmes in India

Year	Target Group	Interventions
1970- National Nutritional Anaemia Prophylaxis Programme (NNAPP)	• Pregnant and Lactating women • Children 1-5years	• 60mg iron and 0.5mg folic acid daily for 100 days • 20mg iron and 0.1 mg folic acid daily for 100 days
1990 - National Anaemia Control Programme	Pregnant, Lactating women and Children 1- 5 years	Dosage changed to 100 mg iron in pregnancy. Anaemic person receives 2 tablets.
2012- Weekly Iron Folic Acid Supplementation Programme	Adolescent girls and boys enrolled in government/government aided/municipal schools from 6th to 12th classes, and Adolescent Girls who are not in school.	100mg elemental iron and 500µg folic acid for 52 weeks in a year.
2013 - National Iron Plus Initiative (NIPI)	Life cycle approach	Targeted approach for anaemic persons and mass programme for non-anaemic persons.
2018 - Poshan Abhiyaan	Prime Ministers Overarching Scheme for Holistic Nutrition is India's flagship programme to improve nutritional outcome	
2019- Intensified National iron plus initiative (I-NIPI).	6X6X6 strategy	The iron dosage was reduced from100mg to 60mg for adults

The 6x6x6 strategy of AMB is summarised in table no.3 is a positive step and is ambitious in it's goal to reduce to reduce the prevalence of anaemia by 3% points per year.



6 Beneficiaries	6 Interventions	6 Institutional Mechanisms
Children (6–59 months)	Prophylactic Iron Folic Acid Supplementation	Intra-ministerial coordination
Adolescent girls (15–19 years)	Deworming	Strengthening supply chain and logistics
Adolescent boys (15–19 years)	Intensified year-round Behaviour Change Communication Campaign (Solid Body, Smart Mind) including ensuring delayed cord clamping	National Centre of Excellence and Advanced Research on Anemia Control
Women of reproductive age	Testing of anemia using digital methods and point of care treatment	National Anemia Mukt Bharat Unit
Pregnant women	Mandatory provision of iron folic acid fortified food in public health programmes	Convergence with other ministries
Lactating Women	Addressing non-nutritional causes of anemia in endemic pockets, with special focus on malaria, haemoglobinopathies and fluorosis	Anemia Mukt Bharat dashboard and digital Portal - one-stop shop for anemia

How far have we reached ?

There has been limited progress of nearly 1% reduction per annum between 2006-2016 across India. Ever since the inception of anaemia monitoring through NFHS survey, a declining trend was observed for all age groups in successive NFHS surveys up to NFHS-4 but a sudden rise in anaemia prevalence NFHS-5, prominently among under 5 year children. Anaemic adolescents, though a prominent group only reported in NFHS 4 & 5 surveys showed an increase of 2% for male and 5% for female in a period of half decade.

India has national target to bring down the anaemic prevalence to 40% in children, 36% and 11% in adolescent girls and boys respectively but had reached only half way to those targets. School age children (5-15yrs) found no place in in NFHS Survey even after two decades. 41% of pre school children, 24% of school age children and 28% of adolescents were found to be anaemic as per CNNS report.

Reasons for Increase in anaemia in NFHS-5

One of the possible reasons demonstrated in a study is the use of inappropriate diagnostic cut-off values for anaemia. Prevalence of anaemia in children (0-19 year) was 19.2% lower when study cut-offs (10.8%) were used in comparison to WHO cut-off values (13 %). As cutoffs defined by WHO were mostly based on White adult populations and there are enough studies pointing the variations in anaemia prevalence for different ethnicity.

Also, NFHS survey uses Capillary blood for onsite haemoglobin assessment using a portable analyser (Hemo cue Hb 201+) which overestimate the haemoglobin values when compared with the use of venous blood sample for same.

Another possible reason could be the effect of COVID pandemic on the health of people and a sense of fear (of contracting virus) that developed and it affected the surveyors and surveying methods used by them.

Prevalence of Anaemia in India and world

Since 2000, the global prevalence of anaemia in women of reproductive age has been stagnant, while the prevalence of anaemia in pregnant women has decreased slightly and the same can be said about the Indian women based on the NFHS reports as depicted in figure below. Situation of anaemia is better for pregnant women as compared to non- pregnant women in India, but global estimate of anaemia

Table 3 : Shifts in Anaemia prevalence in India

Age Group	% Decline in 10 yrs (2006- 2016)	NFHS -3 (2006)	NFHS - 4 (2016)	NFHS -5 (2019 - 21)	National target 2022 (reduce 3% p.a)*
Children (6–35 months) (Hb<11g/dl),%	—	79	—	—	—
Children (6–59 months) (Hb<11g/dl),%	11 (1.1 % p.a)	69	58	67	40
Adolescent girls (15–19 years) (Hb<12g/dl),%	2 (0.2% p.a)	56	54	59	36
Adolescent boys (15–19 years) (Hb<13g/dl),%	1 (0.1 % p.a)	30	29	31	11
Women of reproductive age (Hb<12g/dl),%	2 (0.2 % p.a)	55	53	57	35
Pregnant women (Hb<11g/dl),%	8 (0.8 % p.a)	58	50	52	32
Lactating Women (Hb<12g/dl),%	5 (0.5 % p.a)	63	58	57	40
*p.a - per annum					

	#Prevalence in World (2019)	Prevalence in India(NFHS-5)	(%difference)	Targets to Achieve by India	
				National target 2022 (of Poshan Abhiyan, India) [3]	Global Nutrition Target, 2025 (by WHO)[13]
Women of reproductive age	29.9%	57.0%	(-27.1)	35%	23%
Non-pregnant women of reproductive age	29.6%	57.2 %	(-27.6)		
Pregnant women	36.5%	52.2%	(-15.7)	32%	
# WHO, Global Anaemia estimates, 2021 Edition[10]					

prevalence are far better than in Indian women. India is lagging behind in terms of achieving its national targets of Anemia Mukt [* Object too big for pasting as inline graphic. | In-line.JPG *]Bharat Abhiyan under Poshan Abhiyan (2018).

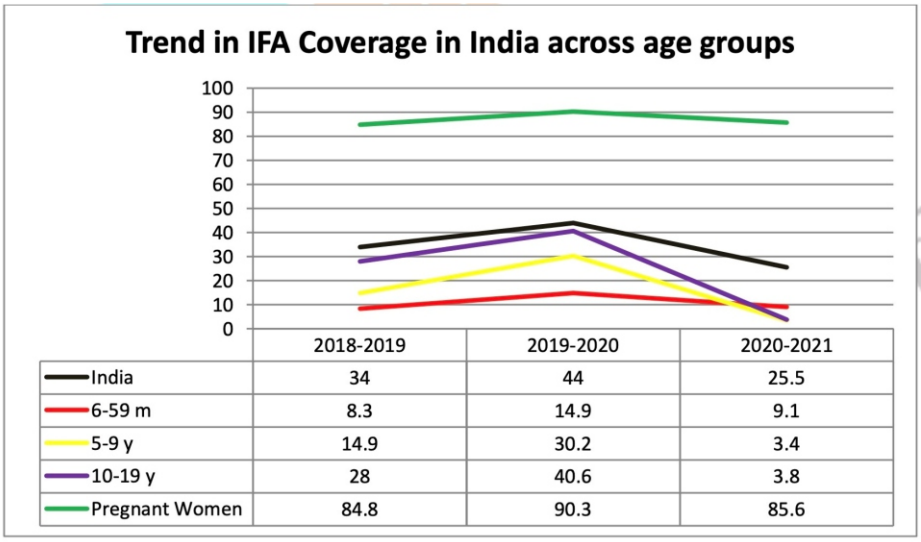
Trends in IFA Coverage

NFHS estimates suggest that the consumption of IFA tablets during pregnancy (at least for 100days) has increased from 30.3% in 2015– 16 to 44.1% in 2019–21.After the launch of AMB strategy, the Iron and Folic Acid (IFA) supplementation coverage between 2017–18 and 2019–20 has increased for all beneficiary groups .Under AMB IFA supplementation in pregnant and lactating mothers are provided with IFA red tablets whereas adolescent girls and boys in schools are provided with IFA blue tablets. Children aged 6– 59 months are provided IFA syrup while those aged 5–9 years are provided IFA pink tablets. Enteric coated tablets [* Object too big for pasting as inline graphic. | In-line.JPG *]have been changed to sugar coated tablets.

From the figure given above, we can interpret that the coverage is around 80% only for pregnant women, whereas it is not even close to 50% for other beneficiaries. If we observe the trend as given in the AMB Scorecards the mean value for India had risen to 44.0 (2019-20) from 34.0 (2018-19) had again dropped to an even below 25.5 (2020-2021).The downside curve can be assumed due to the nationwide lockdown due to pandemic of COVID-19.

Recommendations

- The burden of anaemia among women and children is very high. This requires a continuum of care approach with a greater focus on curbing anaemia prevalence during pregnancy and its transmission to the next generation.
- Iron and Folic Acid (IFA) supplementation efforts should be strengthened, particularly for the consumption of IFA tablets for 180 days or more. This will require improvements in both availability of IFA supplements across states and districts and more effective behaviour change communication to promote adherence to IFA tablet consumption.



	2018-2019	2019-2020	2020-2021
India	34	44	25.5
6-59 m	8.3	14.9	9.1
5-9 y	14.9	30.2	3.4
10-19 y	28	40.6	3.8
Pregnant Women	84.8	90.3	85.6

Source- anemiamuktbharat.info

- The practices adopted by the best-performing districts in Kerala should be examined to understand success in lower prevalence in the state. Similarly, the high burden of anaemia prevalence among certain districts should be reviewed to identify the nutritional and non-nutritional causes of anaemia.
- The highest burden of anaemia is concentrated in certain endemic regions of Bihar, Jharkhand, Gujarat, Uttar Pradesh and Chhattisgarh. This finding can be examined more comprehensively to understand the challenges of implementing the AMB strategy in the region and any needed policy actions.
- The extremely high burden of anaemia prevalence in Ladakh and selected districts of Jammu and Kashmir requires a priority focus for reviewing local dietary factors and IFA supplementation efforts for women and children.

Conclusion

I. For an accelerated reduction in anaemia, effective convergence of several governmental departments like health, education, water supply and sanitation is needed. In addition, the other focus actions of the AMB mission require acceleration, as do the social determinants of anemia

II. More concerted efforts are required to promote dietary diversity, availability of iron-rich fruits and vegetables at affordable cost throughout the year, so as to utilize food based approach along with an intensified year-round behavior change communication campaign to bring about a sustainable change.

III. Ensuring delayed cord clamping and for mandatory testing of anemia using digital methods, functional digital haemoglobinometers be made available, with training of staff at the institutes of contact point.

IV. Also the funds allocated under Anemia Mukt Bharat Strategy (Rs.109 lakhs per district) by state government are required to be effectively utilized for management and treatment of anemia (MoHFW, 2018).

V. It is therefore urgent that implementation of strategies and laid down policies for the prevention and control of anemia to be made more robust.

Suggested readings

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Healing: A vital component of holistic health

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Introduction

The primary mission of health care is to facilitate healing. People often associate healing only with "cure," but it is much broader. A clinician heals when she reassures a patient that a symptom does not signal a feared health condition. A treatment heals when it mitigates pain and slows progression of disease. Healing even occurs when a very sick patient dies at home surrounded by family instead of in a hospital attached to machines. Each unique instance of healing represents a physical and emotional journey through difficulty, toward contentment and even peace. Healing, the process of restoring balance and well-being to the body, mind, and spirit, has been a subject of interest and investigation across various cultures and disciplines throughout history. While healing practices have evolved over time, modern scientific research has provided valuable insights into the mechanisms and benefits of healing interventions. This article explores the scientific literature on healing and its profound implications for health and well-being.

Healing Modalities and Their Effects on Health

1. Mind-Body Interventions

Mind-body interventions encompass a wide range of practices that involve the integration of mental, emotional, and physical processes to promote healing. Examples include mindfulness meditation, yoga, tai chi, and biofeedback. Scientific studies have demonstrated the beneficial effects of mind-body interventions on various aspects of health, including stress reduction, pain management, immune function, and mental well-being.[1,2] These practices often involve techniques such as deep breathing, relaxation, and focused attention, which can induce physiological changes associated with relaxation response and promote self-regulation of the nervous system.

2. Energy-Based Therapies

Energy-based therapies are healing modalities that work with the body's energy fields to promote balance and facilitate healing. Examples include acupuncture, Reiki, therapeutic touch, and Qigong. While the mechanisms underlying these therapies are not fully understood, emerging evidence suggests that they may influence various physiological processes, including pain modulation, inflammation reduction, and stress reduction.[3] Acupuncture, for example, has been shown to stimulate the release of endorphins and neurotransmitters, leading to pain relief and improved mood.[4] Similarly, Reiki and therapeutic touch involve the channelling of energy to promote relaxation and support the body's innate healing mechanisms.

3. Herbal Medicine and Nutritional Interventions

Herbal medicine and nutritional interventions involve the use of botanicals, supplements, and dietary modifications to promote health and healing. Scientific research has identified numerous bioactive compounds in plants and foods that exhibit therapeutic properties, including anti-inflammatory, antioxidant, and immune-modulating effects.[5] For example, curcumin, a compound found in turmeric, has been shown to possess anti-inflammatory and neuroprotective properties, while omega-3 fatty acids found in fish oil have been associated with cardiovascular health and cognitive function.[6] Integrating herbal medicine and nutritional interventions into healthcare protocols can complement conventional treatments and

support the body's healing processes.

4. Psychosocial Support and Therapeutic Relationships

Psychosocial support and therapeutic relationships play a crucial role in facilitating healing and promoting well-being. Research has consistently demonstrated the beneficial effects of social support, empathy, and compassionate care on health outcomes, including faster recovery from illness, reduced pain perception, and improved quality of life.[7,8] Therapeutic relationships characterized by trust, respect, and collaboration between healthcare providers and patients are essential for optimizing treatment outcomes and promoting patient-centred care.

Conclusion

The scientific literature on healing encompasses a diverse array of modalities and approaches aimed at promoting health and well-being. From mind-body interventions and energy-based therapies to herbal medicine and psychosocial support, a growing body of evidence supports the efficacy and benefits of various healing practices. By integrating these modalities into healthcare protocols and fostering holistic approaches to healing, clinicians and practitioners can optimize treatment outcomes, enhance patient satisfaction, and promote overall health and well-being.

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JOURNAL SCAN

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Prediction of Placenta Previa from Serial Reading of Serum Human Chorionic Gonadotropin Late in the First Half of Pregnancy

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J Obstet Gynaecol India. 2024 Feb;74(1):27-30.

BACKGROUND: Abnormally sited placenta is considered a major life-threatening condition for pregnant woman, and many debate about the way of early diagnosis and management to decrease the mortality and morbidity.

AIM OF STUDY: To evaluate the role of beta-human chorionic gonadotrophin (B-HCG) level in the first half of pregnancy as a marker for prediction of placenta previa.

STUDY DESIGN: This is a prospective study done in Al-Yarmouk Teaching Hospital from first of January 2020 till first of January 2021.

MATERIAL AND METHODS: A total of 57 patients have been recruited. For all participated women in this study were sampled between 14 and 18 weeks of gestational age for serum human chorionic gonadotropins measured in international units. Patients who developed placenta previa were diagnosed on the basis of development of vaginal bleeding either late in the second trimester or early in the second trimester. After developing vaginal bleeding, all patients were sent for routine ultrasound scan to confirm the presence of placenta previa.

RESULT: After recruiting a total of 57 women among which 14 patients were found to have placenta previa, ANOVA test shows a statistically significant difference between women with normal placenta and women with placenta previa P value < 0.001. Receiver operator characteristics curve was constructed to evaluate the optimum cutoff value for serum HCG between normal women and women with placenta previa sampled at 14–18 weeks of gestation. The optimum cutoff value is mean serum HCG > 105,380 IU in 14 weeks of gestation, and the sensitivity and specificity were calculated as 100% and 72.2%, respectively.

CONCLUSION: B-HCG level in first half of pregnancy can be used as a predictor marker for placenta previa.

AUTHOR COMMENTS : New research revealed an important role of HCG in the implantation process. HCG metabolically affects the decidua and leads to endometrial receptivity. The traditional simple method for the diagnosis of placenta previa in addition to the clinical presentation of painless vaginal bleeding was the ultrasound (Uls) which can be either transvaginal, transabdominl or translabial. Transvaginal Uls is much more accurate than transabdominal Uls, and it is safe. Sixty percent of women who undergo transabdominal sonography (TAS) may have another classification of placental site when TVS is done for them. Posterior placenta is poorly visualized by TVS. Many factors play a role in the accuracy of Uls like the presenting part that may interfere with the visualization of the lower segment, and whether bladder is filled or not, obesity also interferes with accuracy. Magnetic resonance imaging (MRI) can diagnose placental site accurately and better than TAS. But with no other benefit over TVS for placental site detection, MRI is not readily available in most hospitals. Placental trophoblastic tissue is the main source of HCG in normal pregnancy and is responsible for the persistence of corpus luteum of pregnancy which supports the pregnancy through its hormonal secretion in early first trimester. When the level of HCG was lower than normal, this may predict a complication in the pregnancy: miscarriage, extrauterine pregnancy

and fetal demise. HCG level may differ markedly among individuals and from one to next pregnancy in the same person. However, HCG levels had an ideal range within a normal pregnancy. Many studies try to correlate between B-HCG and abnormal placentation, especially placenta accreta. The exact cause of placenta praevia is not clear till now, but it is hypothesized to be related to abnormal vascularization of the endometrium caused by scarring or fibrosis from previous trauma, surgery or infection. Therefore this study emphasises on easily available markers for prediction of placenta previa in early pregnancy.

Efficacy of Ethanol Sclerotherapy Versus Laparoscopic Excision in the Treatment of Ovarian Endometrioma

Samaneh Mohtashami, Masoome Jabarpour, Ashraf Aleyasin , Marzieh Aghahosseini

J Obstet Gynaecol India. 2024 Feb;74(1):60-66. doi: 10.1007/s13224-023-01840-1.

OBJECTIVE: The purpose of this study was to examine the recurrence rates of ovarian endometrioma, dysmenorrhea, dyspareunia, and related complications between sclerotherapy and laparoscopic ovarian cystectomy in individuals aged 25 to 38.

METHODS: Eighty-eight women participated in this retrospective, single-center study between January 2020 and February 2022. Patients received either laparoscopy or sclerotherapy, depending on the opinion of the pertinent physician. In this study, the following parameters were retrospectively analyzed in follow-up visits 2, 6 and 12 months after sclerotherapy and laparoscopy: dysmenorrhea and dyspareunia by visual analog scale, complications following the intervention, and serial pelvic sonograms for endometrioma cyst recurrence. Moreover, serum Anti-Müllerian hormone (AMH) level before and 6 months after sclerotherapy/surgery were analyzed. The collected data were then analyzed using R software.

RESULTS: The results demonstrate the efficiency of both sclerotherapy and laparoscopic techniques in reducing endometrioma- related dysmenorrhea and dyspareunia over a 12-month period. There was no statistically significant difference in the occurrence of complications and recurrence rate between these two therapies, and both are equally beneficial. Also, the rate of AMH decline after laparoscopy was higher than sclerotherapy; however there was not a statistically significant change in serum level of AMH in laparoscopy compared to the sclerotherapy after 6 months.

CONCLUSION: Considering all the data, it appears that sclerotherapy, with its lower cost, shorter hospital stay, and quicker return to activities, can be a laparoscopic alternative to endometrioma cyst removal. More studies are required.

AUTHOR COMMENTS. Endometriosis patients who also have ovarian endometrioma (OMA) make up 17 to 44% of all patients with endometriosis. According to the updated American Society for Reproductive Medicine (ASRM) classification, OMAs are found in patients with advanced disease stages ; nonetheless, their cause and management remain controversial. Regardless of its size, endometrioma can cause ovarian injury by mechanical straining. As it contains inflammatory factors, proteolytic enzymes, and degrading agents, its substance induces metaplasia and fibrosis and lowers the number of cortical-specific stromal cells. Despite the considerable frequency of endometriosis, gynecologists have always debated a treatment that could increase fertility, relieve pain, and prevent the disease's recurrence. Laparoscopic cystectomy is the treatment of choice for endometriomas, with documented recurrence rates ranging from 5 to 66.7%. However, the loss of neighbouring healthy ovarian tissue by ovarian cystectomy may result in a diminished ovarian reserve. It's also been found that 2.6% of women experience premature ovarian failure and menopause after undergoing bilateral

ovarian cystectomy (to remove an endometrioma. Other less invasive methods must be developed in order to avoid postoperative complications and minimize the impact on fertility. Ethanol sclerotherapy is an alternate method for preserving ovarian reserve. Sclerotherapy with ethanol has been used in various organs for a long (such as thyroid, liver, kidney, and spleen). This minimally invasive method removed the cyst by disrupting the epithelial lining of the cyst, resulting in inflammation and fibrosis. Sclerotherapy following aspiration was found to be more effective than aspiration alone in terms of recurrence (8 to 14.9 percent and 83.3 percent, respectively). The reported recurrence rates following sclerotherapy, after 12 to 24 months of follow-up, vary from 0 to 62.5%, depending on the procedure employed. This conservative approach may be effective in alleviating symptoms while also saving money

Each strategy offers benefits and drawbacks that can be utilized based on the patient's situation. The purpose of this retrospective study was to investigate the degree of pain (dysmenorrhea and dyspareunia), the rate of recurrence of OMA, serum AMH level and related complications following sclerotherapy vs. laparoscopic ovarian cystectomy in patients aged 25–38 years. Overall, this study provides cheaper, easily available and less painful method for treatment of ovarian endometrioma.

नई AOGD टीम को शुभकामनाएँ

उन बुलंदियों को पाना अब नहीं नामुमकिन
जब भेजा है खुदा ने हमें जरिया बनाके
जरूरत है तो सिर्फ एक हौसला अफजाई की
फिक्र क्या अगर चुभेंगे शूल अब दामन में
लक्ष्य हो कितना भी लंबा या दूर
नहीं डरते मुश्किलों से ये शूरवीर
बस साथ चाहिए उन हमजोलियों का इन्हें
जो कदम से कदम मिलाकर कर दें दूरियाँ दूर

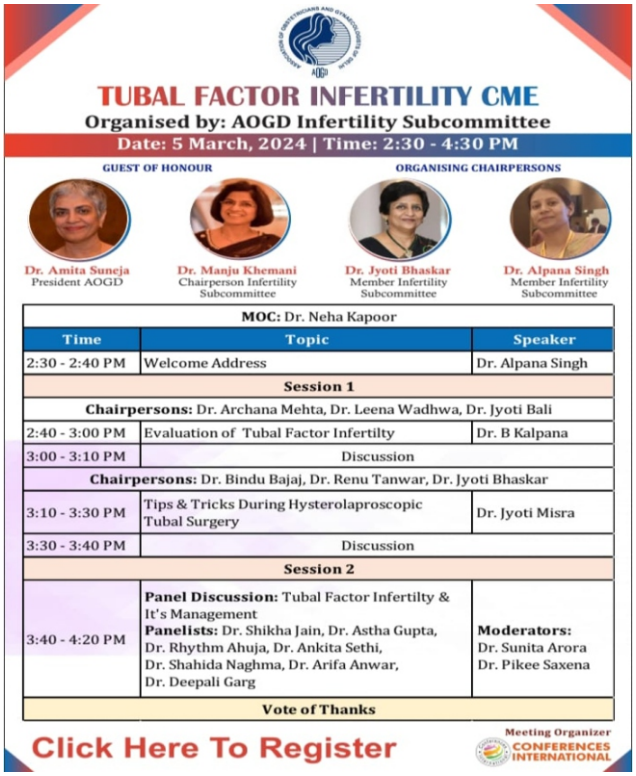
डॉ नीरजा गोयल

EVENTS HELD

1.The Infertility Subcommittee of AOGD organised a very interesting and informative webinar on a topic...Tubal Factor Infertility on 5 th March 2024 from.2.30 to 4.30 pm.

Dr. Jyoti Bhaskar

Dr. Alpana Singh



2.Session on LGBTQI organised by dept of OBG , UCMS & GTBH , in collaboration with AOGD, Nazariya foundation and SAATHI on 8th March 2024 at LT- 1, UCMS.

3. AOGD and Delhi PG Forum organized a Case discussion on "Contraception in special circumstances "on 18th March 2024 at 7:00 - 8:30 pm.

4.AOGD Fetal medicine subcommittee webinar on 21/3/2024 under aegis of AOGD and Fetal medicine and Genetic clinic OBGYN Safdarjung Hospital

Time 5.30-7.30 pm

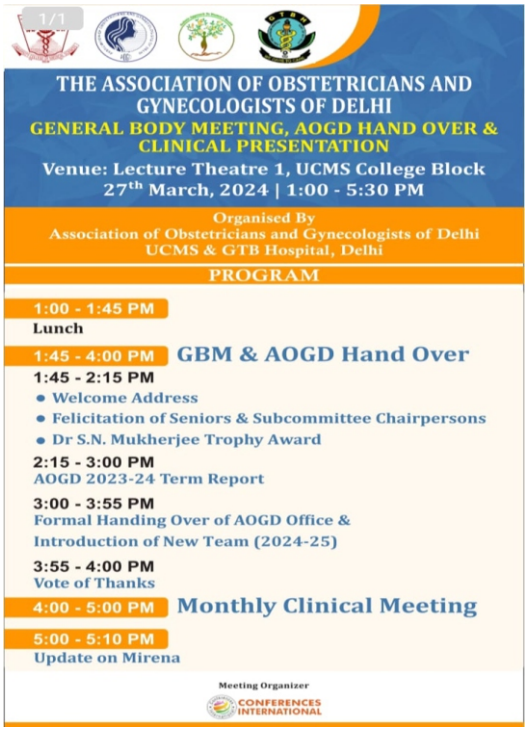
Chief Guest : Dr Amita Suneja

Organising Chairperson : Dr Sangeeta Gupta

Organising Secretary : Dr Sumitra Bachani

Topic: Approach to Fetal Thickened Nuchal in Obstetric Practice

5. AOGD monthly clinical meeting and GBM held offline on 27th March 2024 at 4-5pm and organized by UCMS & GTB Hospital, New Delhi.



6. AOGD Infertility and endocrinology subcommittee organised a CME on 28th March 2024 from 2.30 pm to 4 pm in hotel Eros Nehru place.

PROCEEDINGS OF MONTHLY CLINICAL MEETING

AOGD monthly Clinical Meeting held at UCMS & GTBH, New Delhi on 27th March, 2024

1.Clitoromegaly: A Reflection of Multifarious Disorders

Presenter: **Rashmi M, Shweta S**

Moderator: Amita S, Dhirender S, Nishant, Abha S, Sruthi B, Bindiya G

Background: Clitoromegaly is abnormally enlarged clitoris in females. Clitoromegaly occurs due to masculanization of female external genitalia and may be associated with varying degrees of labial fusion. There can be many causes for clitoromegaly including hormonal, non hormonal, pseudoclitoromegaly or idiopathic. When present since birth, it is due to Disorders of Sexual Differentiation (DSD) due to abnormal exposure to androgens in utero. DSDs are classified as per the karyotype. Two cases of adolescent girls who presented with clitoromegaly since birth are presented.

Case 1 was a 12 year old girl who had clitoromegaly since neonatal period. She had growth lag as compared to her peers. She had not attained puberty. On examination she was short statured with height < 3rd percentile. She did not have any breast development or axillary/pubic hair development. She had clitoromegaly with labial fusion. On investigations, she was found to have Sex Chromosome mosaichism (45,XO; 46,XY) with Mixed Gonadal Dysgenesis. She underwent bilateral gonadectomy followed by Reduction Clitoroplasty. Post operatively she was started on low dose estradiol.

Case 2 was a 16 years old female with enlarged clitoris since birth and now presented with primary amenorrhoea. She had normal development of secondary sexual characters and had normal height. She had hoarse voice. She had hyperpigmentation of palmer creases and hirsutism. Her external genitalia had clitoromegaly (length 30mm). Her Karyotype was 46,XX. On investigations she had markedly raised Serum Testosterone and 17 OH Progesterone and further diagnosed as Simple Virilizing Congenital Adrenal Hyperplasia. She was started on Tab Dexamethasone. After 6 months she had improvement in hoarse voice and hirsutism, but no change in clitoris. Reduction clitoroplasty was done. Post operatively she was started on Prednisolone to continue life long.

Mixed Gonadal Dysgenesis, Congenital Adrenal Hyperplasia and reduction clitoroplasty surgical procedure are discussed.

2. An Elusive Nipple: Think Out Of The Box

Presenter: **Bhanupriya**

Moderator: Anshuja Singla, Rachna Agarwal, Sandhya Jain, Seema Prakash, Upasana Verma

Background: Raynaud's phenomenon of the nipple is a possible diagnosis in lactating women with severe nipple pain. It is characterised by vasospasm of the arterioles causing intermittent ischaemia, which is manifested as pallor, followed by cyanosis as the venous blood is deoxygenated, and then erythema when reflex vasodilatation occurs. In absence of prominent clinical sign, women may wander from one clinician to another. Therefore, to educate primary healthcare workers about severe nipple pain, especially since prompt recognition and treatment allow mothers to continue breastfeeding.

Case report

We present a post operative day 10 mother who presented with severe nipple pain without any clinical signs of infection. She even received lactational counselling, emollients, antibiotics and antifungal treatment before presenting to our hospital. There was no such in history in the family but she herself experienced such pain before pregnancy and in third trimester. There was associated history of migraine with aura. Incidentally, she showed some pictures in her mobile which she was advised to take by the

lactation consultant and a triphasic colour change in the nipple was noted during pain episode which is characteristically found in Raynaud's phenomenon. As Raynaud's phenomenon may also be associated with secondary systemic connective tissue disorder, hence systemic organ screening with blood, urine investigations, chest X ray and complete autoimmune panel was done which all came out to be normal. Therefore, the final diagnosis of post partum nipple pain with primary Raynaud's phenomenon was made. Patient was advised warm compresses and breast feeding in the ambient temperature room. The pain reduced in terms of frequency and intensity over a period of 2 weeks. There was no need of pharmacotherapy (Calcium channel blocker) for the patient.

Conclusion: Our case emphasizes the awareness of gynaecologists & multidisciplinary approach to the case of Raynaud's phenomenon as a cause of nipple pain.

3. Even A Mundane Myoma Can Deceive : Beware

Presenter: **Seema Rawat, , Kalpana Kumari, Nidhi Kumari,**

Moderator: Richa Aggarwal, Balkesh Rathi, A.G. Radhika

Background: This case study illuminates the intricate diagnostic journey encountered in managing a uterine tumor, Uterine Tumors Resembling Ovarian Sex Cord Tumors (UTROSCT), whose presentation can belie their true nature, akin to commonplace myomas.

Case report: A 32-year-old woman presented with a year-long history of heavy menstrual bleeding, accompanied by weakness and palpitations. Initial evaluation suggested uterine fibroids with anaemia, prompting myomectomy after blood transfusion. However, subsequent histopathological and immunohistochemical analysis unveiled UTROSCT, underscoring the imperative for meticulous pathological scrutiny. After reviewing the literature, various treatment options were discussed with this patient and she opted for TAH with BSO as part of her further management, but to our surprise no tumor was left in the hysterectomy sample in final histopathology report.

Discussion: UTROSCT, a rare uterine mesenchymal neoplasm with low malignant potential, predominantly affecting women aged 30-60 years, oftentimes masquerading as leiomyomas, thereby posing diagnostic dilemmas. In light of the available literature, no pathognomonic clinical feature can be attributed to UTROSCT. Patients usually present with abnormal uterine bleeding, most commonly or pelvic discomfort, but 20% of them are asymptomatic. Imaging modalities provide limited diagnostic clarity, thereby emphasizing the paramountcy of histopathological and immunohistochemical analysis for precise characterization. Treatment typically entails surgery in the form of hysterectomy or local tumor excision, with considerations for fertility preservation in selected cases. Fertility-preserving initial treatment does not seem to worsen the prognosis. Poor response has been seen to various chemotherapy regimens, hormonal therapy and radiotherapy. Most patients who underwent hysterectomy progressed without recurrence. However, post-treatment follow-up is necessary, as some cases of recurrence or distant metastasis have occurred several years after treatment. Patients with UTROSCT generally experience a favorable prognosis, albeit necessitating vigilant long-term surveillance. Various research articles have suggested that aggressive cases (with extrauterine spread or recurrence) can be identified based on a distinct genetic and immunohistochemical phenotype. UTROSCTs characterized by GREB1::NCOA1-3 fusions and PD-L1 molecule expression appear to be predisposed to more aggressive behaviors and recurrence.

Conclusion: By elucidating the diagnostic intricacies surrounding UTROSCT, this case aims to enhance awareness amongst clinicians and pathologists, fostering a more nuanced approach to the evaluation and management of uterine tumors.

Handing over ceremony of AOGD Office to DR. RML HOSPITAL on 27.03.2024 at UCMS & GTB Hospital

AOGD General Body Meeting was held at Lecture theatre -1, first floor, UCMS College on 27th March 2024 from 1 pm to 4:00 pm. The meeting began with an address by AOGD president Dr Amita Suneja, followed by felicitation ceremony of our Patrons, Dr S.N. Mukherjee by Dr Kamal Buckshee and Dr Neera Agarwal. Dr Mukherjee, Dr Buckshee, Dr Agarwal, Dr Swaraj Batra, Dr Reva Tripathi and Dr Asmita then felicitated the Advisors and Subcommittee Chairpersons. Dr Neerja Bhatla, VP NZ, Dr Reva Tripathi, Chairperson Finance Committee, AOGD and Dr Anita Sabbarwal, President FOGSI were also felicitated for their notable contributions to AOGD. Dr S N Mukherjee Rotating Trophy, for the Best Clinical Meeting for the year 2022-23 was handed over to the winners ie Maulana Azad Medical College & LN Hospital by Dr S N Mukherjee. In her report for the year 2023-24, AOGD Secretary Dr A G Radhika provided an overview of the activities of the organization. As part of her presentation, she highlighted some of the major accomplishments of AOGD in the period 2023-2024.

Members of the AOGD were informed of important decisions approved by the AOGD Executive Council during the year 2023-24. GBM approved these decisions. Notable points were:

i. Set up a new AOGD Subcommittee, namely the Medicolegal Subcommittee

ii. A newly formed committee has been formed to formulate the terms and conditions for membership in subcommittees:

Chairperson Dr Reva Tripathi

Members Dr Manju Khimani
Dr Manju Puri
Dr Anjila Aneja
Dr Achla Batra

AOGD Financial report was presented by Treasurer, Dr Rashmi Malik for the year 2023-24.

AOGD office for the year 2024-25 was then formally handed over to Department of Obst &Gynae, ABVIMS & Dr RML Hospital, Delhi under the Presidentship of Dr Ashok Kumar.


Theatre 1, UCMS College Bloc
h, 2024 | 1:00 - 5:30 PM
Organised By
S & GTB Hospital,


THE ASSOCIATION OF OBSTETRICIANS AND
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GENERAL BODY MEETING, AOGD HAND OVER
CLINICAL PRESENTATION
Venue: Lecture Theatre 1, UCMS College Block
Mirena


THE ASSOCIATION OF OBSTETRICIANS AND
GYNECOLOGISTS OF DELHI
GENERAL BODY MEETING, AOGD HAND OVER
CLINICAL PRESENTATION
Venue: Lecture Theatre 1, UCMS College Block
Mirena

FORTHCOMING EVENTS

1. Next AOGD clinical meeting will be held in Lady Hardinge Medical College & Smt. Sucheta Kriplani Hospital on 19th April 2024.

INFORMATION

"We are pleased to share that 25 out of the 300 odd members with missing details have been contacted and their FOGSI membership rationalized.

We request that all members review the AOGD membership list on the website and notify immediately in case of any discrepancies or edits via e-mail to aogdrml2024@gmail.com or by phone to 9717392924."

Calendar of Virtual Monthly Clinical Meetings 2024

Date	Name of Institution
26th April, 2024	**LHMC & Smt. Sucheta Kriplani Hospital**
31st May, 2024	**B L Kapoor Hospital**

Announcement

In person meeting on 27th March at 1pm at Lecture Theatre 1, UCMS College Block. The programme includes Lunch followed by GBM, Felicitations and hand over office to the incumbent team

Dil Se

Dr Raj Guru Meena
Junior Resident OBGY
UCMS, Delhi

In the midst of blessing from grandparent's gaze,
Where cries of newborn echo into haze,
There sits a soul, in that postnatal ward,
Where her arms cradle emptiness, her heart is floored.

Amidst the coos and the tender lullabies,
She feels the weight of silent, sorrowful sighs.
For in her arms, there's no bundle of joy,
Just a void where dreams once danced, oh so coy.

Her tears mix with other's joyous streams,
As she navigates through shattered dreams.
A mother, yet mourning a loss so profound,
In a world where silence is the only sound.

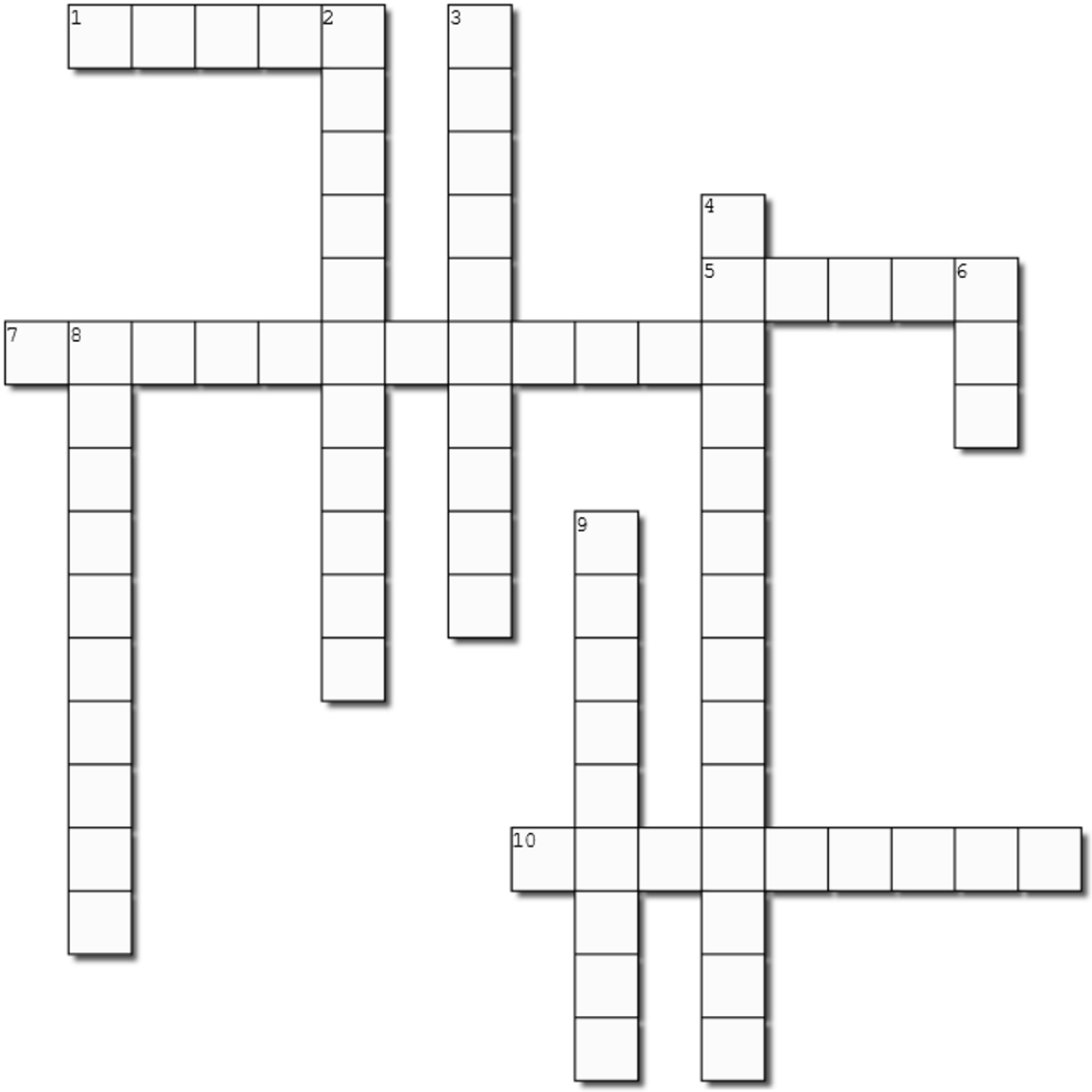
In the chorus of life's beginning, her heart has the note that's sore,
A song of grief amidst the newborns' roar.
Her pain, unseen amidst the jubilant cries,
A silent whisper beneath other's joyous skies.

But in her eyes, a strength does gleam,
For though her heart may ache, she still dares to dream.
For even in loss, there's love that stays,
In the quiet moments, in countless ways.

So let her tears flow, let her heartache be known,
For in acknowledging her pain, her spirit has grown.
In the midst of blessings, she finds her grace,
A mother's love, in the most tender embrace.

CROSS WORD

Bhanupriya



Across

1. Which sample is used to prepare PRP
5. Which AI tool is used for ploidy prediction in ART(acronym)
7. Isolated vaginal metastasis in GTN is treated by
10. Tdap vaccine has replaced TT due to additional advantage of protection against which disease

Down

2. The enzyme responsible for the removal of iodine from T4 molecules
3. Which cardiac drug on long term therapy causes hypothyroidism
4. The method to obtain platelet rich plasma preparation is
6. Delayed complications related to chemotherapy in GTN (acronym)
8. TPO antibodies were previously named as ————————-- antibodies
9. Apart from Tdap which other vaccine is recommended as per FOGSI

Blood ,Deiodinases, Amiodarone, Centrifugation, ERICA, AML, Embolization, Microsomal, Influenza,

AOGD Risk Management Support [ARMS] Group

One of the ways to ensure stress-free work environment and optimal patient care is mutual support among professional colleagues. An advisory group was set up last year so that they can be contacted if any of us is caught in a complex clinical dilemma / dealing with aggressive clients or is apprehensive about how to document or effectively troubleshoot a potential problem. The same group will continue to provide timely advice and is led by

Convener- Dr. Vijay Zutshi- 9818319110

Co convener- Dr. Aruna Nigam- 9868656051

We invite suggestions from all members regarding functioning of this cell which will guide us forming the SOPs. Pl mail to **aogd.ucmsgtbh2023@gmail.com**

AOGD Sub - Committee Chairpersons 2023-25			
Committee	Chairperson	Contact No	Email id
Adolescent Health Sub-Committee	Dr Jyoti Bhaskar	9711191648	jytbhaskar@yahoo.com
Endometriosis Sub-Committee	Dr Reena Yadav	9868996931	drreenalhmc@gmail.com
Endoscopy Sub-Committee	Dr Swati Agrawal	9810181964/ 9953938995	drswatilhmc@gmail.com
Fetal Medicine & Genetics Sub-Committee	Dr Sangeeta Gupta	8368199481/ 9968604349	drsangeetamamc@gmail.com
Oncology Sub-Committee	Dr Saritha Shamsunder	9313826748	shamsundersaritha@gmail.com
QI Obst & Gynae Practice Sub-Committee	Dr Kiran Aggarwal	9312277346	dr_kiranaggarwal@hotmail.com
Urogynaecology Sub-Committee	Dr Monika Gupta	9312796171	drmonikagupta@hotmail.com
AOGD Sub - Committee Chairpersons 2022-24			
Committee	Chairperson	Contact No	Email id
Breastand Cervical Cancer Awareness, Screening & Prevention sub-committee	Dr Mrinalini Mani	9911835888	drmrinal5@gmail.com
Infertility & Reproductive Endocrinology sub-committee	Dr Manju Khemani	9810611598	dr.manjukhemani@gmail.com
Community Health & Public Awareness sub-committee	Dr Shivani Agarwal	9868249464	dragarwal.shivani@gmail.com
Safe Motherhood sub-Committee	Dr Kiran Guleria	9811142329	kiranguleria@yahoo.co.in

Associaton of Obstetricians & Gynaecologists of Delhi

MEMBERSHIP FORM

Name:.....

Surname: .....

Qualification (year): .....

Postal Address: .....

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

Place of Working: .....

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

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

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

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

Member of Any Society:.....

Proposed by .....

Cheque/DD / No: .....

Cheque/Demand Draft should be drawn in favour of**: AOGD 2023**

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Account no: 110112345909
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MICR code: 110015088

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For Old Renewal Membership+ : Rs. 1,200 + Rs. 216 (18% GST applicable) = Rs. 1,416

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

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

+ - In case of renewal, menton old membership number. Note: 18% GST will be applicable as FOGSI requires it.

Send Complete Membership Form Along With Cheque / DD and Photocopy of required documents.

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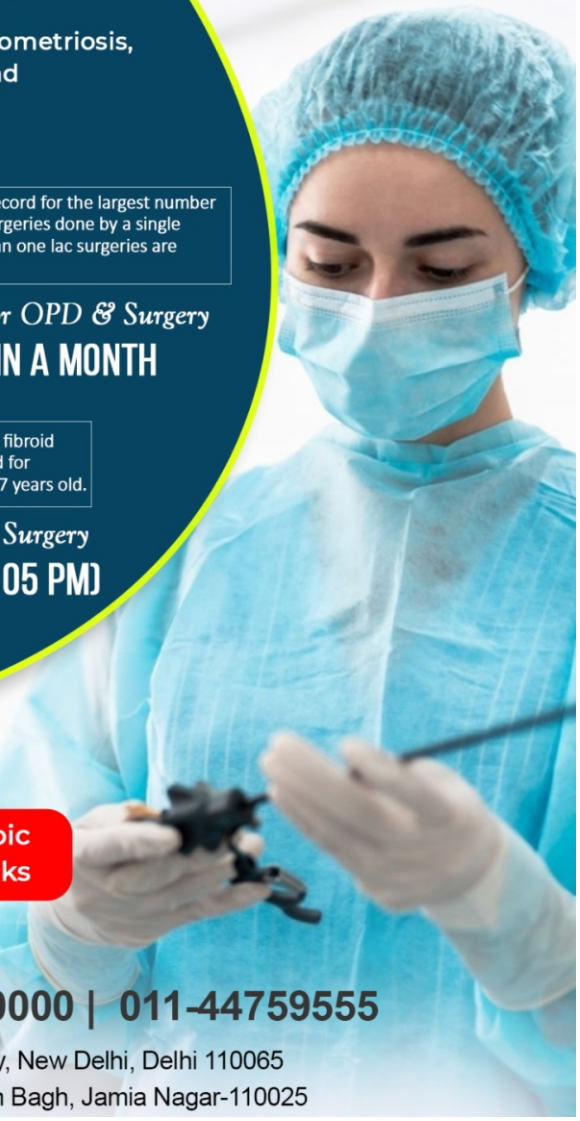

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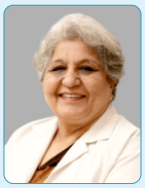

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