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MESSAGE FROM THE PRESIDENT’S DESK

Dear Friends

This issue of IFS conversation covers various interesting topics like endometrial receptivity assay, freeze all, non invasive PGT and PGT for low ovarian reserve, dual trigger for oocyte maturation, social egg freezing and role of stem cells in fertility etc.

IFS conversation is not only a showcase of recent academic activities but also covers various academic topics encompassing fertility treatments and diagnostics with all the practical tips, which will be beneficial for practising fertility specialists.

I also extend my invitation for our forth coming annual congress Fertivision 2019 to be held between 6-8th December 2019. No congress is complete without whole hearted participation and contribution. We have tried our best to have a plethora of eminent speakers from all across the globe. The conference topics are well chosen keeping in mind the advances in the field to improve fertility treatment outcomes. We hope each one of us goes back richer in knowledge at the end of this academic bonanza.

With Best wishes

Dr M. Gouri Devi

IFS SPECIAL INTEREST GROUP (SIG 2018 - 2020)

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<td>DR S.N.BASU</td>
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<td>DR ALKA KRIPLANI</td>
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<td>DR JAYANT MEHTA</td>
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<td>Co Convenor               : Dr Manisha Bajpai</td>
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MESSAGE FROM THE SECRETARY’S DESK

DR (PROF) PANKAJ TALWAR
Secretary General - IFS

Dear Friends,

IFS conversation is an interesting platform to receive all the updates on IFS activities. It gives me immense pleasure to announce release of our latest update covering various topics like endometrial receptivity assay, freeze all, non invasive PGT, dual trigger for oocyte maturation and role of stem cells in fertility etc.

We have reached the end of the year and are eagerly awaiting out annual congress Fertivision 2019 which will be held between 6th - 8th December 2019 at Leela Ambience, Gurugram. We extend our invitation and would be thrilled to host everyone. It will be an academic feast covering ten precongress workshops and followed by two day main congress. There is a galaxy of international and national speakers and you can get enlightened by their vast knowledge. The congress would also entail various post congress cultural entertainment program.

We hope you are updated and enriched with IFS activities through this issue of IFS conversation. We would encourage our readers to further give their academic contributions to forthcoming IFS conversation editions.

Dr (Prof) Pankaj Talwar

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WHY TO JOIN IFS
IFS is a Multi-disciplinary Society that unites the legal and scientific professionals in the scope of Reproductive Medicine

IFS MEMBERSHIP BENEFITS AT A GLANCE

- Fertility Society
- Collaboration with ESME & IPS
- 2018 Members & 9 Chapters
- National Conference Publication annually with national registration fees for papers presented
- Special Interest Group (SIG) for Practice-based research and interventions
- Research Wing of IFS has its own official magazine for Research Project approval
- Publication Wing - Fertility Science & Research Journal
- Fertility Scholarships to selected IFS members in collaboration with Asta University
- IFS Certified Endoscopic Examination in India, conducted by IFS every year
- IFS Online activities all year round

IFS Membership

Free access to IFS E-Newsletter contents and Official Journal

IFS E-Newsletters - IFS Conversations - Indian Fertility News - IFS World

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Offline Registration Form

Download the form and send to the secretariat with recent pax and cheques/draft

IFS Conversations (Volume : 10)

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INDIAN FERTILITY SOCIETY

Online Registration Process

STEP 1: Open IFS website
STEP 2: Click on Online membership registration button
STEP 3: Fill all the details
STEP 4: Please note your registration form. Then click on pay now button
STEP 5: Select your preferred payment method
STEP 6: Fill the card details and click on pay now button
STEP 7: After successful payment you will get a confirmation email on your registered email id
STEP 8: Within 48 hours you will get the Membership no. and Member tag on airmail sent on your registered email id

Note:
- For any help or queries regarding payment please email to support@astu.ac.in
- If any cash to be transferred, please contact bank manager, please email in all such cases to support@astu.ac.in

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Website: www.astu.ac.in

India

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Message from the Secretary’s Desk

Dr (Prof) Pankaj Talwar
Secretary General - IFS
Dear Members,

Greeting from team IFS!

This issue of IFS Vision brings us “Innovations and Controversies in ART”. It discusses new innovations with their controversies like ERA, non invasive PGS, Stem cells, Dual trigger, and Social egg freezing. The issue also debates controversies on PGS in low ovarian reserve, Blast for all, Double vs single IUI, IUI in unilateral tubal blockage, Freezing all embryos with transfer in next cycle and DNA fragmentation test and its impact on decision making. We have hoped to address some important controversies and evidence for and against it.

This issue coincides with our annual conference - Fertivision. The annual academic event of our society which gets together global and national leaders in the field of ART. We are looking forward to more debates, discussions, evidence and experienced based sharing of data on this single platform and we hope to see you as part of this academic bonanza.

IFS being a society rich in academics, it has held numerous CME, focused meetings, workshops, round table meets country wide in 2019. The fellowship program in ART and embryology are running successfully. The journal published by IFS - Fertility Science and Research is biannual and we invite contribution from members.

In 2019 IFS has expanded to 27 chapters distributed all over the country with over 2700 members. The theme - “Reaching the Outreach” has been truly fulfilled with members increasing in every corner of the country. Here, we would like to specially acknowledge our chapter secretary at Kashmir, Dr Sayed SajjadHussain for his special efforts to comply with our request for an article in this issue, with limited internet connectivity. IFS stands united at all fronts!

We wish you a merry Christmas and a happy 2020!

Dr Surveen Ghumman

Dr Shweta Mittal Gupta
**ASKING THE EXPERTS**

**Selecting The Best Embryo**

**Dr Kuldeep Jain**
Past President, IFS
Chairperson, International exchange committee, IFS
Editor, Fertility Science and Research
Director, KI JFV and laparoscopy centre Delhi
Program Director, Asian - KI JFV, Faridabad

In my view, an embryo which results in a healthy live pregnancy can be termed a good embryo. This is logical but not applicable to clinical scenario. So, every lab needs to develop their own criteria to select the best embryos for transfer. There are many methods which can help in selecting the best embryo but selection of embryos based on morphology is still the core of daily laboratory practice. Various methods which have been used and suggested are morphological assessment and time lapse technology. Other technologies which are not practiced widely are

- Pyruvate, Lactate, Glucose or AA levels in embryo culture media
- Assessment of oxygen consumption by embryo
- Genomic and proteomic profiling
- Assessment of embryonic metabolome

A multivariable prediction model to rank embryos according to their implantation potential has been suggested. This model is based on sequential morphological assessment to predict implantation potential of the embryo. Five factors included in the final prediction model are: early cleavage, number of blastomeres on days 2 and 3, morphological score and presence of morula on day 3.

Our routine selection is still based on Cleavage rates and Morphology. Faster cleavage is better. Morphological appearance: Based on the consensus, following is the ideal timing of observation of fertilized oocytes and embryos, and expected stage of development at each time point.

<table>
<thead>
<tr>
<th>Type of Timing</th>
<th>Timing (hours post insemination)</th>
<th>Expected Stage</th>
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<tbody>
<tr>
<td>Fertilization check</td>
<td>±1</td>
<td>Pronuclear stage</td>
</tr>
<tr>
<td>Syngamy check</td>
<td>±3</td>
<td>2-cell stage</td>
</tr>
<tr>
<td>Early cleavage check</td>
<td>26±1 post-ICSI, 28±1 h post IVF</td>
<td>2-cell stage</td>
</tr>
<tr>
<td>Day 2 embryo assessment</td>
<td>44±1</td>
<td>4-cell stage</td>
</tr>
<tr>
<td>Day 3 embryo assessment</td>
<td>68±1</td>
<td>8-cell stage</td>
</tr>
<tr>
<td>Day 4 embryo assessment</td>
<td>92±2</td>
<td>Morula</td>
</tr>
<tr>
<td>Day 5 embryo assessment</td>
<td>116±2</td>
<td>Blastocyst</td>
</tr>
</tbody>
</table>

Following are important indicators of best quality embryos.

- Cell number should be appropriate to the age of the embryo (in hours post-insemination)
- Both slow and fast embryos have reduced implantation potential and are abnormal
- The degree of fragmentation of an embryo is strongly correlated with chromosomal mosaicism and embryos that display fragmentation are less likely to implant and subsequent analysis
- Polarization of NPB in both pronuclei is a reliable marker of implantation; However, Pronuclear morphology assessment improves embryo selection only when it is combined with embryo morphology evaluation on day 3
- Blastocyst culture is not a means for improving embryo quality. It is simply a tool for selecting the best embryo

**Limitations:**

- Subjectivity
- Time pressure
- Inability to accurately estimate the reproductive potential of embryo.
- Assessment Problems
  - Fragmentation
  - Blastomere size
  - Multi-nucleation

**Selecting the best embryo morphology by sequential embryo assessment**

- 18-19 Hr- Post insemination
- 25-26 Hr- Post insemination
- 42-44 Hr- Post insemination
- 66-68 Hr- Post insemination
- 106-108 Hr- Post insemination

**What is Ideal? - Sequential embryo scoring system**

+ Zygote – 2pn score
+ Early Cleavage – 24h PI
+ Day 2 embryo score
+ Day 3 embryo score
+ Blastocyst score

- Minimal time in suboptimal environment
- The New and exciting powerful tool - sequential embryo assessment.
- Gives information about development parameters that differs between implanting and non-implanting potential.

Multi nucleation defined as presence of more than one nucleus in a blastomere (including micronuclei) and is associated with reduced implantation potential, increased risk of chromosomal abnormality andmiscarriage

Assessment should be performed on day 2 at 44 + 1 hpi
Grading is binary: present or absent

**A grade:**

+ fully compacted with all blastomeres compacting
+ cell boundaries not clear; some nuclei can be identified

**B grade:**

+ more than three-quarters of blastomeres compacting
+ spherical shape with a smooth profile

**C grade:**

+ irregular morphology with a deep indentation
+ less than 50% of the blastomeres compacting
+ fragments/non-compact blastomeres identifiable

**TABLE 1:** Consensus scoring system for day 4 embryos

**How useful is embryoscope in routine clinical practice?**

Embryoscope is one of the most technologically advanced and innovative devices. It integrates a multi-gas incubator, a microscope with an integrated camera shooting continuous image and an advanced software for the acquisition and subsequent analysis of all data relating to the development of embryos. It operates in a completely safe and non-invasive manner. Time lapse video analysis provides precise division kinetics of cultured embryos which correlates with blastocyst formation and quality. It is very useful in training new embryologists. Embryoscope however the utility of the embryoscope in clinical practice still remains to be proven. It is extremely expensive and is very unlikely to provide cost-effective use in clinical practice today.

There is a need of a software based on a multivariate analysis of information from images recorded by all the centers that use the Embryoscope to create a predictive algorithm, which will provide the embryologist with further and useful indications to choose the embryo to implant.

Following is the time line for checkpoint using embryoscope morphokinetics based on algorithm developed.

**Embryo Dynamics – Embryoscope**

<table>
<thead>
<tr>
<th>Mesegueret al., 201 Stage</th>
<th>Check-point (hpICSI)</th>
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<tr>
<td>22 - 25</td>
<td></td>
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<tr>
<td>1st Cleavage (2 Cells)</td>
<td>24.6 – 28.2</td>
</tr>
<tr>
<td>2nd Cleavage (3 Cells)</td>
<td>35.6 – 40.5</td>
</tr>
<tr>
<td>3rd Cleavage (4 Cells)</td>
<td>36.0 – 41.6</td>
</tr>
<tr>
<td>Clevage Dynamics (2 to 3 Cells)</td>
<td>&lt;12 h</td>
</tr>
<tr>
<td>Clevage Dynamics (3 to 4 cells)</td>
<td>&lt;0.67 h</td>
</tr>
<tr>
<td>Five Cells</td>
<td>49.6 – 56.7</td>
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**Non-invasive Quantification of Utilization & Metabolome**

Techniques such as metabolomics / PGS may help in selecting best embryo and moving towards SET but there routine use requires to be substantiated by RCT’s. Additional methods for embryo selection, such as selection based on chromosomal status (preimplantation genetic screening) and metabolomic profiles of culture media, have been introduced, but upon proper evaluation these methods have been shown to be unable to increase pregnancy rates.

**Genetic markers**

- PGS
- polar body analysis
- Morphokinetics
- time-lapse
- Biochemical markers
- amino acid profiling
- Infra-red spectroscopy
- PAF
- Respiration
- oxygen consumption
- pyruvate/glucose turnover

**Advantage**

- Without damaging the embryo
- Quickly
- Consistently and accurately

**Three approaches**

- Analysis of carbohydrate utilization
- Turnover of Amino acids
- Analysis of Embryo metabolism
- Promising but have limitation, cumbersome and need standardization

**So what is ideal method?**

**Combined approach**

- Currently used embryo assessment strategies are largely based on embryo morphology and cleavage rates. Their precision is a limiting factor.
- Sequential morphological assessment, may be with time lapse at designated time combined with glucose uptake and estimation of other metabolic products
- Sequential assessment is important in selecting process and data from time lapse and may prove beneficial in improving selection
- Need for an objective, fast, accurate and affordable test
WhO divided women with Ovulatory dysfunction into categorise the women who come to us for treatment. So, while we talk of the best embryo and the best sperm eludes us. hormone assays. Despite all this, 100% success still and the advances in diagnostic aids like ultrasound and a better understanding of the physiology of reproduction of its existence. This has primarily happened because of individualized treatment. hence came the concept of within these groups and that every woman required Over time we realized that there were many sub types categorizing the patient into one of the three groups.

IVF has been carried out using the Baird’s theory after “iCOS” – individualized controlled ovarian stimulation.

Hyper responders

These older women above age 35 years, maybe showing (Table 1) It was interesting to note that most of the 200 patients. The largest group was 1 which is alarming. In a recently concluded study carried out at our centre, we found the incidence of various groups in a total of 200 patients. The largest group was 1 which is alarming.

Fig 1: POSIEDON categorization of Poor Responder

Table 1

<table>
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<th>Group</th>
<th>POSIEDON (N=218)</th>
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<tr>
<td>Group 1</td>
<td>93 (42.6%)</td>
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<tr>
<td>Group 2</td>
<td>59 (27%)</td>
</tr>
<tr>
<td>Group 3</td>
<td>19 (8.7%)</td>
</tr>
<tr>
<td>Group 4</td>
<td>45 (20.6%)</td>
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In a recently concluded study carried out at our centre, we found the incidence of various groups in a total of 200 patients. The largest group was 1 which is alarming. (Table 1) It was interesting to note that most of the patients were those with an unexpected poor response whether they were young or old.

Group 1

These young normo gonadotropic women with normal ovarian reserve parameters, may be having an increased sensitivity to FSH hence will benefit by

- Increasing the starting dose of rFSH
- Adding 150 Ui r.LH to the rFSH.

Group 2

These older women above age 35 years, maybe showing a normal ovarian reserve but do not respond to normal stimulation. This is due to a fall in androgen production by theca cells as a result of age. This group will do well by pretreating with DHEAS or testosterone gel. Stimulation requires innovation so that the number of blastocysts produced are more in number. Hence, we may:

- Add 150 UI r.LH to 300 UI r.FSH from the beginning of stimulation
- Duo-stimulation: FSH +LPS to increase in the number of oocytes and therefore, euploid blastocysts

Conclusion

There have been major developments in the field of ovarian stimulation and despite a fair amount of fine tuning, we still are unable to accurately predict response and outcome in all our patients. Controlled ovarian stimulation still continues to be challenge in all the patients but more so in both hyper or hypo responders. It is important to strike a balance in order to give the best option for such patients then is to go in for donor oocytes.
ASKING THE EXPERTS

Embryo Transfer – The Best Technique

Prof. Sudha Prasad
President Elect - IFS
Director, Matritava Advanced IVF & Training Centre, Vasant Vihar, Delhi

Embryo transfer is the placement of an embryo into the uterus. A viable embryo, a receptive endometrium and an optimal embryo transfer technique are the prerequisite for the successful IVF procedures. Although embryo transfer is considered to be an easy procedure by most of the clinicians, but it is a very crucial stage which requires the skill. Hence a meticulous training and standard protocols for the procedure are desirable. If a standard embryo transfer protocol is followed the results will certainly increase.

Several variables play a role in the success of a transfer, including catheter type, atraumatic technique, and the use of ultrasound guidance. Because of the adverse effects of controlled ovarian hyperstimulation on the endometrium, frozen embryo transfers have demonstrated improved pregnancy rates.

Improvements in embryo culture, improved culture media have helped to grow viable blastocyst-stage embryos in vitro. The advent of successful methods of vitrification of blastocysts has facilitated storage of these embryos for later transfer without compromising viability. In addition, the evolving methods for embryo selection, which are noninvasive, seem to hold great promise for the future.

Variables which can affect ET success include the performance of a trial/mock transfer, and contamination of the catheter tip with blood, mucus, or endometrial tissue. The success rate are also affects if the embryos are retained or expelled. Important variable is to choose type of catheter, the volume and type of transfer media. It is very important to do cervical culture because the presence of bacteria in the cervix or on the catheter tip will directly hamper the implantation.

Placement of embryos is a skill and should be done as gently as possible to avoid any uterine contraction. Thus, avoiding difficult ET is important to optimize clinical outcomes, and ultrasound guided transfer definitely seems to be a key adjunct toward this goal. To avoid or minimize uterine contractility and to reduce the expulsion rates of embryos progesterone is to be started from the day of oocytes retrieval or in cases of frozen transfer, as a good triple line vascular endometrium is achieved.

There are several catheters available in the market which may be soft or stiff, pre-curved or straight. Soft and pre-curved catheters follow the contour of uterine cavity easily but may be difficult to introduce in tight cervical os, whereas as stiff one may be more traumatic which may lower the pregnancy rates. Hence, mock/trial transfer which mimics the actual transfer must be done few weeks before the ET irrespective of ultrasound guided transfers.

Flushing of cervix with culture media and removal of thick mucus plug is an important step before transfer. In a retrospective comparison, Tomás et al.1 evaluated 4,807 ETs with regard to the degree of difficulty. Easy or intermediate transfers resulted in a 1.7-fold higher pregnancy rate than difficult transfers (P<.0001; 95% confidence interval 1.3–2.2). Contamination with blood and mucus indicates difficult transfer and are associated with an increased risk for poor ET outcome.

The timing surrounding ET is also an interesting variable involved in success. After retrospective assessment of timings, Matorras et al.2 demonstrated that the interval between catheter loading and the transfer of the embryos into the uterine cavity affected IVF outcomes. When this delay was greater than 120 seconds, there was a decrease in pregnancy rates from 31.6% to 19.1% and a decrease in implantation rate from 15.9% to 9.4%. This may be related to how long the embryos are “outside the incubator.” The delay in injection might be a surrogate marker as well for the difficulty of ET. Therefore, minimizing the time between loading and transfer would seem to be important point to achieve better pregnancy rate.

To avoid the risk of multiple pregnancy it is advisable to do elective single embryo transfer (SET). Not more than two embryos are to be transferred in case SET is not done.

Another concern is amount of media taken in transfer catheter. Minimal the media (12 to 20 microliters), better the pregnancy rate. The position of the air bubble transferred at the time of ET and its relation to pregnancy rate is also important. More recently, it was demonstrated that pregnancy and implantation rates in relation with air bubble flashes located <15 mm from the fundus were significantly higher than those with embryo flashes located >15 mm from the fundus.

After transferring embryos, the catheter should be slowly withdrawn, maintaining pressure on the syringe plunger to avoid disrupting placement of the embryos/catheter contents.

After ET, bed rest has been a controversial subject, with some recommending extended bed rest and some virtually no bed rest. It has been suggested that it should be individualized for patients’ preferences and anxiety, anything more than a short period of bed rest is without proven benefit.

References

contaminants from the semen sample. This is why MACS separation is normally performed in conjunction with Density gradient centrifugation.

1. Selection of motile spermatozoon - Microfluorics

Microfluorics is the science and technology of accurate manipulation of small amounts of fluids, which is typically done in microchannels with dimensions of a few hundred micrometers. The principle of sperm selection by this method is laminar flow by gravity-driven pumps in the microchannels. Microfluidic sperm sorter selects sperm cells that had >80% improvement in DNA integrity relative to the heterogeneous population present in the raw semen, and the selection was performed in <20 minutes. This method bypasses centrifugation and thus lessens the amount of DNA damage in the resultant sample.

2. Selection based on live sperm morphology

a. Intracytoplasmic morphologically selected sperm injection, ICSI

Sperm evaluation at 400 magnification for ICSI is based on birefringence generated by the incidence of polarized light on longitudinally oriented protein filaments on the post-acrosomal region of the sperm. The proportion of birefringent sperm in a sample is correlated positively with sperm concentration, motility and viability. In addition, using this optical system, it is possible to differentiate acrosome-reacted from acrosome-intact sperm before microinjection.

b. Zeta potential method

Sperm cells can be selected based on their negative zeta electrokinetic potential which is the overall charge a spermatozoon acquires in a specific medium. A mature sperm cell has a negative zeta potential of -16 to -20 mV (differential potential between the sperm membrane and its surroundings).

3. Selection based on sperm membrane maturity - Hyaluronic acid sperm binding (PICSI)

The presence of HA binding sites on the sperm outer membrane is regarded as a sign of sperm maturity, and constitutes the basic principle for this assay. Hyaluronic acid, HA is immobilized from an acellular polyacrylamide culture dish and the washed sperm sample is allowed to interact with the HA coated surface for 15 min. An individual sperm attached to the dish is picked up with the ICSI pipette and used for oocyte injection. The device called PICSI (physiological intracytoplasmic sperm injection) uses a conventional polystyrene culture dish which the injected spermatozoon is selected by the technician at high magnification using MSOME normalcy criteria.

4. Sperm surface charge for sperm selection

There are two different approaches to select sperm based on the differential net electric charge on the sperm plasma membrane: electrophoretic system and zeta potential method.

a. Electrophoretic system

The electrophoresis-based technology uses an electric field to separate sperm cells based on size and electronegative charge. It is composed of four chambers: two outer chambers and two inner chambers (incubation and collection). The outer chambers (filled with buffer) house the platinum-coated titanium mesh electrodes. A membrane separates the outer chambers from the inner chambers allowing for the movement of small molecules, water and ions between them. The inner chambers comprise the incubation compartment and the collection compartment separated by a polycarbonate separation membrane whose pore size excludes leukocytes and other contaminants that normally contaminate semen samples. The semen specimen is loaded into the incubation chamber and allowed to equilibrate for 5 min before applying a current of 75 mA and variable voltage (18-21 V). The selected adherent subpopulation is recovered from the collection chamber after 5 min of application of the electric field.
Many clinicians have started freezing all embryos and transferring at another cycle. There are many advantages but it is still not established whether the advantages are for all sects of patients.

Advantages of freezing embryos
1. Better Endometrial Receptivity
2. Safety with Elimination of OHSS
3. Better Embryo-Endometrial Interaction
4. Better Pregnancy Outcome
5. Lesser Birth Defects
6. Lesser Ectopic Pregnancy
7. PGS/PGD

How does Superovulation affect endometrial receptivity?
- Superovulation affects the depth of the surface epithelium, the number and length of microvilli, and the mitotic activity in the surface epithelium and stromal cells
- Superovulation lowers the expression of specific integrins associated with the window of implantation
- Superovulation brings Premature appearance of endometrial nuclear channels systems, subnuclear vacuoles, pinopodes, and secretory changes
- Superovulation affects the timing of window of implantation More so in younger patients with high E2
- Endometrial advancement of >3 days is detrimental for Implantation

With Superovulation, A significant difference in gene expression which are known to be important in estrogen-mediated uterine growth and implantation and STC1, which has been shown to be important in angiogenesis is seen A difference in gene expression of >150 genes regulating angiogenesis and early implantation is seen with superovulation which is consistent with a 2–4 day acceleration in maturation and associated shift in the window of receptivity.

Table 1:

<table>
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<th>Gene expression profiles of simulated and nonstimulated human endometrium during the window of embryo implantation.</th>
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The advantages of freezing all embryos is established for OHSS and thin endometrium. To establish for all patients further studies are needed.

References

In Vitro Fertilization, Dr. Syed Sajjad Hussain
Director, MED AGE Infertility Centre
Srinagar, Kashmir

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In one study looking at all responders 40 years or older at the time of oocyte retrieval, the CPR was 62.4%, OPR was 60.0%, and clinical miscarriage rate was 15.3%. This compares to a miscarriage rate of 12.9% in women younger than 40 years (p=0.68), and also gives similar CPR and OPR (7). In a study by Rubio et al.8 involving women between the ages of 38-41 years, the authors reported that although more patients in the PGT-A arm had no transfer performed because of no euploid embryos being available, the PGT-A arm had a higher delivery rate per randomized patient (36 versus 21.9%). This improvement was because of a significantly higher pregnancy rate per transfer (52.9 versus 24.2%, P < 0.001) and a significant reduction in miscarriage (2.7 versus 39%, P < 0.001) in the PGT-A arm. As a result, despite more cycles being cancelled prior to embryo transfer, the time to ongoing pregnancy was significantly shorter in the PGT-A arm (7.7 versus 14.9 weeks).

The SOLAIRE study utilized AMH less than 1.1 or antral follicle count of less than 8 as inclusion criteria. This study also performed all embryo biopsies at the blastocyst stage unlike the Rubio study.9 The preliminary data demonstrated a 90-day reduction in the achievement of ongoing pregnancy in the PGT-A arm. There was also a trend toward reduction in clinical pregnancy losses.

Thus preliminary data conclude that, the true benefit of PGT-A in these patients is the avoidance of futile transfers and associated loss of time and emotional burden of miscarriage and ongoing aneuploid pregnancies.

Arguments against PGS

Despite many studies examining the clinical performance of patients with DOR or POR, there is still a lack of consensus regarding whether the poor IVF outcomes observed in these patients are solely the product of the inability to produce a sufficient number of oocytes to withstand the normal attrition seen at each stage of the ART process, or whether there is an additional qualitative penalty. In other words, does an oocyte derived from a poor responder also demonstrate reduced developmental potential or an increase in aneuploidy when compared to age-matched controls with better ovarian responsive-ness? It has been difficult to assess this since most studies about poor responders have not been adequately controlled for the confounding impact of age. It is important to see if these patients also exhibit evidence of an accelerated reduction in oocyte quality to understand the true impact of applying PGT-A to this group.

Without knowledge of how often an embryo diagnosed as aneuploid produces an ongoing gestation, it is difficult to make an informed decision regarding whether the benefits of PGT-A (avoidance of futile transfer, miscarriages, and associated lost time) are worth the risk of a false diagnosis of aneuploidy.

Studies have also demonstrated that different subpopulations of patients with low response exhibit different clinical characteristics and hence need to be looked at as separate subgroups.

The additional diagnostic categories of mosaicism and segmental imbalance and whether and which mosaic embryos can be transferred in the absence of euploid embryos in this group of patients with very few embryos, further complicate this issue and prospective, blinded data regarding the reproductive potential of such embryos is sorely needed.10

Poor responder patients may have very few embryos going to the blastocyst stage and adding a PGT-A to those may carry a risk of no transfer or the risk of wrong diagnosis of aneuploidy preventing a transfer. It is to be borne in mind that biopsy at blastocyst stage means fewer available embryos for transfer, particularly so among women of advanced age who may actually benefit amongst.

Application of PGT-A in all the poor responders runs the risk of no embryos being available for transfer, if the initial numbers are too low, and also if none of those few tested are reported to be euploid. However, a poor responder may still benefit from this by avoiding futile transfers with aneuploid embryos9 and expeditiously initiating numbers are too low, and also if none of those patients have a decreased risk for ongoing aneuploid gestations.6

Conclusion

Defining the role of PGT-A in ART for poor responders is slowly emerging. Early results suggest that utilizing aneuploidy screening improves efficiency in these patients by avoiding the time lost to futile transfers and associated miscarriages and ongoing aneuploid gestations. However, a complete assessment of the efficacy in this population will require a better understanding and more information is needed on characterizing the physiology of ovarian aging across multiple phenotypes of diminished ovarian reserve and establishing the predictive value of aneuploid results across multiple PGT-A platforms. However, initial data suggests benefit of PGT-A in poor responders.

References


3. Musset N, Kattner J, Perret S, et al. Pregnancy rate per transfer (52.9 versus 24.2%, P < 0.001) and a significant reduction in miscarriage (2.7 versus 39%, P < 0.001) in the PGT-A arm. As a result, despite more cycles being cancelled prior to embryo transfer, the time to ongoing pregnancy was significantly shorter in the PGT-A arm (7.7 versus 14.9 weeks).

4. Prematilage genetic testing for aneuploidy (PGT-A) has been demonstrated to improve implantation and pregnancy rates and decrease miscarriage rates over standard morphology-based embryo selection. However, there are limited data on its efficacy in patients with diminished ovarian reserve or a poor response to stimulation who may have fewer embryos to select amongst.

5. Despite consensus guidelines defining what constitutes DOR, there is still great debate regarding whether the low pregnancy rates observed in poor responders are simply a reflection of the quantitative challenge of starting with fewer oocytes, or if there is also a diminution in oocyte quality and an increase in aneuploidy.11 This is an important question in the context of PGT-A, because a young poor responder may have a different prognosis than an older poor responder.

6. Application of PGT-A in all the poor responders runs the risk of no embryos being available for transfer, if the initial numbers are too low, and also if none of those few tested are reported to be euploid. However, a poor responder may still benefit from this by avoiding futile transfers with aneuploid embryos5 and expeditiously initiating numbers are too low, and also if none of those patients have a decreased risk for ongoing aneuploid gestations.6

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Sperm DNA Fragmentation - Incorporating It In Infertility Practice

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Infertility is described as inability to establish pregnancy within 12 consecutive months of unprotected intercourse in couples of reproductive age. Among infertile couples around 20% contribute to male factor alone.

Conventional semen analysis till date has been considered as a cornerstone laboratory examination during evaluation of male infertility. When performed under strict guidelines and quality control this test can give information regarding male fertility potential. Also, one can find out radical forms of sperm dysfunctions like azoospermia or globozoospermia which has negative consequences on conception. An estimated 15% of men with normal basic semen analysis profiles have been associated with infertility. Various factors which cause male infertility includes varicoceles, oxidative stress, genetic abnormalities, systemic diseases, infections, altered lifestyle and exposure to xenobiotics. All these factors can influence Sperm DNA fragmentation which acts as potential mediator for establishing an infertility status in men. Many recent studies demonstrated that spermatozoal DNA integrity is a prerequisite for normal fertilization and transformation of paternal genetic information to the offspring. Also, reproductive timeline in men is one of the factors affecting sperm parameters.

In general semen volume, pH, sperm concentration, motility, vitality and morphology are determined according to WHO 2010 guidelines. But, it cannot accurately differentiate fertile from infertile men. Nearly 15% of infertile men have normal sperm parameters according to WHO 2010. This clearly indicates the presence of other subcellular and nuclear factors that have a major contributions towards male infertility that is not identified by conventional semen analysis.

Nuclear component of spermatozoa, especially DNA integrity, is essential for normal fertilization, implantation, pregnancy and fetal development. Within the last decade, infertility researchers have turned their attention to sperm molecular architecture for good reason—mamalian fertilization and subsequent embryo development depend in part on the inherent integrity of sperm DNA.

Sperm cell is different from other somatic cell at the expense of Cytoplasm and hence cell mass. Reduced cell mass means impaired production of enzymes required for genetic repair. Chromatin in somatic cells is a relatively loose structure but in sperm cell it is very tightly packed, Compacted, haploid genome which must adopt to a volume 40 times less than a somatic cell. The extremely tight complex structures formed by the interaction of spermatozoal DNA with proteins generate highly stable and transcriptionally inert chromatin. The replacement of the largest part of histones (85%) by transition proteins (TPs) and subsequently by protamines takes place during spermiogenesis and epididymal transit.

Etiology of DNA Fragmentation - it is multifactorial but this is best explained on the basis of three mechanisms; 1. Abnormal Chromatin/Remodeling. 2. Oxidative Stress. 3. Abortive Apoptosis.

Causes for Sperm DNA Fragmentation

Intrinsic Factors
• Remodelling and packaging problems.  
• Stage specific transient DNA Strand Breakage are introduced during Spermatogenesis. DNA breaks are needed for transient relief of torsional stress, favouring the Histones replacement with protamines during the final maturation from round to elongated spermatooza. These physiological, temporary breaks if not repaired leads to Sperm DNA fragmentation or genetic mutation in ejaculate. 
• Protamine deficiency or complete absence of it in some leads to defective packaging. 
• Damage by ROS-excessive reactive oxygen species (ROS) production and/or decreased seminal antioxidants. 
• Apoptotic events during sperm maturation within the epididymus.

Extrinsic Factors
• Chemotherapy. 
• Cigarette smoking. 
• Genital tract infection. 
• Testicular Hypothermia. 
• Varicoceles. 
• Advanced age. 
• Febrile illness.

Types of DNA Fragmentation

• Single Stranded Breaks (SSB)-due to unrepaired DNA nicks and ROS. 
• Double Stranded Breaks (DSB)- due to abortive apoptosis, gross alteration in chromosomal structure. This leads to more serious and deleterious effect development of pregnancy.

Effect on Reproductive outcome

Oocytes and early embryos have shown to repair DNA damage. Also fertilization is independent of DNA damage. Post fertilization development is affected by improper repair by oocyte. This leads to implantation failure, early miscarriages, and diseases in offspring.

Currently, there seems to be insufficient evidence to support the routine use of SDF in male factor evaluation. Nevertheless the importance of DNA fragmentation in spermatozoa has been acknowledged in the latest American Urological Association (AUA) and European Association of Urology (EAU) guidelines on male infertility(10). Although a precise understanding of the specific utility of such tests in different clinical scenarios is still lacking, studies defining specific indications for DNA testing are now emerging.

Diagnostic Tests

There are two types of assays that have been developed to measure SDF: Those that can directly measure the extent of DNA fragmentation through the use of probes and dyes and those that measure the susceptibility of DNA to denaturation, which occurs more commonly in fragmented DNA.

Below are the various diagnostic tests.

AO test: Metachromatic shift in fluorescence of AO when bound to single strand (ss) DNA. It works on principle of fluorescent microscopy. It is a rapid, simple and inexpensive but there are inter-laboratory variations and lack of reproducibility.

AB staining: There is increased affinity of AB dye to lose chromatin of sperm nucleus. It works on the principle of optical microscopy. It is rapid, simple and inexpensive but there is an inter-laboratory variations and lack of reproducibility.

CMA3 staining: CMA3 competitively binds to DNA indirectly visualizing pyrimidine deficient DNA. It works on the principle of fluorescent microscopy. It yields reliable results as it is used with other assays. There is an inter-observer variability.

TB staining: There is increased affinity of TB to sperm DNA phosphate residues. It works on the principle of optical microscopy. It is rapid, simple and inexpensive but there is inter-observer variability.

TUNEL: It quantifies the enzymatic incorporation of dUTP into DNA breaks. It can be done using both optical microscopy and fluorescent microscopy. It uses optical microscopy, fluorescent microscopy and flow cytometry. It is very sensitive, reliable with minimal inter-observer variability. This can be performed on few sperm. Although it requires standardization between laboratories.

SCSA: Measures the susceptibility of sperm DNA to denaturation. It is a cytomeric version of AO test. It works on the principle of flow cytometry. It gives the reliable estimate of the percentage of DNA damaged sperm. But requires the presence of expensive instrumentation (flow cytometer).

SCD or Halo test: This test assesses dispersion of DNA fragments after denaturation. It works on the principle of optical or fluorescent microscopy. It is a very simple test, but there is inter-observer variability.

SCGE or comet assay: This is electrophoretic assessment of DNA fragments of lysed DNA. It works on principle of fluorescent microscopy. This can be done in very low sperm count. It is sensitive and reproducible, but requires an experienced observer. There is inter-observer variability.

Clinical Utility

Most studies define upper normal level of percentage of cells with DNA fragmentation. Unit of measurement is DNA Fragmentation Index (DFI). Percentage of spermatozoa with fragmented DNA less than 15% is good fertility potential, 15-25%is average and more than 25% is poor fertility potential.

Advantages and Disadvantages

These assays do not differentiate between clinically significant or insignificant DNA damage. Some DNA nicks occur as a normal process during winding or unwinding of DNA and these analysis do not differentiate between physiological and pathological nicking. Assays do not evaluate genes that may be affected by the fragmentation, as fragmentation in area containing certain genes may be more detrimental than area in relatively inactive region of genome. All assays depend on the concept that more nicking, and more fragmentation is pathologic.

What should be the practice?
• Successful human reproduction depends on inherent integrity of Sperm DNA.  
• There appears to be a threshold of sperm DNA damage beyond which embryo development and subsequent pregnancy outcomes are impaired. 
• Spermatozoa of infertile men possess substantially more DNA damage as compared to fertile men. Our

...
understanding of the etiology of sperm damage is still rudimentary.

• During any ART procedure sperm handling should be done to avoid DNA damages.

• Life style modifications should be done to avoid such circumstance.

• More research is required to understand the concept and its implication to improve reproductive outcome.

References


Infertility affects about 10% of couples of reproductive age globally. Stem cells are considered as new therapeutic agents for infertility treatment. Stem cells are undifferentiated cells that are present in the embryonic, fetal and adult stages of life and give rise to differentiated cells that make up the tissues and organs. Recently there have been progress in potential of stem cells into oocyte production and ovarian regeneration in female infertility. Similarly, derivation of male germ cell from pluripotent undifferentiated stem cells.¹

Pluripotent stem cells are able to differentiate into cells that arise from the three germ layers—ectoderm, endoderm and mesoderm—from which all the tissues and organs develop. Commonly, stem cells are derived from the following two main sources: early embryos [embryonic stem cells (ESCs)] and adult tissue (adult stem cells).² ESCs are pluripotent stem cells derived from the inner cell mass of the blastocyst. The essential characteristics of ESCs include derivation from the preimplantation embryo, prolonged proliferation in their pluripotent state and stable developmental potential to form the derivatives of all three embryonic germ layers. Stem cells can also be derived from the extraembryonic tissues (amnion, chorion, placenta and umbilical cord). The advantage of stem cells derived from extraembryonic tissues is the efficient isolation from tissues normally discarded at birth avoiding ethical concerns that plague the isolation of human ESCs.³ Mesenchymal stem cells (MSCS) are one of the most common adults, multipotent stem cells. They can be derived from a variety of tissues including the bone marrow, adipose tissue, bone, Wharton's jelly, umbilical cord blood and peripheral blood.

Male infertility accounts for approximately half of all cases of infertility. ESCs can differentiate into male germ-like cells in vitro, but they are genetically unrelated to the patients, and the sources of human hESCs are limited.¹ The ectopic expression of transcription factors leads to the reprogramming of somatic cells to induced pluripotent stem cells (iPSCs), which resemble ESCs in morphology, pluripotency marker expression and differentiation ability. hiPSCs can be generated from patients' somatic cells but may not faithfully recapitulate the characteristics of hESCs at both genetic and epigenetic levels. Hayashi et al.¹ made the remarkable finding that primordial germ cell-like cells PGCLCs could be obtained from mouse ESCs and mouse iPSCs. PGCLCs could be differentiated into spermatozoa in vivo resulting in the birth of healthy offspring via ICSI. In spite of the progress in mice, the differentiation of hiPSCs to male germ cells still presents a significant challenge. Unlike hiPSCs in naive state, hiPSCs exhibit a primed pluripotency with less potential for the germ cell fate. Therefore, the success rate of germ cell derivation from hiPSCs is much lower than that from miPSCs. hiPSCs may not lead to clinical approaches addressing infertility resulting from defects in gametogenesis. Currently, human studies cannot be validated by transplantation or the production of offspring. At present, stem cells in male infertility is not leading to realistic treatment approach but has provided us new area of research.

For female infertility, stem cell-based strategies for ovarian regeneration and oocyte production have been proposed as future clinical therapies. White et al. identified a rare population of mitotically active germ cell in human ovaries that can be purified and cultured in vitro to spontaneously form oocytes. Herrera et al. introduced the beneficial effects of autologous stem cell ovarian transplant (ASCOT) on ovarian reserve and IVF outcomes for poor reserve. Herrera et al. identified 17 poor responder young women, bone marrow derived stem cells (BMSCD) were delivered directly to one ovary for each patient to optimize the recruitment of existing dormant oocytes to improve IVF outcomes. The study consisted of BMSCD mobilization to peripheral blood by granulocyte colony stimulating factor treatment and subsequent collection by aspiration. Cells were delivered into the ovarian artery by intrauterine catheter. The contralateral ovary in each patient served as a control. Patients then proceeded with controlled ovarian hyperstimulation for IVF with preimplantation genetic screening. Results after ASCOT were promising for poor responders, ASCOT resulted in a significant improvement in AFC two weeks after treatment. They defined success as an increase in AFC ≥3 follicles and/or two or more successful pregnancies in AMH levels and with these criteria ovarian function improved in 83.1% of women. These positive effects were associated with the presence of fibroblast growth factor-2 and thrombospondin in the apheresis sample. Among the 15 patients, five patients were achieved 2:1 after embryo transfer and 3:1 by natural conception. In allogeneic stem cell transplant (SCT), the recovery of ovarian function ranges from 14 to 24%, and the interval from SCT to first spontaneous menstruation ranges in 21 to 23 months. Recovery rates as high as 84% have been reported among patients with favourable predictors.

Stem cells have also been considered for the regeneration of human endometrium disorder like Asherman syndrome and thin endometrium. Azizi et al.³ evidenced that transplantation of transplantable stem cells with a diverse source in the endometrial zone had effects on endometrium such as decrease of fibrotic area, an elevated number of glands, stimulated angiogenesis, the enhanced thickness of the endometrium, better formed tissue construction, protected gestation, and improved pregnancy rate. Though role of stem cells looks promising, but it has not still become standard treatment, it requires further larger trials to recommend it as safe effective option.

Current assisted reproductive technology has become more successful but unable to help couples who lack functional gametes, unless donor gametes are used. Most couples wish to have their own genetically related child. With the rapid development of stem cell technology, the possibility to derive artificial gametes from human pluripotent stem cells may provide new therapeutic strategies for infertile couples. Presently, evidence is limited, whether healthy offspring can be produced from the gametes derived from pluripotent stem cells remains unclear.

References


Advantages of blastocyst transfer

1. More Physiological: Synchronization of embryo transfer with the stage of endometrium as in natural conception is more physiologic. During natural pregnancy, it takes around 5 days after fertilization for the embryo to reach the uterine cavity.

2. Selection of best quality embryo: This is based on the fact that best embryo will self select themselves and poor quality ones will fail to reach the blastocyst stage.

3. Improved pregnancy & implantation rates: Several studies suggest higher implantation rate of blastocyst stage as compared to early cleavage stage transfer on day 3. Recent Cochrane review of 12 RCT that reported live birth rate per cycle favoring blastocysts culture (Day 2 to 3: 31% Day 5 to 6: 38%). This means that for clinics that use early cleavage stage cycles, the rate of live births would increase from 32% to 42% if clinics used a blastocyst transfer approach.

4. Decreased risk of multiple pregnancy: The high implantation rates of blastocyst transfer accompanied by the methods used for selecting the best embryo for transfer makes it possible to achieve a respectable ongoing pregnancy rate after the transfer of a single embryo with no dizygotic twinning.

5. Pre-implantation Genetic Diagnosis (PGD): Blastocyst culture facilitates PGD of biopsied blastomeres as well as trophoderm orientation. Following the biopsy of the cleavage stage embryo on day 3 post insemination, continued culture up to day 5 gives time for genetic analysis as well as assessment. Culture of embryos till trophectoderm makes it possible to biopsy the trophoderm for pGD.

6. Derivation of Human Embryonic Stem (hES) cell: One of the most vital applications of blastocyst culture is the derivation of hES cell lines from the ICM of the blastocyst.

Limitations of blastocyst transfer

1. Poor Rate of Blastocyst Development in Vitro and Cancellation of Transfer: One of the major limitation of blastocyst transfer is that not all cleavage stage embryos develop into blastocyst. Some patients may not have any blastocysts available for transfer on day 5 despite having cleavage stage embryo on day 3 leading to cancellation of transfer. The question that would then remain unanswered is that would that woman have conceived with a day 3 transfer?

2. Monzygotic Twinning: Da Costa et al. (2001) reported that 3% of the pregnancies following blastocyst transfer achieved by monzygotic twinning as compared with 0.7% after 4-8 cell stage embryo transfer while 0.42% of natural pregnancies result in monzygotic twinning (Bulmer et al, 1970). In a recent retrospective analysis of 14,956 clinical pregnancies, blastocyst transfer indicated a 1% monzygotic twinning with an odds ratio of 2.0 irrespective of zona drilling, ICSI or type of stimulation used.4

3. Failure of Blastocyst Development and No Embryos Available for Transfer: Large offspring Syndrome: In vitro culture of embryos for 5-7 days in vitro has been associated with large offspring syndrome in certain animal species. This has been attributed to the suboptimal embryo culture conditions. This syndrome manifests as abnormal growth and development at fetal, neonatal and later stages of life. It has been shown that extended culture of embryos to the blastocyst stage can compromise many aspects of development including metabolism, differntiation, gene expression, imprinting and subsequent fetal development after embryo transfer in several mammalian species.

Blastocyst culture, although a little time consuming with its inherent limitations, is an important step ahead in the field of ARTs. However, before it can be routinely applied in an ART laboratory, it is essential that the laboratory first has the requisite infrastructure, maintenance and skills. Although, the pregnancy rate per blastocyst transfer is higher than pregnancy rates following cleavage stage transfer but if one were to look at the cumulative pregnancy rate per cycle started or per patient, then the result are not that dramatic. Because, the number of embryos that grow to blastocyst and are available for transfer or cryopreservation are much lesser.

One should use extended culture to blastocyst only when there are multiple cleavage stage embryos available for transfer so that those that do not develop to the blastocyst get deselcted. As of now, its routine blast transfer for all does not seem justified. Further studies are still required to have an optimal understanding of the metabolism of embryos and nutritional requirements. In the luminal secretions, the embryo is exposed to a variety of growth factors and cytokines while these are not routinely added to culture media. Growth factors are known to have pleiotropic effects on embryo development including blastocyst formation and hatching and it needs to be seen what the addition of these would further improve the development of blastocysts in vitro. Development of culture media closer to physiological environment might lead to blast for all.

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8. Dr. Archana Kumar
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IFS Jharkhand Chapter
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Non-invasive PGS – Is it Accurate?

MS, DNB (OBG), FNB (Reprod Med) PGDMLE
Secretary, IFS Karnataka Chapter
Clinical Director Milann Jayanagar

Dr. Divyashree P S

Dr. Shravya Thalapureddy

Blastocyst Fluid (BF) Analysis

Palini et al. reported for the first time the identification of cell-free DNA by real-time PCR in 90% of expanded blastocysts prior to vitrification.5 The researchers demonstrated amplification rate of 95% for the testis-specific protein Y-linked 1 (TSPY1) multipycopy gene on the Y chromosome, for the identification of male embryos. But a study by Tobler et al in 2015, showed high amplification failure and diagnostic non-concordance rates, thereby calling for more technical improvements.6 But the research by other investigators was more supportive, especially underlining the role BF cell-free DNA analysis in screening monogenic disorders.

Limitations and future research

Technical reliability of the procedure and appropriate sample volume required for successful DNA isolation and amplification have not yet been defined. Blastocentesis or BF aspiration is not a non-invasive method but is rather a less invasive method than PGT for obtaining embryo-derived DNA. But, in view of the practice of collapsing artificially expanded blastocysts before vitrification
gaining popularity to improve ART success rates, BF analysis is being studied extensively. However, it is not known whether depletion of the BF would alter the cell-to-cell communication within the developing embryo and how it would impact the embryo competency and its interaction with the environment.

Spent Blastocyst culture Media (SBM) analysis

Cell-free DNA from blastocyst culture media can be isolated, amplified and analysed by 24 chromosomes comprehensive screening NGS. This represents a potential source of DNA for non-invasive detection of chromosome abnormalities. Assou et al. developed a proof-of-concept study using quantitative PCR (qPCR), confirmed the presence of cf DNA in the media of Day-5/6 embryos, measuring up to 27 ng/mL DNA per sample. They were successful in amplifying the multiycop gene TSFP1 on the Y chromosome enabling identification of embryos based on the Y chromosome. These findings heralded the way for a newer and non-invasive approach to the pre-implantation diagnosis of sex-linked diseases. Soon after, numerous reports from different research groups followed. Multiple studies have compared cf DNA from SBM with the standard PGT-A from trophectoderm biopsy. Amplification rates of cell-free DNA from spent culture media in various studies ranged between 80–100%, however, concordance rates have been variable. This may be attributed to discrepancies in methodologies applied in – Embryo culture – drop volume, time in culture, single vs sequential culture; Blastocyst isolation – assisted hatching, vitrification and associated blastocystesis; DNA analysis – different amplification and detection methods and finally different criteria being used to define concordance rates. A recent study in 2019 by Rubio et al. using an optimised protocol, accounting for the above-mentioned discrepancies, found high concordance rates (78.7 – 84%) between TE biopsy and SBM analysis. The investigators also found threefold greater implantation rates for euploid TE/aneuploid SBM embryos (52.9% vs. 16.7%). And no clinical miscarriages were reported in euploid TE/ euploid SBM embryos group.

Limitations and future research

Sample collection

It is still unclear whether the choice of a sequential or single culture medium system potentially influences the yield of cf DNA. Liu et al. (2017) proposed cultivating embryos in a single continuous medium system until blastocyst formation in order to improve the cumulative yield of cell-free DNA. However, higher testing accuracy was demonstrated by lane et al. in 2017, when the culture media has been in contact with embryonic DNA for the longest time (Day 3 to 5). This observation may be explained by the increase in the embryonic-to-maternal DNA ratio, which occurs with the exponential rise in the embryonic cell number at blastulation. In a study by Rubio et al. (2019), higher concordance rates were noted for day 6/7 samples compared to day 5 samples. Further studies are required to identify ideal sampling times in relation to the stage of embryo development that are associated with better DNA detection, amplification and concordance rates.

Controls and contamination

Control samples were obtained from embryo culture droplets, but human DNA is often noted in embryo free droplets of protein supplemented culture media. Further, DNA from residual cumulus cells could lead to maternal DNA contamination leading to decreased sensitivity and false negatives. Some studies have shown evidence of sex discordance between SBM and TE biopsy – male SBM identification from TE diagnosed female embryo – this could be attributed to external DNA contamination from plasticware, media or manipulation during IVF. Also, presence of residual polar bodies can lead to discrepancies in sex or complementary aneuploidies.

Origin of cell-free DNA and significance:

The biological significance of fragmented cell-free DNA is yet unknown. Some studies have suggested a role in cell-to-cell communication within the developing embryo and its surroundings (Hammond et al., 2017). Some researchers believe them to be generated from apoptosis during normal embryo development or should mosaic embryos shed their excluded cells into the blastocoeal cavity culture media during development as part of a natural repair mechanism then this could then result in a potential mismatch between the ploidy profile of the cell-free DNA and its corresponding embryo. Research remains inconclusive regarding the origin of cf DNA – is it from ICM / TE? Questions also remain if the obtained DNA material is truly indicative of the genetic constitution of the embryo as a whole.

Over the past few years, with the rapid emergence of efficient molecular platforms for genetic testing, screening for aneuploidy has been increasing in ART. Trophectoderm biopsies are a definite representative of mosaic errors but for mitotic errors and mosaicism, embryonic cell-free DNA might open new avenues for insight and understanding. While liquid biopsy (cf DNA) seems like an attractive option especially considering that it avoids invasiveness, potential embryo harm, minimises lab and personnel expenses and extends feasibility and accessibility to wider population, several hurdles must be challenged before accepting NI-PGT as a reliable method of pre-implantation genetic testing. Hurdles include questions regarding the completeness of representation of the embryonic genome by cell-free DNA present in the BF and spent culture media. Further techniques are required to minimise external DNA contamination and optimise DNA isolation and amplification methods. Molecular testing and analytical platforms for cell-free DNA isolation also need rigorous validation before clinical applications. Well-designed studies are required to improve this technology for potential translation into standard genetic testing and better pregnancy outcomes.

References

2. Vera-Rodríguez M, Rubio C. Assessing the true incidence of mosaicism in preimplantation embryos. Fertil Steril 2017; 107:1-7. (2017) 3. It avoids invasiveness, potential embryo harm, minimises lab and personnel expenses and extends feasibility and accessibility to wider population, several hurdles must be challenged before accepting NI-PGT as a reliable method of pre-implantation genetic testing. Hurdles include questions regarding the completeness of representation of the embryonic genome by cell-free DNA present in the BF and spent culture media. Further techniques are required to minimise external DNA contamination and optimise DNA isolation and amplification methods. Molecular testing and analytical platforms for cell-free DNA isolation also need rigorous validation before clinical applications. Well-designed studies are required to improve this technology for potential translation into standard genetic testing and better pregnancy outcomes.

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Physiology behind the use of HCG and GnRH

During the follicular phase of the menstrual cycle, there is pulsatile release of Gonadotropin hormone (GnRH) which then results in release of Follicular stimulating hormone (FSH) and Luteinising hormone (LH) in pulsatile pattern thereby regulating the follicular growth. Rapidly rising oestradiol from the dominant follicle along with a small rise of progesterone leads to gonadotrophin surge during midcycle. Increased LH surge ultimately results in ovulation. LH exposure results in resumption of meiosis with maturation of the oocyte from the immature “metaphase I” phase to the mature “metaphase II” phase of development. A critical step in current IVF protocol is a well-planned LH exposure thereby enabling the efficacious retrieval of mature oocytes.

Human chorionic gonadotrophin being structurally similar to LH and with a longer half life has been the most widely used trigger to stimulate ovulation as well as for pick-up of mature oocytes from stimulated ovaries in cases of in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) cycles. Nakanou et al. showed that LH surge could be induced using a bolus of GnRH agonist (GnRHa) when given intravenously. The endogenous surge of LH and FSH via use of GnRHa closely resembles the natural midcycle surge. This midcycle FSH surge is important due to the fact that it up regulates LH receptor sites in granulosa cells. FSH also promotes resumption of oocyte meiosis, expansion of cumulus cells - critical steps in the oocyte maturation process. Hence, one of the anticipated benefits of GnRH trigger is retrieval of increased number of mature oocytes. Another added advantage of GnRH trigger is that it reduces the risk of ovarian hyperstimulation syndrome. Researchers have shown a higher abortion rate with reduced implantation, ongoing pregnancy and live birth rates in GnRH-agonist trigger as compared to standard luteal phase support and hCG trigger. Difficulty with GnRH agonist trigger when used alone is that it reduces early corpora lutea thereby Poor Responder to ovarian stimulation remains one of the most challenging aspects in the field of infertility management. Stimulating exogenous human chorionic gonadotrophin remains the standard trigger in women undergoing ovulation induction but there remains a risk of ovarian hyperstimulation syndrome and premature luteinizing hormone surge with its use.
Social egg freezing: Should it be propagated as the future reproductive technique?

Initiated by the success of contraception in the 1960s and accelerated by the subsequent rise in female employment and tertiary academic opportunity, the age of first-time reproduction was trending toward older ages. While the first egg freezing technique was developed in the late 1980s, it was the development of improved cryopreservation techniques in the late 1990s and early 2000s that led to the current success reported in the literature. Progress in cryopreservation techniques and the development of improved egg freezing techniques have lead to a number of studies that have evaluated the impact of egg freezing on pregnancy outcomes.

In 2005, Abraham et al. conducted a meta-analysis of 41 RCTs involving 3,073 women to determine the impact of cryopreservation on live birth rates. The results showed that the mean number of high-quality embryos was significantly higher in the cryopreserved oocyte group (p=0.011) and that the mean number of embryos available was (p=0.001). In another retrospective cohort study conducted by Zhou et al. in 2007, with 5,275 women, the investigators found that women who underwent cryopreservation had a significantly higher live birth rate (52.9% vs. 30.9%), implantation rate (41.1% vs. 16.1%), clinical pregnancy rate (39.3% vs. 18.3%), and live birth rate (33.8% vs. 16.8%) as compared with the non-cryopreserved group.

In a recent systematic review and meta-analysis of 427 GnRH antagonist cycles, Lin and colleagues investigated the role of GnRH antagonist in improving live birth rates in women with diminished ovarian reserve. The results of this meta-analysis showed that the GnRH antagonist trigger had a significantly higher pregnancy rate (relative risk [RR], 1.55; 95% confidence interval [CI], 1.17-2.06) as compared with the GnRH agonist trigger. The most significant differences were noted in the number of retrieved oocytes, number of mature oocytes retrieved, number of fertilized oocytes, number of good-quality embryos obtained, and clinical pregnancy rates. In a retrospective cohort study comparing 6,500 Iu of hCG (dual trigger) with 0.2 mg of triptorelin along with 6500 Iu of hCG (dual trigger), the mean number of embryos available (p=0.001), and the mean number of high-quality embryos (p=0.011) was higher in the dual trigger group.

In summary, though dual trigger seems to be a promising technique for oocyte maturation yielding the number of retrieved oocytes and improving reproductive outcomes, further randomised controlled trials need to be undertaken to prove its efficacy.

References:
In a study published by Lin et al in 2012, where 133 patients with unilateral tubal occlusion underwent stimulated IUI and control group of 570 patients of unexplained infertility. The pregnancy rate was better in patients with proximal occlusion (25.0%) than in those with distal occlusion (13.9%) or unexplained infertility (16.5%). Therefore, stimulated IUI can be suggested as the initial treatment option in women with unilateral proximal tubal occlusion. They suggested that stimulated IUI can be offered as the first-line option in women with unilateral distal tubal occlusion because the pregnancy rate was similar to those with unexplained infertility.4

Farhi et al (2007) reported that the cumulative pregnancy rate in women with unilateral mid or distal tubal occlusion (19%) was lower than in those with unilateral proximal tubal occlusion (38.2%) and was significantly lower than in those with unexplained infertility (42.6%). Thus, in this study the authors concluded that in patients with unilateral proximal tubal occlusion stimulated IUI can be suggested as the initial treatment option but in patients with unilateral distal tubal occlusion on HSG should be referred for laparoscopic assessment or IVF.5

Hysterosalpingography (HSG) or laparoscopy are the two most common procedures used for evaluation of tubal patency. HSG is often the first line approach to check for tubal patency. Treatment of women presenting with infertility with bilateral patent or obstructed tubes detected on HSG is clear and direct. However, there is no standard management for patients with unilateral occlusion.

Proximal tubal occlusion prevents the sperm from reaching the ampullary portion of tube where fertilization happens. Whereas, distal tubal occlusions affect the ovum capture from the ovary. Proximal tubal occlusion is all or none phenomenon, whereas distal tubal occlusion exhibits a spectrum ranging from mild (fimbrial agglutination) to moderate (varying degree of fimbrial phimosis) to severe (complete obstruction).

The possible option for patients with unilateral tubal occlusion are:
• Repeat HSG
• Laparoscopy and hysteroscopy for evaluation and possible correction of tubal block
• Selective salpingography and fluoroscopic tubal catheterisation

The risk of ectopic pregnancy in patients with one blocked tube who undergo IUI is slightly high compared to patients with bilateral patent tubes. This is because most conditions that affect the tubes, like endometriosis or pelvic inflammatory disease, tend to impact both tubes. A tube that is open, but has issues, is more likely to have difficulty passing the embryo into the uterus, so the embryo can become embedded in the tube resulting in an ectopic pregnancy. The patients should be counselled about this risk.

Conclusion
• Unilateral proximal tubal occlusion, stimulated IUI can be offered as the first line option
• Whenever HSG shows a proximal occlusion, most often confirmation by repeat HSG or laparoscopic chromopertubation should be considered as it is just a false reading in which the tube is actually open on subsequent testing.
• The success of IUI in women with only one patent fallopian tube is comparable to those with both patent tubes.
• Pregnancy rates seems to be more affected by the age of male factor infertility if present.
• For women with mid-distal tubal occlusion, stimulated IUI might not be a good choice because of a lower success rate, and either surgical intervention or IVF might be preferred
• These patients undergoing IUI should be counselled about a small but increased risk of ectopic pregnancy

References
Single versus double Intrauterine Insemination

**Indications for Intrauterine Insemination in the era of IVF and ICSI**

IUI is the first line of treatment for mild factor male infertility and unexplained infertility. The success of IUI is better than timed intercourse with ovulation induction. But it can be done for couples when the IUI is better than timed intercourse with ovulation infertility and unexplained infertility. The success of IUI is the first line of treatment for mild factor male infertility. When TMSC (total motile sperm count) is less than 6 million per ml and the IUI should be done close to the time of ovulation to enhance the chances of conception in cases of idiopathic infertility. The key to success is the contact and cross talk of the sperm with the oviduct and the endometrial factors. The key to success is the contact and cross talk of the sperm within 12 hours of ovulation so as to improve success and fertilisation around the time of ovulation so as to improve success and fertilisation. The aim is to make the couple fertile for fertilisation around the time of ovulation so as to improve success and fertilisation around the time of ovulation so as to improve success and fertilisation. The success of IUI is better than timed intercourse with ovulation induction. But it can be done for couples when the female partner age is less than 40 years without any tubal factor. If no conception after 4 cycles of IUI, IVF/ICSI induction. But it can be done for couples when the IUI is better than timed intercourse with ovulation infertility and unexplained infertility. The success of IUI is the first line of treatment for mild factor male infertility and unexplained infertility. When the 2 dominant follicle is ≥ 18 mm expecting ovulation to occur. Ovulation is not always confirmed by USG or LH kits in a clinical set up. Hence to achieve the objective of the presence of sperms around the time of ovulation a double IUI has been undertaken usually after 24 to 48 hours and or after confirming ovulation. A study undertaken on 1146 stimulated cycles concluded that a single IUI timed post-ovulation gives higher pregnancy rates in non male factor infertility and double IUI gives better pregnancy for male factor infertility.4

Success rates more with Double IUI

Matilsky and colleagues in 1998 reported the probability of 2 times the cumulative pregnancy rate with double IUI over 15 cycles with frozen-thawed donor semen.4 Liu W and colleagues in 2006 undertaken double IUI initially at 18 to 24 hours after hCG trigger and second insemination 36 to 48 hours later among 1270. Pregnancy rates were 19.87% when compared to 11.06% with single IUI undertaken 34 hours after trigger.3 Randall and Gant in 2008 reported statistically significantly high success rates with double IUI when compared to single IUI 19.5% vs 12.9% in women with Ovarian dysfunction and 17.5% vs 7.9% in couples with mild male factor.2 A Cochrane systematic review on single versus double IUI in stimulated cycles for subfertile couples published in 2003 which included 5 trials concluded that double IUI was beneficial as it resulted in increased clinical pregnancy rates.7

Success not significantly higher with Double IUI

A randomised controlled trial from Iran published in 2016 concluded that there was no statistically increased pregnancy rate in double IUI group compared to single IUI though the pregnancy rate was marginally high (Single Vs Double:11.7% Vs13.4%).8 A prospective randomised controlled study in 2017 undertaken in 197 subjects found a success rate of 13.86% with single IUI and 18.75% with double IUI and the difference is not statistically significant.9

A meta analysis which included 6 trials found no significant difference in clinical Pregnancy rates per cycle between single versus double IUI in women with unexplained infertility.10

Choudhary and colleagues in 2018 published a study in a small sample size of 100 subjects and concluded that though there was no statistically significantly higher pregnancy rates overall with double IUI, in women who received gonadotropins for ovulation induction double IUI resulted in higher pregnancy rates.4

Key Messages

1. IUI is the first line of therapy for couple below 40 years of age.
2. The success rates are typically 10-20%.
3. Success rates may be increased with double IUI in certain clinical situations like mild male factor infertility or unexplained infertility.
4. Overall single IUI is as effective as double IUI when properly timed. Single IUI timed post-ovulation for non-male factor infertility and double IUI performed pre-ovulation for male factor result in better pregnancy rates. However each case has to be individualized and IUI should be done close to the time of ovulation or very soon after ovulation.

References:


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Dr Papa Dasari
Endometrial Receptivity Array (ERA) & its Clinical Implications

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This article highlights the need for methods to objectively diagnose endometrial receptivity as a factor contributing to infertility in female patients. The correct identification of the appropriate window of implantation in a given patient, by using endometrial receptivity biomarkers, can help to prevent reproductive failure resulting from misplaced timing of the endometrial window of implantation (WOI). Although to date no single, clinically relevant molecular, ocular, or histologic marker capable of indicating endometrial receptivity status has been identified, global transcriptomic analysis of human endometria performed in the last decade has given us insights into a genomic signature that is capable of identifying endometrial receptivity. As a consequence, a genomic tool named the Endometrial Receptivity Array (ERA), based on a customized microarray, was developed, and along with it a specially trained bioinformatic prediction computer algorithm was created to identify WOI timing in the endometrium. This tool has proven more accurate and consistent than histologic (Noyes) dating at identifying the personalized WOI day, thus leading to the new clinical concept of personalized Embryo transfer (pET) on the optimum day of endometrial receptivity, identified individually by case.

Window of Implantation

The embryo is unable to adhere to the endometrium through most of the menstrual cycle in humans, except during a short, self-limited period, in which the endometrial tissue acquires a functional and transient status that permits blastocyst adhesion and is therefore receptive. This specific period, which is regulated by a combination of ovarian steroid hormones and genetic factors, is known as the window of implantation (WOI) and lasts 5 to 6 days after an exogenous or endogenous P impregnation.

Markers of Endometrial Receptivity

Unfortunately, no single specific endometrial receptivity biomarker has been identified, meaning that objective diagnosis of endometrial receptivity remains neglected in the patient infertility workup. Despite the historical relevance of traditional Histologic endometrial dating: Histologic endometrial dating criteria defined by Noyes,25 its accuracy, reproducibility, and clinical utility has been repeatedly questioned in randomized 4, 5 and prospective studies,12,13 and thus it is no longer used to guide clinical practice owing to its real and perceived limitations. It has been suggested that pinopodes, ectoplasmic projections on the surface of endometrial epithelial cells,13, 15 may be a good morphologic marker for diagnosing endometrial receptivity status. However, it has been reported that pinopodes are still present in the postreceptive period and therefore cannot be used as a reliable morphologic receptivity marker.15

Biochemical markers: Biochemical markers like integrins,16 mucin 1 (MUC1),27 calcitonin,18 leukemia inhibitory factor (LIF),16 cyclooxygenase 2,29 and homeobox A10 (HOXA10)20 have been studied, but none of them has been translated into clinical practice as an endometrial biomarker.27

Microarray technologies: Microarray technologies now allow more reliable, quantifiable gene expression monitoring, and these technologies have been used to investigate the transcriptomics of human endometria in the different phases of the menstrual cycle, including within the receptivity phase.14,24 Importantly, these studies demonstrated that differential gene expression patterns exist in different phases, thus allowing the molecular status of the endometrium to be classified according to its transcriptomic signature regardless of its histologic appearance.

Transcriptomics Of The Human Endometrium

The transcriptome reflects the genes that are actively expressed at any given time within a specific cell population or tissue.

Endometrial Receptivity Array

The Endometrial Receptivity Array (ERA) is a customized array based on the transcriptomic signature of human endometrial receptivity, specifically when human endometrium is receptive to blastocyst adhesion (26). It has been designed to identify endometrial receptivity by comparing the genetic profile of a test sample with those of LH+7 controls in a natural cycle, or on day 5 of P administration (P+5) after E2 priming in a hormonal replacement therapy (HRT) cycle. It consists of a customized array, containing 238 genes that are differentially expressed between these profiles, which is coupled to a computational predictor that can diagnose the personalized endometrial WOI of a given patient regardless of their endometrial histology.26 To select the genes for inclusion in the ERA platform, this group analyzed the expression profile of endometrial samples obtained on day LH+7 in a natural cycle compared with the prereceptive phase (LH+1, +3, +5).27 Using stringent criteria of a 3.0-fold change increase and false discovery rate of <0.5, 238 genes were selected that were incorporated into a customized Agilent gene expression microarray using the 569 probes already existing on the array. The ERA expression values for the training set were used to train the bioinformatic predictor to classify an endometrial sample as “receptive” or “nonreceptive.” (Fig 1)

Fig 1: Customized microarray (238 genes)

Bioinformatic analysis of data obtained by the customized microarray

Classification and prediction from gene expression (as receptive or nonreceptive)

Once the array and the predictor were designed, a cohort of samples obtained in the prereceptive (LH+1, +3, +5), receptive (LH+7), and proliferative phases (days 8–12 of the menstrual cycle) were used to validate this transcriptomic signature. Specificity and sensitivity figures of 0.8857 and 0.99758, respectively, was obtained.26

The reproducibility of the ERA was tested by analyzing a second biopsy obtained from the same patient, on the same day of the menstrual cycle, 2 to 3 years after the first one. Paired-sample gene expression analysis showed the reproducibility of the tool and demonstrated that the transcriptomic profile of the mid-secretory phase endometrium did not substantially change between cycles for over relatively long periods of the women’s reproductive life. Concordance for ERA endometrial receptivity dating against the LH peak showed a value of 0.922 (0.815-1.000), and the reproducibility of the ERA test was 100% consistent (28) (Table 1)

Table 1: Consistency of ERA

<table>
<thead>
<tr>
<th>Code</th>
<th>Date First Biopsy</th>
<th>Date Second Biopsy</th>
<th>Months Separation</th>
<th>First Biopsy Results</th>
<th>Second Biopsy Results</th>
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<tr>
<td>COAD</td>
<td>01/09W</td>
<td>01/12W</td>
<td>3</td>
<td>Receptive</td>
<td>Receptive (0.908)</td>
</tr>
<tr>
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<td>05/12W</td>
<td>3</td>
<td>Proliferative</td>
<td>Non receptive (0.864)</td>
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<td>Non receptive (0.864)</td>
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<tr>
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<td>07/09W</td>
<td>07/12W</td>
<td>3</td>
<td>Receptive</td>
<td>Receptive (0.864)</td>
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Hence, for the first time, a molecular tool based on the expression of a cluster of endometrial biomarker genes can be clinically used in reproductive medicine to assess the endometrial receptivity factor with proven accuracy and consistency.

Clinical Applications

The diagnostic and clinical value of the ERA test has been tested in a prospective, interventional, multicenter, clinical trial23 in which patients with recurrent implantation failures (RIFs) and controls underwent endometrial receptivity diagnosis using an endometrial biopsy obtained either on

day LH+7 in a natural cycle or on
day P+5 in an HRT cycle.

Patients with at least three previous failed ovum donation cycles, and IVF patients aged <40 years, with at least three failed IVF cycles, made up this group. The ERA test identified 73.7% of the samples as receptive and 26.3% of them as nonreceptive. Patients with a receptive ERA diagnosis achieved a 62.8% pregnancy rate and a 37.9% implantation rate, when transferred the day after the receptive ERA diagnosis, which was similar to controls for whom the embryos were transferred in a subsequent cycle.

At the clinical level, the most important contribution of the ERA test is the objective diagnosis of the window of implantation, thus leading to the creation of the concept of personalized ET (pET) (Fig 2).

Fig 2: Clinical algorithm for pET.

Ref: Ruiz-Alonso. Personalized ET in patients with RIF. Fertil Steril 201328

Personalised medicine is a well-accepted concept in reproductive medicine. However, the medical community has always considered that all infertility patients must be equally treated in terms of the day of ET, which is guided by the embryo development stage and supported by the administration of P/hCG in the luteal phase. Given that personalized endometrial receptivity diagnosis is now possible, it is considered of utmost importance that a personalized approach to improving clinical success from the endometrial perspective be used.

This test is recommended for patients RIF with apparently normal uterus and with normal endometrial thickness (>6mm), in which no problems are apparent.
A displaced implantation window is detected in approximately 20% of these patients.

Further plan of action based on ERA report

The ERA test informs us whether the endometrial biopsy obtained during the expected WOI is really in a receptive state or whether it is nonreceptive at the time of testing. In the first case, ET must be performed in a subsequent natural or HRT cycle on the designated day. In case the result is nonreceptive, it can then be classified by our predictor as pre- or postreceptive (Fig 3), and a second ERA test following this guideline can be performed to validate a personalized WOI resulting from displacement caused by some intrinsic genomic alteration inherent in the patient, an observation which has been made in one in four RIF patients (29). This new concept has been functionally proven by applying pET, following ERA results indicating alteration inherent in the patient, an observation from displacement caused by some intrinsic genomic

Fig 3: The importance of pET can be understood by a case presented by Ruiz Alonso et al in 2014, where 7 embryo transfers failed including all possibilities viz self day 3 transfer, self day 5 transfer, IVF with donor oocyte in a natural cycle, IVF with donor oocyte in a HRT day 3 and day 5, including both fresh and frozen transfers. On performing ERA, the WOI was found to be displaced, and the women conceived with pET by transferring day 5 blastocysts (with donor oocytes) in HRT cycle after 7 days of progesterone supplementation (P+7). So it is evident what a difference two days can make. (Fig 4).19

Fig 4: Successful Treatment after pET

Wider implications of ERA in future

Although this molecular tool currently focuses on RIF patients, research is underway to test the ERA in patients with endometriosis and hydrosalpinx. However, a prospective, randomized study on the effectiveness of the ERA test in the infertility workup, to guide pET in patients receiving assisted reproductive technology treatments, is the need of the hour. Whether these technological improvements will translate into clinical diagnostic advances, remains to be seen. Moreover, this molecular tool could be useful not only for clinical diagnosis but also for research based on the analysis of variations in receptive expression profiles due to different treatments or conditions.


References

Kerala

Tribal Fertility Healthcare project
- 116 TRIBAL VILLAGES IN KERALA with an average population of 17,000-21,500 women of reproductive age group in extreme poverty.

Aims:
- Women's healthcare screening
- Supply of healthy food
- Reproductive care - Obstetric care
- Fertility support

Project approved by Govt of Kerala and partially funded; Will be operational with the help of Reproductive Health committee of KFOG.

Flood - 2 relief activities
- Northern Kerala affected
- 1800 plus families totally dislocated
- 46 families could not be traced following landslide in western ghats
- 20 member team from IFS Kerala Chapter joined with IMA and local health admin and visited many camps and supplied medicines, food materials and dress items worth total 7 lakhs rupees
- Follow up activities are on place

Uttarakhand

Infertility Camp under aegis of IFS held in Muzaffarnagar

Chattisgarh

Dr Manoj Chelani Founder Secretary is doing free check up once a month
Dr Yeronica Yule jt. Secretary is doing free checkups

Rajasthan

Infertility Awareness & Free Consultation Camp & Talk on 16th May, 2019 at Jhunjhunu
Attended by 21 Patients

UP West

Regular out station IVF Camps organised by Deptt of Obs & Gynae, SrMSIMS

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26.03.2019 Badaun
27.03.2019 Sambhal
08.05.2019 Badaun
04.05.2019 Pilibhit
19.06.2019 Ujhani
10.07.2019 Bisoli
23.07.2019 Rudrapur
And many more to come…

Fertility Science and Research Journal – An IFS Publication…

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We are circulating an approximate of 2500 copies. Initially frequency of publication was biannual. Now it has been made triannual.

The Current Issue …… The current issue deals with interesting and pertinent issues faced by the current day ART specialists. Stem-cell therapy, although still in its nascent stage, has come out with certain options in the management of male as well as female infertility. The subsequent articles deal with the extremely important and burning issue of ovarian reserve and its testing and a study of poor responders and comparison of their managements in the diagnosis as well as the management of infertile couples. Another retrospective analysis of the antagonist cycles to assess the ovarian reserve parameters gives an overall view of the clinical parameters assessing the success of in vitro fertilization (IVF) cycles. An interesting analysis correlates the interleukin concentrations in the follicular fluid states it to be a reliable predictive marker of successful IVF/ outcome. Comparison of fresh versus frozen embryo transfer in IVF cycles highlights the utility of frozen embryo transfer cycles in polycystic Ovarian syndrome (PCOS) and hyperstimulated patients, with comparable efficacy. An article clearly specifies the use of single versus double IUI in ovulation induction cycles. This issue has been nicely brought out the importance of mental and psychological health of patients undergoing treatment of infertility.

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Articles can be submitted online http://www.fertilityscienceresearch.org

And many more to come…
In its endeavor to spread knowledge in the field of fertility, IFS organized two editions of IFS Pathsala - Certified Master Courses in year 2018-2019.

Master courses were uniquely designed with very precise and specific modules covering concepts and latest advancements alongside state of ART laboratory techniques and procedures. Due to excellent course content, experienced faculty, and effective management, master courses was well received and in fact organizers have to increase minimum limit of participants per session.

Master courses also put lot of effort to bring in very heterogeneous mix of participants with experience and established practitioners along with young enthusiasts so that participants can tap in to each other experience along with the knowledge shared by faculty. It also had clinicians and embryologists synchronizing among each other.

Master courses in its holistic approach covered “Triad” of Concepts, hands on laboratory techniques and Standard operating procedures. Experienced faculty with national repute shared their experiences in the field of ovulation induction, reproductive endocrinology and applied genetics. Master courses also witnessed hands on laboratory procedures like semen analysis, IUI setup, comprehensive advanced andrology techniques, cryopreservation of semen, oocytes, embryos and Concepts of embryo culture, media and labware. Master courses also detailed QA/QC (Quality Assurance and Quality Control) measures along with ICMR guidelines for ART Centre.

IFS Pathsala with its first edition laid foundation for future of training in field of fertility with extremely encouraging and satisfying feedback, many enquiries are already flowing in for next and bigger version of IFS Pathsala.

ART TEXT: this has been brought out on various topics like hydrosalpinx, poor ovarian reserve, adenomyosis and thin endometrium. This was an initiative by Prof. Pankaj Talwar who is the chief editor.

NEXUS: An embryology update brought out by Indian fertility society on topics like Semenanalysis, Intrauterine insemination, Semen freezing, sperm function test, media, vitrification, oocyte retrieval and embryo Transfer. This was an initiative by Prof Pankaj Talwar who is the chief editor. New editions onco navi
Congratulations to all the candidates successfully passing the Examination DCR & DCE 2018-2019

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<td>Ms Divya Lakshmi A</td>
<td>Jindal</td>
<td>Ms Rachita Chawla</td>
<td>Kochi, Kerala</td>
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<td>Ms Princy Mittal</td>
<td>Akanksha IVF</td>
<td>Ms Simmi Arora</td>
<td>Jodhpur</td>
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<td>Ms Ruchi Chhabra</td>
<td>Pune</td>
<td>Ms Manvi Tyagi</td>
<td>Ahmedabad</td>
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<td>Ms Zeepee Godha</td>
<td>Akanksha IVF</td>
<td>Ms Shilpa Singhal</td>
<td>Primus</td>
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<td>Ms Soumya Dash</td>
<td>Mother &amp; Child</td>
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IFS Conducts along with Amity University

a one year Diploma in Clinical ART and Diploma in Clinical Embryology 2019

18 candidates of Diploma in Clinical ART and 5 of Diploma in Clinical Embryology passed out successfully.

TRAINING AND EDUCATION – A PRIORITY WITH IFS

IFS Embryology Certification & Preparatory Course for ESHRE on 4th & 5th Dec 2019 at IHC Delhi With Dr Kuldeep Jain, Prof Arne Sunde, Norway, Dr Jayant Mehta, UK and Dr Gouri Devi

Candidates taking preassement exams, exhaustive teaching and evaluation for 72 hours. Total 30 Candidates with 10 Delegates from Thailand.

DR GOURI DEVI
President, IFS

DR KULDEEP JAIN
Course Chairperson

DR PANKAJ TALWAR
Secretary General, IFS

DR JAYANT MEHTA
Course Director

DR ARNE SUNDE
Course Director
Dr Shweta Mittal presented a poster at ESHrE 2019: "Impact of day 5 versus day 6 blastocyst on pregnancy outcome of frozen thawed donor recipient cycles."

Dr Monica Varma from Punjab Chapter IFS presented a poster at ESHrE 2019: "Higher risk of preeclampsia in singleton pregnancies from donor versus autologous oocytes, with similar endometrial preparation, in a healthy, young cohort: a prospective study."

She had also suggested seven points for the ESHrE 2019 Guidelines for Good Practice Recommendations for Ultrasound in ART: Oocyte Pick-up and all 7 were accepted in the final guidelines. Her name is in the Reviewers List of these guidelines.

Dr Uma Srivastava (Nepal Chapter) presented a poster at World Conference on PCOS in Abu Dhabi.

Dr Bindu N. Chimote (Nagpur, Vidharbha Chapter IFS) presented an Oral presentation at ESHrE 2019. Topic: "Evaluation of the hormone Dehydro-epiandrosterone sulphate (DHEAS) as a potentially compelling ‘oocyte-related factor’ in mammalian oocyte activation: A paradigm shift?"

Dr Natchandra M. Chimote (Nagpur, Vidharbha Chapter IFS) Faculty/Oral Presentation at European Society for Human Reproduction and Embryology (ESHRE), Date and Time: 24th June 2019, 10.00 am. Topic: "Mapping the follicular fluid bio-molecular profile: Dynamic interactions set the algorithm for oocyte maturaiton, embryo development and successful outcomes in IVF cycles."

Dr randir Singh and Dr Monica Singh from Bhopal (MP Chapter, IFS) - 3 posters presented at ESHRE 2019. O-003 Topic: "Impact of day 5 versus day 6 blastocyst on pregnancy outcome of frozen thawed donor recipient cycles."

Dr. Bindu N. Chimote and Dr. Natchandra Chimote on receiving Peoples Choice Best Video Poster Award.

Congratulations! Dr Bindu and Dr Natchandra Chimote on receiving Peoples Choice Best Video Poster Award.

Congratulations! Dr Monica Verma for being part of Reviewers List in ESHRE GUIDELINES 2019 Good Practice Recommendations for Ultrasound in ART.
3 panels on improving ART outcome - clinical and embryology perspective and Recurrent implantation failure were held which were highly appreciated and well attended. IFS represented by Dr Kuldeep Jain, Dr Gouri, Dr KD Nayar, Dr Shweta Mittal, Dr Kunjumoiddin, Dr Mohan Kamath, Dr Gaurav Majumdar, Dr Saumya.

The Joint session of IFS / ISAR was conducted at IFFS world congress Held in Shanghai from 11th - 13th April, 2019

Dr Gouri, President IFS with Dr. Michel Ab dallah, Exc. Director of MEFS and Dr Johnny Avaad, The Scientific Chair

American Society for Reproductive Medicine (ASRM) Annual Meeting 2019 Philadelphia

Dr Kuldeep Jain and Dr KD Nayar representing IFS at ASRM

Dr Gouri President IFS with Botros Rizk, President MEF at the Annual Meet

26th Annual Scientific Meeting of Middle Eastern Fertility Society (MEFS) 31st Oct - 2nd Nov. at Cairo, Egypt
**Telangana**

**Vision Statement**  
"Vision for IFS Telangana chapter is to encourage research, broadcast educational information, and promote the advanced clinical care of patients in all aspects of reproductive medicine. Assisted Reproduction Technology (ART) and embryology related research in stem cells and cloning."

**Executive Committee**

**Chief Patron :** Prof P.P. Reddy  
**Secretary :** Dr. Roya Rozati  
**Joint Secretary :** Dr. Meera Raj Gopal  
**Treasurer :** Dr. Krishna Leela  
**Executive Council Members :**  
- Dr. Radhika Gopura Dr. Ch. Sornpa Dr. Suvrachala Vardan Chokuri Dr. Srikanth Warampale

**Activities 2019**

**Activity 1**  
CME - The Setting up of an ART Lab/ Clinic on 24th March 2019 at Hotel Mariott Tankbund.

Inauguration of the CME was done by the dignitaries Secretary Dr. RoyaRozati Dr. Remu Mishra Executive member of IFS, Prof P.P. Reddy. Dr. Meera Raj Gopal. The CME program was divided into three sessions Shift from Gynecology to ART, Ethical Challenges & Daily Challenges, Shift from Gynecology to ART. An informative talk was given on Setting up of an IVF lab by Dr. Suvrachala Vardan Chokuri, Q C at an ART Centre was given by Dr. Charulata Chatterjee. Another informative talk was given on ICMR guidelines Part-I- Dr. Roya Rozati, Part II- Suvrachala Vardan Chokuri The session was concluded by Vote of Thanks By Dr. Krishna Leela

The academic activity was well organized & appreciated by all delegate

It was an interesting CME, well attended and appreciated. About 60 delegates attended it, both clinicians and Embryologists

**Activity 2**  
Environment and Reproduction in ART On 7th April 2019 at Hotel Mariott Tankbund

Inauguration by Dr. Roya Rozati, Dr. RS Sharma Executive member Secretary ICMR, Dr. Sweta Gupta and other IFS members. Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter.

**Activity 3**  
Messmerizing talk on Environment Toxins and Female Reproduction by Dr. Roya Rozati. Secretary IFS Telangana with an interactive session with queries addressed by the audience. The entire hall was spell bound by an enlightening talk on Interesting cases (Testicular Dysgenesis syndrome malformation, miscarriages etc, by Dr. Sweta Gupta. A talk was presented given on options and advances in air purification technologies by Mr. Dilip Patil. A talk on optimizing the culture environment in the IVF lab was given by Dr. Charulata Chatterjee. On 7th April CME was conducted on Environment and Reproduction in ART which focuses on the importance of Environmental chemicals exposure in men and women were associated with reduced fertility and a higher risk of adverse outcomes, whereas some dietary factors improved the probability of successful reproductive outcomes Dr. RS Sharma our chief guest of ICMR delivered a talk on biomagnetic and hazardous effects of mobiles on our reproductive health which now has scientific evidence. Vote of Thanks was given by Dr. Roya Rozati.

Around 60 gynecologists mostly from Telangana had participated in the CME.

**Tamil Nadu**

**Vision Statement**  
"Vision for IFS Tamil Nadu is to encourage research, broadcast educational information, and promote the advanced clinical care of patients in all aspects of reproductive medicine."

**Executive Committee**

**Secretary :** Dr. PM Gopinath  
**Joint Secretary :** Dr. Rajajiyaa Gopal  
**Treasurer :** Dr. Krishna Leela  
**Patrons :** Dr. Murughiabahini, Dr. Geetha Haripriya  
**Executive members :** Dr. Raveendran, Dr. A Charimila, Dr. Uma Maheswari, Dr. Kuthukula Devi, Dr. Rajajiyaa, Dr. Mani Lakshmi, Dr. Gayathri

**Activities 2019**

**Activity 1**  
Recent advances in ART - 17/3/19 Trident Hotel Chennai

**Activity 2**  
IFS Regular RTM-22nd Feb at Hotel Ramada, Eymore

**Activity 3**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 4**  
Muthamilnagar camp June2019

**Activity 5**  
NADI women infertility camp Madhavaram MARCH 8,2019 Women’s Day

**Activity 6**  
Male infertility SIG CME 23/6/19

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 7**  
IFS –GENETICS 17/5/19 CME

**Activity 8**  
IFS –IMA CME 23/6/19

**Activity 9**  
Genetics CME- LILAC insights

**Activity 10**  
IFS -TAMAR CME 23/6/19

**Activity 11**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 12**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 13**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 14**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 15**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 16**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 17**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 18**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 19**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.  

**Activity 20**  
CME at Hotel Park Hyatt, on 11th August 2019 in Banjara Hills, Hyderabad.

It was represented by Prof P.P. Reddy represented as Patron of the IFS Telangana Chapter. The program was jointly inaugurated by IFS Telangana Chapter Secretary Dr. Roya Rozati Joint Secretary Dr. Meera Raj Gopal and other dignitaries.
IFS Puducherry Chapter organized Annual CME at Annamalai International, Puducherry on 7.4.2019

Lectures delivered on:
1. DNA Fragmentation Index & its implication delivered by Dr. Siddharth, Porur, Chennai
2. Effectiveness of Oral Formulation on sperm DNA Fragmentation Pilot Study by Dr. Sayali Kandare, Mumbai.
3. Management of Varicocele in Infertile men – Current Consensus by Dr. Ashok Kumar, Chennai
4. Medical Management in Male Infertility by Dr. Raghuveeranda, K. Urologist & Andrologist, Hyderabad.
5. Management of Anejaculation by Dr. Kubera, Puducherry.
6. The programme was well attended by the Post Graduates and the practitioners of Puducherry and Tamil Nadu.

Chapter Secretary - Dr. Swati Verma

Vision Statement: “To deliver evidence based academic content in the field of teaching, learning and communication and participation. Motto is to impart quality education to our fellows and achieve excellence in the field of teaching, learning and research.”

Executive Committee
Patrons: - Dr. Umesh Jindal
Secretary: - Dr. Swati Verma
Joint Secretary: - Dr. Lavleen Sodhi
Treasurer: - Dr. Chitra T.
Advisors: - Dr. Sheetal Jindal, Dr. Bharti Joshi

Activity 1
SIPCON 2019-20 April 2019 at Chandigarh
Organizing chairperson - Dr Lovleen Sodhi
Organizing co-chairperson - Dr. Shalini Gainder

More than 200 Delegates

Dr. Abha Majumdar, Dr. Pankaj Talwar, Dr. Vinod Malhotra and other local faculty discussed various issues related to cryopreservation and updated current trends in male infertility management.

ACTIVITY 3
Genetics Conference “How to apply genetics in ART practice” Banja A Advance - 7th Oct 2018
Attended by more than 100 delegates.

Dr. Ratanpuri, Dr. Michal Richardson and Dr. Manisha Vapiyeey interacted with the delegates and highlighted about Anance screening, role of ART in genetic predisposition and case selection of PGD.

Chapter Secretary - Dr. Shilpi Sud

Vision Statement: “To sort out controversies in infertility management and come to consensus with clear understanding of subject. Aim is to create awareness regarding evidence based management of infertility. To reach every corner of Vidarbha”

Executive Committee
Secretary - Dr. Shilpi Sud
Joint Secretary - Nishad Chimote
Treasurer - Dr. Nandini Punjabi
Past Secretary - Dr. Rohini Dravid
Past Joint Secretary - Dr. Anjali Bhandarkar

Activity 1
CME on Cancer and Fertility on 18th March 2019 at Tuli Imperial, Nagpur
Dr. Anand Pathak, renowned Oncologist spoke on “Teratgy concerns in cancer patients” and highlighted the fact that not just the disease itself but the treatment modalities like chemotherapy, radiotherapy used for the cancer treatment may lead to sexual dysfunction, gonadal toxicity and impaired reproductive function in male and females. Dr. Sudha Patwardhan, IVF specialist on Clinical Aspect on infertility. Dr. Pankaj Talwar, National Secretary IFS delivered lecture on techniques on fertility preservation. Dr. Amol Dongre spoke on “Challenges in fertility management & need of proper counselling. Dr. Pankaj moderated panel on Facts and dilemmas of fertility preservation. Panelist were Dr. Dushana Pawar, Dr. Tanushree Jain, Dr. Nareesh Jadhav, Dr. Anita Salpekar, Dr. Bindi Chimote.

Patrons -
Dr. CharuRamade, Dr. Nischandra Chimote
Dr. Narendra Mehta, Dr. Rauji Khandelwal, Dr. Vinay Tule

Activity 2
Annual Conference of IFS Vidarbha Chapter. Fertiquest 2019
One day annual conference held 15th September 2019 at hotel Centre point Nagpur. Expert from all over India shared their knowledge. IFS President Dr. Geet Devi delivered lecture on “New Approach For Poor Responders.” First Late DeManul Jaimote Creation was delivered by Dr. PVF Specialist Dr. Manisha Deshpandey on “Managing Congential Genital Tract Abnormalities, My Experience Of 36 Years”. Dr. Kailash Jai Past President spoke on “Double Stimulation, Double Trigger, Double Transfer, Double Trouble?” Dr. KLN Nazar spoke on Explaining Unexplained Infertility. Conference was appreciated by faculty and delegates.

Executive Members -
Dr. Anup Chimote, Dr. Bindu Mehta Chimote, Dr. Chaitanya Shembekar, Dr. Dushana Pawar, Dr. Kancharn Soroy, Dr. Ritu Chimote, Dr. Sudhama Deshmukh

Activity 2
16th ART Update 25-27th May 2019
Preconference workshops
- Embryo- suturing
- Hystero- trainer
- IVF lab set up
More than 200 participants in each session. Debates
- Septum removal before ART
- D3 Transfer v/s blastocyst transfer

PUDUCHERRY

Chapter Secretary
Dr. Papa Dasari

Vision Statement: “The vision is to create awareness of fertility and related issues among the general public.”

Executive Committee
Chapter Secretary - Dr. Papa Dasari
Chapter H. Secretary - Dr. Ishita R.
Chapter Treasurer - Dr. Chitra T.

Activity 1
Fertivision 2020 in Chandigarh
Evidence based academic content
Vision Statement: “To deliver evidence based academic content to our fellows and achieve excellence in the field of teaching, learning and communication and participation.”

Activity 2
SIFCON 2019: 21 April 2019 at Chandigarh
Debates
- Septum removal before ART
- D3 Transfer v/s blastocyst transfer

GREATER CHANDIGARH

Chapter Secretary
Dr. Swati Verma

Vision Statement: “To deliver evidence based academic content in the field of teaching, learning and communication and participation. Motto is to impart quality education to our fellows and achieve excellence in the field of teaching, learning and research.”

Executive Committee
Patrons: - Dr. Umesh Jindal
Secretary: - Dr. Swati Verma
Joint secretary: - Dr. Lavleen Sodhi
Treasurer: - Dr. Chitra T.
Advisors: - Dr. Sheetal Jindal, Dr. Bharti Joshi

ACTIVITY 1
SIFCON 2019- 21 April 2019 at Chandigarh
Organizing chairperson - Dr. Lovleen Sodhi
Organizing co-chairperson - Dr. Shalini Gainder

More than 200 Delegates

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- Hystero- trainer
- IVF lab set up
More than 200 participants in each session. Debates
- Septum removal before ART
- D3 Transfer v/s blastocyst transfer

VIDHARBHA
KERALA

Vision Statement: “Our Mission: Our mission is to educate the reproductive healthcare personnel, to promote research and to encourage the superior quality healthcare for patients seeking fertility treatments. Our Vision: all women to have access to fertility treatments.”

Dr. KU Kunjimoideen
Chapter Secretary

Executive Committee

Chapter Secretary-Dr KU Kunjimoideen
Jt Secretary – Dr M Venugopal
Treasurar – Dr G Parasuram

Dr kk Gopinath, Dr Fessy louis,
Dr Ramgopal pillai
Dr Sankalp Singh,
Dr raju Nair, Dr Sheela Balakrishnan,
Dr G parasuram

PUBLIC HEALTH ACTIVITIES

ACTIVITY 1
CMO on infertility management and Fetal Anomaly Scan
IMA Perinthalmanna - Gynaecologists, Obstetricians, Urologists attended 72 delegates

ACTIVITY 2
CMO on Endometriosis and Fibroids
In association with OG Club
Mamakkkad41 Gynaecas participated

ACTIVITY 3
CMO on Maki infertility Management at Kottayam
Kerala Organised in association with IMA and Urology Club

ACTIVITY 4
CMO on what’s new in Infertility Management
Organised in association with Calicut OG Society & DMS73 Gynaecas attended half day CME Program

ACTIVITY 5
Projects
360 degree Andrology

ACTIVITY 6
Tribal Fertility Healthcare project

• 116 TRIBAL VILLAGES IN KERALA with an average population of 17,000-21,500 women of reproductive age age group in extreme poverty

• Aims
  - Women’s healthcare screening
  - Supply of healthy food
  - Reproductive care - Obstetric care
  - Fertility support

Project approved by Govt of Kerala and partially funded. Will be operational with the help of Reproductive Health committee of KFOG

ACTIVITY 7
Public Health Activities
Flood – Relief Activities

• Northern Kerala affected
  - 1800 plus families totally displaced

• 20 member team from IFS Kerala Chapter joined with IMA and local health admin and visited many camps and supplied medicines, food materials and dress items worth total 7 lakhs rupees

• Follow up activities are on place

ACTIVITY 8
Training programme for IVF Nurses

ACTIVITY 9
World Womans Day

A Seminar was conducted on reproductive health and importance of healthy food habits, hygiene and exercise for higher secondary school girls of Tharakani’s High School, Angadipuram in connection with observance of International Girl Child Day. Dr Kuchu S. Mani inaugurated the seminar. The seminar was conducted by IFS Kerala chapter, POCS and Malabar District Police. A sensitization about sexual atrocities and training on self defence were given by District Police Superintendent. More than 300 students participated in the seminar.

ACTIVITY 10
World Health Day

World Menopause Day was inaugurated by IFS Kerala Chapter Secretary, Dr Kunjimoideen at ARMG Aegis Hospital, Perinthalmanna. The seminar was organised on the subject ‘ Reproduction after 40’ and highlighted the proposed surrogacy bill etc. The medical camp was envisioned to raise awareness on the impact of menopause in women above 45 years of age. Bone Mineral density test, Ultrasound scanning and medicines are offered to the attendees free of cost.

ACTIVITY 11
Menstrual Hygiene Awareness Class

IFS Kerala Chapter in association with OG Society organised an awareness class on menstrual hygiene and menstrual disorders at Sui Snehatheram tribal hostal, PERINTHALMANNA on 8th October 2019. Dr Kochu S Mani delivered the lecture on the importance of menstrual hygiene and its impact on future reproduction. About hundreds of students were attended the class.

ACTIVITY 12
International Girl Child Day

ACTIVITY 13
World Menopause Day

ACTIVITY 14
CMO on Care of ART Pregnancy

IFS Kerala chapter has organised a CME on ‘Care of ART Pregnancy’ on 17th November at Perinthalmanna in association with local OG Society. Poovul Murugappan Pai from KMC Manipal, delivered the lecture. There was a panel discussion on ‘Case scenarios in ART Pregnancy’ moderated by Dr. Seneshkumar and Dr. Mumthaz. 88 delegates participated

Chapter in association with ARMC, AEGIS hospital, Perinthalmanna. The seminar was organised on the subject ‘ Reproduction after 40’ and highlighted the proposed surrogacy bill etc. The medical camp was envisioned to raise awareness on the impact of menopause in women above 45 years of age. Bone Mineral density test, Ultrasound scanning and medicines are offered to the attendees free of cost.
IFS Haryana Chapter First Annual Conference
Superbly arranged on 19th May at Hotel Leela Ambience. Conference was well attended by 360 infertility specialists & Gynaecologists from all over Haryana & Delhi NCR. Two hands-on workshops (IUl and Ovum pick-up/Embryo transfer) along with free paper session.

- Conference was inaugurated by Dr. Satish Aggarwal (DGHS Haryana) & Guest of honour Dr. Smiti Nanda (OD PGIMER Medical College Rohtak) and CMO Dr. K.K. Rajora.
- Academic session is backbone of any conference and our conference was academic bonanza with participation of almost all national faculty along with international speaker Mr. Jose Miravet from Spain to make it rich and satisfying experience for the delegates. It was an honour to have all stalwarts under one roof imparting the pearls of knowledge and wisdom and sharing recent updates & best clinical practices.

- Conference started with mesmerising panel discussion on “Azoospermia – What next?” by Dr. Pankaj Talwar and Dr. Priya Varshney. It gave clear guidelines, how to proceed in these males and what all need to be done. Our international expert Dr. Jose Miravet from Spain unravelled the role of endometrium in successful implantation.

- Wonderful panel discussions were conducted on “Ovulation induction - Different Case Scenario” by Dr. Neeru Thakral and Dr. Shalu Gupta. The discussion started from basic level to IUl then IVF cases so that every gynaecologist and beginners could understand dos and don’ts of ovulation induction. Final key points were highlighted by our expert advisor Dr. Sonia Malik.

- This was followed by plenary session with guest lecture by Dr. Harikeekai Pau on Testing and Editing of embryo followed by Key Note Address by Dr. Alka Krijplasion Ademmanjosi. Entire hall was spell bound by Presidential Oration by Dr. Gouri Devi on Vision – Future of ART.

- Post lunch video session by Dr. Kuldeep Jain and Dr. Dinesh Bansal gave insight on Fertility Enhancing surgeries. It was followed by debate on need of the day By Dr. Neena Malhotra from AIIMS and Dr. Vikas Swarnkar from IFS. Dr. Umesh Jindal gave insight by her talk on unexplained infertility and its management.

- IUl hands-on workshop was attend by almost 50 delegates and OPU & ET workshop (hands-on simulator) by 32 delegates. Dr. Shweta Mittal, Dr. Surveen Gugman, Dr. Rashmi Sharma, Dr. Ila Gupta, Dr. Neeru Thakral guided delegates by giving tips on various steps. CME was awarded by 5 ICOC credit point & 4 Haryana Medical Council credit Hours.

- Meeting was well covered by Press coverage like - Amar Ujala, Danik Bhasker, Danik Jagran. The academic activity was well organized & appreciated by all delegates.

Vision Statement: “Our main focus is on increasing awareness about infertility and IFS ideology among Gynaecologists as well as General population in Haryana.”

Executive Committee

Secretary - Dr. Neeru Thakral
Jt. Secretary - Dr. Shalu Gupta
Treasurer - Dr. Priya Varshney

Chapter Secretary

Dr. Neeru Thakral
MADHYA PRADESH

Vision Statement: “To start an initiative to tackle infertility in couples by offering evidence based medicine at an affordable cost”

Executive Committee

Secretary - Dr. Monica Singh
Jt. Secretary - Dr. Anju Verma
Treasurer - Dr. Asha Jindal
Executive Members -
Dr. Viraj Jaiswal, Dr. Abha Jain, Dr. Archana Srivastava, Dr. Manju Rathi, Dr. Sunita Pandey, Dr. Yatinder Verma, Dr. Gajender Tomar

ACTIVITY 1
The 1st CME was conducted in Hotel Lily in Gwalior
Organising Secretary Dr. M. Rahman

ACTIVITY 2
IUI Workshop was held on 22nd June in Dimapur, Nagaland
45 delegates participated in the hands on workshop. Dr. M. Belho was the organising chairperson. Speakers in the workshop included Dr. Gouri Dervi Dr. Umesh Jindal, Dr. Bapuli Basu, Dr. M. Rahman.

ACTIVITY 3
Another IUI Workshop was held on 23rd June in Kohima
20 delegates participated and there was a good discussion between the faculty and the delegates.

ACTIVITY 4
Awareness Programme on Reproductive Health 27th August
On 27th of August an awareness programme on Reproductive health was conducted in Beloda college. Dr. M. Rahman addressed the girl students. Around 350 girls attended the programme. There was a Q&A session after the talk.

GUJRAT

Vision Statement: “To Increase the No of IFS Members from Gujarat and provide Qualitative Academics and Learning programme to the Fraternity”

Executive Committee

Secretary - Dr. Mujibur Rahman
Jt. Secretary - Dr. Abhishek Shukla
Treasurer - Dr. Preesh Makwana
Jt. Treasurer - Dr. Hitendrasingh
Executive Members -
Dr. Sanjay Desai, Dr. Minakshithapa, Dr. Divyang Rasik, Dr. Bhavish Thakkar, Dr. Bhavish Prajapati, Dr. Jaya Goyal, Dr. Bhumikta Rathod, Dr. Yuh Melms, Dr. Ranjita Khorasani Dr. Amil Shah & Dr. Preesh Patel

ACTIVITY 1
The 1st CME was conducted in Hotel Lily in Guwahati
Organising Secretary Dr. M. Rahman

ACTIVITY 2
IUI Workshop was held on 22nd June in Dimapur, Nagaland
45 delegates participated in the hands on workshop. Dr. M. Belho was the organising chairperson. Speakers in the workshop included Dr. Gouri Dervi Dr. Umesh Jindal, Dr. Bapuli Basu, Dr. M. Rahman.

ACTIVITY 3
Another IUI Workshop was held on 23rd June in Kohima
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ACTIVITY 4
Awareness Programme on Reproductive Health 27th August
On 27th of August an awareness programme on Reproductive health was conducted in Beloda college. Dr. M. Rahman addressed the girl students. Around 350 girls attended the programme. There was a Q&A session after the talk.

MADHYA PRADESH

Vision Statement: “To start an initiative to tackle infertility in couples by offering evidence based medicine at an affordable cost”

Executive Committee

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Mujibur Rahman

Chapter Secretary
Dr. Jayesh Amin

Chapter Secretary
Dr. Mujibur Rahman

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Mujibur Rahman

Chapter Secretary
Dr. Monika Singh

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Monica Singh

Chapter Secretary
Dr. Monica Singh
PUNJAB

Chapter Secretary
Dr. Harinder Kaur Oberoi

Executive Committee
Secretary - Dr. Harinder Kaur Oberoi
Vice Secretary- Dr. Sukriti Bansal
Treasurer - Dr Sarabjeet Singh
Executive Members
Dr Sarabjeet Singh
Dr Juslin
Dr Shweta Mittal
Dr Sarabpreet Singh
Dr Lakhjeet Dhalwals
Dr Sarla Malhotra
Dr Dev Khulbe
Dr Priyanka Chopra

IFS Punjab chapter organized a CME in collaboration with Sun Pharma on 6th of June 2019 at Ranjit Avenue Amritsar from 11am to 3pm. List of organizing committees Dr Harinder Kaur Oberoi, Dr Sarabjeet, Dr Archana Berry, Dr Jyotspal. Name of speakers Dr C Nagori, Dr Sonal Panchal from Ahmedabad, Dr Jyotspal and Dr Sarabjeet Singh. Worthy Speaker Dr C Nagori highlighted on “Role of progesterone in luteal phase defect” Dr Sonal Panchal discussed on “Spermomicsology” Dr Sarabjeet delivered lecture on diagnosis of PCOS. Dr Jyotspal Gupta highlighted on chromosomal defect by sonograph. All topics were very interesting and informative. All lectures appreciated and applauded by faculties and all the delegates of Amritsar.

IFS Punjab chapter in association with IFS organized a conference on infertility updates and ART workshop on 22nd September 2019 at Harpal Tiwana Hall at Patiala.

Organizing Committee - chairperson Dr Harinder kaur Oberoi and Dr Sarita Agrawal
Organizing Secretary Dr Monica Verma & Dr Ranjana Joint Organizing Secretary: Dr Sarabji, Dr Shalini and Dr Sarabpreet Singh.

Workshop Coordinator: Dr Deepa Goel, Dr Sukriti and Dr Juslin

Guest Speakers: Dr K D Navar, Dr Surekha Ghueman, Dr Umesh Jindal, Dr Shreeta Mittal, Dr Sarabpreet Singh, Dr Lakhjeet Dhalwals, Dr Sarla Malhotra, Dr Manjot Mohi, Dr Shalini Gauhardev, Dr Lekhpreet Sohli. 215 delegates and 35 faculty members attended the conference. There were discussions excellent with good interactions. Punjab medical council granted 4 CME hours. This was a wonderful gathering from all over North. Topics and discussions were excellent with good interactions.

Dr Monica Varma from Punjab Chapter IFS presented a poster at ESHRE 2019.

Higher risk of preclampsia in singleton pregnancies from donor versus autologous oocytes, with similar endometrial preparation, in a healthy, young cohort: a prospective study. She had also suggested seven points for the ESHRE 2019 Guidelines for Good Practice Recommendations for Ultrasound and in ART. Oocyte Pick-up and all 7 were accepted in the final guidelines. Her name is in the Reviewers List of these guidelines.

ACTIVITY 1
IUI work shop on 28th April 2019 at Jalandhar

Under the expert guidance of our esteemed leadership of IFS general secretary and president Dr Dr. Parveen Devi madam, IFS Jalandhar chapter conducted Annual conference on Fertility Concepts at Jalandhar and IUI work shop on 28th April 2019. For the conference and IUI work shop honorable Punjab Medical Council granted us 8 credit hours. Worthy Speakers from Delhi Dr Pankaj Talwar highlighted on “Ultrasound in infertility” Dr Neema Malhotra gave deliberation On optimization outcome improper responders “ Dr Sonia Malik through light on “ovulation induction in obese Pros and Noncos “ Dr Umesh Jindal very well discussed “Trouble shoots in IUI and embryo transfer “ Dr Akshambha from Shima threw light on Endometriosis updates “Dr Anuradha from Jammu highlighted on pearls of wisdom in treating infertility with out ivf “ mD HarinderKaur Oberoi discussed latest tips on “Repetged implantation failure “ “Solving mysterious thin endometrium “ was dealt by Dr Rummy from Chandigarh. Many points on “practical dilemmas in infertility management “ were discussed by experts panelists. One more panel on Tips and Tricks in achieving faster success rate infertility management “ was discussed in detail. Efforts of IFS Punjab chapter appreciated and applauded by faculties and all the delegates. They learnt many newer advances in management of ART.

ACTIVITY 2
CME - 16th of June 2019 at Ranjit Avenue Amritsar

IFS Punjab chapter organized a CME in collaboration with Sun Pharma on 6th of June 2019 at Ranjit Avenue Amritsar from 11am to 3pm.

List of organizing committees Dr Harinder Kaur Oberoi, Dr Sarabjeet, Dr Archana Berry, Dr Jyotspal.

Name of speakers Dr C Nagori, Dr Sonal Panchal from Ahmedabad, Dr Jyotspal and Dr Sarabjeet Singh.

Worthy speaker Dr C Nagori highlighted on “Role of progesterone in luteal phase defect” Dr Sonal Panchal discussed on “Spermomicsology” Dr Sarabjeet delivered lecture on diagnosis of PCOS.

Dr Jyotspal Gupta highlighted on chromosomal defect by sonograph. All topics were very interesting and informative. All lectures appreciated and applauded by faculties and all the delegates of Amritsar.

ACTIVITY 3
Conference on Infertility Updates & ART Workshop 22nd September 2019 at Harpal Tiwana Hall at Patiala

Organizing Committee - chairperson Dr Harinder kaur Oberoi and Dr Sarita Agrawal

Organizing Secretary Dr Monica Verma & Dr Ranjana Joint Organizing Secretary: Dr Sarabji, Dr Shalini and Dr Sarabpreet Singh.

Workshop Coordinator: Dr Deepa Goel, Dr Sukriti and Dr Juslin

Guest Speakers: Dr K D Navar, Dr Surekha Ghueman, Dr Umesh Jindal, Dr Shreeta Mittal, Dr Sarabpreet Singh, Dr Lakhjeet Dhalwals, Dr Sarla Malhotra, Dr Manjot Mohi, Dr Shalini Gauhardev, Dr Lekhpreet Sohli. 215 delegates and 35 faculty members attended the conference. It attended the Hysteroscopy workshop and 23 attended the IUI and RT workshop. This was a wonderful gathering from all over North. Topics and discussions were excellent with good interactions.

Punjab medical council granted 4 CME hours. There was a good panel discussion which was appreciated by audiences and faculty members. Topics- free papers, unexplained infertility, panels on fibroids and male infertility, PGD. In aneuploidy, ovulation induction, first trimester treatments of IVF pregnancy, pregnancy in art workshop and Hysteroscopy, OPF and embryo transfer, vitrification and cryobiology workshop were discussed in detail. Panels and Hysteroscopy workshop appreciated by delegates.

Whole conference was enjoyed and applauded by all the faculty and delegates.

ACTIVITY 4
CME on 1st Navrata day at Jalandhar
Hotel Ramada encore conducted on 29th September 2019 from 9 to 2pm.

A CME on 1st Navrata day at Jalandhar Hotel Ramada encore conducted on 29th September 2019 from 9 to 2pm. 40 delegates participated including Embryologist. Attendance good with good discussion and exchange of views. Very good informative and interactive topics.

ACTIVITY 5 & 6
2 Camps Organized

S.no. Date Venue Patients Seen
1 Oct 2018 Sultanpur Lodhi 106
2 March 2019 Badh Sikhj Jalandhar 50

IFS Punjab chapter in association with PGOS organized a conference on infertility updates and ART workshop on 22nd September 2019 at Harpal Tiwana Hall at Patiala.

Dr. Monika Verma

IFS Conversations (Volume : 10)
RAJASTHAN

Dr. Sangita Sharma
Chapter Secretary

Vision statement: “Strengthening the chapter by increasing the number of members. Aims of increasing awareness on infertility issues: Updating on recent evidence-based approaches. Benefiting the society by planning awareness programmes (e.g., PCOS in schools/colleges) and first OPDs (e.g., in rural areas)/strengthening Embryology part in the state.”

Executive Committee

Patron: Dr. M. L. Sonawat
Advisors: Dr. Neelam Bhatia, Dr. Sanjay Makwana
Secretary: Dr. Sangita Sharma
Joint Secretary: Dr. Nidhi Kabra
Executive Members: Dr. Usha Shekhawat, Dr. Narendra Gupta, Dr. Anita Sharma, Dr. Sunita Yogi, Dr. Aakriti Bhandari, Dr. Harpreet Bajwa, Mr. Rahul K Sen

WEST BENGAL

Dr Suparna Banerjee
Chapter Secretary

Vision Statement: “To increase awareness of infertility problems and early referral of couples to specialised fertility clinic. Increase IFS members in west Bengal.”

Executive Committee

Secretary: Dr. Suparna Banerjee
Joint Secretary: Dr. Priyanka Ray
Treasurer: Dr. Pushpa Ray
Executive Members: Dr. Popy Ganguly, Dr. Debashree Ganguly, Dr. Madhumita Roychowdhury, Dr. Sudip Bose, Dr. Madhab Das, Dr. Ashani Samal, Dr. Sunita Sharma

UP (EAST)

Dr. Renu Makkar
Chapter Secretary

Vision Statement: “To engage and involve gynaecologists of UP in understanding importance of infertility management and management of ART pregnancies.

To develop simple protocol systems for investigation, diagnosis, and management of infertile couples in a structured manner in order to save time and energy, reduce time to pregnancy and financial burden.”

Executive Committee

Chief Patron: Dr. Chandrawati
Secretary: Dr. Renu Makker
Assistant Secretary: Dr. Sandeepa Kareem
Treasurer: Dr. Mamta Shukla
Executive Council: Dr. Malvika Malhotra, Dr. Geeta Khanna, Dr. Manju Shukla, Dr. Mamta Dighe

ACTIVITY 1:
CME on “Updates on Embryology” (30th March, 2019 at Jaipur)

Attended by 40 Clinicians & Embryologists.

First Talk: Trouble Shooting in IVF lab: Different Case Scenarios by Dr. Sangita Sharma

Second Talk: Evidence on Newer Technologies in IVF lab by Dr. Rahul K Sen, Senior Embryologist, Jodhpur

ACTIVITY 2:
RTM of IFS Rajasthan Chapter

Agenda: Discussion on PCPNDT issues and different forms (After FOGSI lost the case regarding PCPNDT issues in Supreme Court)

* 8.04.2019, Jaipur *Attended by 14 members of IFS.

ACTIVITY 3:
RTM - Recent Updates in Management of PCOS (16 May 2019 at Jhunjhunu)

Attended by 21 Doctors from Jodhpur, Pilani, and Churu.

ACTIVITY 4:
Infertility Awareness & Free Consultation Camp & Talk (16 May 2019 at Jhunjhunu)

* Attended by 21 Patients

ACTIVITY 5:
CME on Updates on Ovulation Induction (26th May 2019 at Jaipur)

Attended by 20 Doctors from Jaipur.

Meyer IFS Initiative 29th September: Inauguration and lamp lighting was done along with Rabindra Sangeet.

The meeting was blessed by Geeta Ganguly, a very senior colleague of Prof BN Chakraborty. Speakers were renowned Gynaecologists of Kolkata.

Dr. Kaushiki Ray, Dr. Indrani Lodh, Dr. S. Chatterji, Dr. SM Rehman, Dr. Mamta Dighe from Pune.

ACTIVITY 6:
CME on Updates on Ovulation Induction (26th May 2019 at Jaipur)

Attended by 20 Doctors from Jaipur.

Chief guest was Dr BN Chakraborty, we felicitated him. Our guest speaker was Dr. Vineet Malhotra. Our whole team was present with all the fertility specialists from Kolkata were present along with many eminent Gynaecologists of Kolkata were present.

IUI workshop was a hit among our junior colleagues.

ACTIVITY 1:
TVS Workshop - March 2019

- Attended by 10 PG students, 2 junior gynaec practitioners, one senior gynaecologist.
- Encouraged juniors to become life members and informed the training courses organised by IFS.

ACTIVITY 2:
Round Table Meet - April 2019

- Core committee members
- Plan for regional conference
- Plan for public awareness programme
- Plan for regular update programme and journal club

ACTIVITY 3:
Regional Conference - July 2019

- Attended by 20 Doctors from Jhunjhunu, Pilani, and Chairawa

ACTIVITY 1:
IFS Annual CME on 27th April, 2019

32 IFS Conversations (Volume : 10)
Vision Statement : "To create awareness among the general masses. Bridging up the gap between general public and professionals. Promote a forum for the exchange of ideas and information. To update the knowledge and skill of health professionals through continued method education by organizing workshops, conferences and CMEs on regular basis. To promote and grant recognition to research in the field of ART. To make IFS Chapter visible to common mass. Research Projects

• Role of Real Time PCR to diagnose Genital Tuberculosis in infertile women- concluded that the role of Real Time PCR is not very certain in diagnosis of Genital Tuberculosis in infertile women.
• Ultrasonography and Doppler study to predict uterine receptivity in infertile patients undergoing embryo transfer - ongoing project.
• Study of sperm morphology and motility using Strict criteria as a prognostic factor in Intrauterine Insemination- on going project.

Executive Committee

Secretary - Dr J K Goel
Joint Secretary - Dr Nutan Agrawal
Treasurer - Dr Ruchita Goel
Executive Council
Dr Lata Agrawal, Dr Nitin Jain
Dr Poonam Goyal, Dr Anshu Jindal
Dr Shashi Bali Arya, Dr Iyoti Bhaskar
Dr Shashi Singh

ACTIVITY 1
Infertility Summit 2019- 24th February 2019

Attended by around 120 delegates from different parts of Uttar Pradesh and Uttarakhand.

ACTIVITY 2
Setting up an ART Lab- 21st April 2019

Research Projects

• Study of sperm morphology and motility using Strict criteria as a prognostic factor in Intrauterine Insemination- on going project.

Vision Statement : "To create awareness among the general masses. Bridging up the gap between general public and professionals. Promote a forum for the exchange of ideas and information. To update the knowledge and skill of health professionals through continued method education by organizing workshops, conferences and CMEs on regular basis. To promote and grant recognition to research in the field of ART. To make IFS Chapter visible to common mass."

Executive Committee

Patron - Dr. (Prof) Abha Singh
Secretary - Dr. Sangeta Sinha
Joint Secretary - Dr. Sangeta Sinha
Treasurer - Dr. Prakrati Verma
Executive Members
Dr. Vipin Vaidya, Dr. Pratik Gwalani, Dr. Shilpa Gogate, Dr. Anuradha Tiberewal, Dr. Shilpa Singh

ACTIVITY 1
Reaching The Outreach

Adopting two villages will be the doing free check up of infertile patient on monthly basis

ACTIVITY 2
Social Contribution

Dr Manoj Chelani our Founder Secretary is doing free checkup once a month. Dr Veronica Yule our joint Secretary is doing free checkups

ACTIVITY 3
Awareness Programme

PCOS awareness programme for general practitioners. Knowledge sharing activity is done every month in collaboration with The Srijan Bhilai Test Tube Baby Center

ACTIVITY 4
PCOS Awareness Programme

PCOS awareness programme under the aegis of IFS CG chapter at The Srijan Bhilai Test Tube Baby Center on 13th April 2019

ACTIVITY 5
Training

Adopting two villages will be the doing free check up of infertile patient on monthly basis
**UTTRAKHAND**

**Vision Statement:** “Conduct CMEs to train doctors & paramedical staff. Conduct Conferences to update knowledge of recent advances in infertility. Organize awareness Camps for patients in remote regions of Uttrakhand to start investigations early.”

**Executive Committee**
- **Patron:** Dr. Pankaj Talwar
- **Secretary General IFS:** Dr. Sumana Gurunath
- **Bengaluru:** Dr. S.M. Rahman
- **Kolkata:** Dr. Aditi Gupta
- **Dehradun:** Dr. Arti Marwah Luthra, Dr. Chitra Joshi, Dr. Anupama Bahadur

**ACTIVITY 1**
Infertility Camp under aegis of IFS (31st March 2019 at Muzaffarnagar)

- Dr. Pankaj Talwar Secretary General IFS
- Dr. Sumana Gurunath, Bengaluru, Dr. S.M. Rahman, Kolkata, Dr. Aditi Gupta, Hardwar, Dr. Arti Marwah Luthra, Dehradun, Dr. Chitra Joshi, HoD Doorn Medical College, Dehradun, Prasad Senior Consultant IVF, Rishikesh, Dr. Archana Tandon Associate Professor SGRR, Dehradun

**Poster presentation by Junior Residents from AIMS Rishikesh, SGRR Dehradun & Himalayan Hospital well appreciated by Judges**

**KASHMIR**

**Vision Statement:** “We hope to do public awareness camps, andrology and ultrasound workshops and more CME this year. We are proud to be a part of academically rich IFS.”

**Executive Committee**
- **Patron:** Prof. (Dr) Shahnaz Teng
- **Advisor:** Prof. (Dr) Aabida Ahmed
- **Spokesperson:** Dr. Samiya Mufti
- **Jt. Secretary:** Dr. Ambreen Qureshi
- **Treasurer:** Dr. Gulshar Ara

**ACTIVITY 2**
CME under aegis of IFS “Basic Essentials for Fertility” (14th April 2019 at AIIMS, Rishikesh)

**NEPAL**

**Vision Statement:** “We hope to do public awareness camps, andrology and ultrasound workshops and more CME this year. We are proud to be a part of academically rich IFS.”

**Executive Committee**
- **Patron:** Dr. Rita Bakshi
- **Advisor:** Dr. Uma Srivastava
- **Secretary:** Dr. Rashmi Shirish
- **Jt. Secretary:** Dr. Mira Thapa
- **Treasurer:** Dr. Swasti

**ACTIVITY 3**
Annual CME at Seyfert Sarovar Premiere on 6th October, 2019 in Dehradun, Uttarakhand on “Optimization of Ovarian Stimulation”. It was jointly inaugurated by the National Coordinator of IFS, Dr. Neena Malhotra, Dr. Shweta Mittal, Dr. Neeti Tiwari and Dr. Anupama Bahadur

**IFS Nepal Chapter hosted their Annual CME at Pokhara on 29th March 2019. IFS were represented by the treasurer Dr. Neena Malhotra prof. AIIMS & Dr. Rita Bakshi - Patron of the IFS Chapter Nepal. Pokhara has around 50 gynecologists and we are glad to inform our turn out was around 50 with a few doctors from Kathmandu, Butwal and Biratnagar also. In fact according to Pokhara doctors it was a rare day with nearly all doctors except a few on Call/Duty not attending.**

1. Dr. Uma Srivastava - History of IVF in Nepal
2. Dr. Kanchan Prasad - Asst. Prof. TMHC, Mordabad spoke on Gestational Tuberculosis.
3. Dr. Rita Bakshi - Patron IFS Nepal Chapter spoken unexplained infertility.
4. Dr. Neena Malhotra - Prof. AIIMS Ovulation Induction followed by
5. Dr. Asima - Fibroids & Endometriosis in infertility

IUI workshops were attended by the entire 50 gynecologist and practical demonstration of Sperm Washing & IUI procedure was done. 8 out of 50 people became IFS members there itself and also paid up.

**Annual CME at Pokhara on 29th March 2019**

- **Panel on Male Infertility Moderators:** Dr. Rita Bakshi, Dr. Kanchan Prasad
**Vision Statement:**
"To make the state of art infertility treatment services to people of Jharkhand so that they don’t need to move to Metro cities, thus preserving their valuable time and money. Also create awareness about fertility services outreach every district of Jharkhand."

**Executive Committee**
- President: Dr. Karunajo Banerjee
- Secretary: Dr. Sunita Jha
- Treasurer: Dr. Shashidhara Singh
- Executive Council: Dr. Goutam Dey, Dr. Swati Tripathi, Dr. Goutam Mitra

**Vision Statement:**
"Creating awareness regarding infertility and creating awareness regarding male infertility."

**Executive Council:**
- Dr. Deepthi Shalini
- Dr. Ravella Sowjanya
- Dr. P. Himabindu
- Dr. J. Sowjanya Kumari

**Learning Point:**
1. Classical understanding of semen analysis (WHO-2010), male factor infertility.
2. Methods of semen preparation for IUI.
3. Evidence based practice in IUI.

**Comments from audience:**
- "A very interesting and captivating workshop which gave everyone a chance to understand the very basis of IUI and semen analysis." — Dr. Sumanta Sinha
- "A new insight to old topic" — Dr. Soumya Sinha

**Executive Committee:**
- Secretary- Dr. Poshray, Dr. Sashibala
- Dr. Durga Kuma, Dr. Puja Rani
- Dr. P. Pratibha, Dr. Siddhala

**West Maharashtra**

**Vision Statement:**
Making quality Reproductive Medicine and IVF training available to Gynaecologists, along with training postgraduates and creating awareness regarding increasing burden of infertility.

**Executive Committee**
- Secretary: Dr. Mantra Dighe
- Treasurer: Dr. Sushma Darwala
- Executive Members: Dr. Bharti Dhorepatil, Dr. Nitin Lad

**Activity 1:**
Annual Conference of Western Maharashtra Chapter of IFS, 13th and 14th July 2019 at Hotel Hyatt, Pune

Attended by over 350 delegates/100 eminent faculty from all over the Nation 2 orations, Semen Analysis oration by Dr. Jinath Shah and in vitro fertilization oration by Dr. Purnima Pathik 4 targeted workshops:
- Ovulation Induction and COH
- IUI and IVF lab setup
- Male Infertility and IUI
- Recurrent Implantation Failure

Panel discussions were held on various topics such as USG in Infertility, Endometriosis, Management of PCOS, etc., which had a very interactive discussion. The Chief Guest was Prof. Dhruv Dowerak, Prof. of Chemistry and well known Nutritionist. She spoke on Diet and Fertility and the impact food can have on increasing infertility. The program was well appreciated and the faculty was extremely well chosen and were authorities in their field. It was a very interactive and held the utmost attention of the audience. A case based panel discussion on secondary subfertility was moderated by Dr. Archana Kumari, Dr. Sunita Jha being the co-moderator. Panelists were infertility specialists of Ranchi-Dr. Sudhika Singh, Dr. Niromal Singh, Dr. Bupashwar Pruthobh, Dr. Sakshi Singh. Expert inputs were made by Dr. Karuna Jha and Dr. Pankaj Talwar. The programme ended with vote of thanks proposed by Dr. Archana Kumari, Secretary Jharkhand Chapter.

**Activity 2:**
IFS WMC organized Masterclass on Infertility for the postgraduate students

The intention was to expose the postgraduate students to practical infertility practice.

Four modules were created:
- Female Infertility
- Male Infertility
- Controlled Ovarian Stimulation and IUI
- IVF and Recent advances.

Lectures and in-depth discussions on all aspects right from pathophysiology to work up and management were discussed. The highlight of the sessions were the Panel Discussions, which had the postgraduates participate as panelists and a senior faculty presided as the Expert. The students enjoyed the active participation and got the opportunity to participate and experience as panelists.

**Activity 3:**
Practical session on Laboratory aspects of Semen Analysis and Semen Preparation taken at IVF Centre, Armed Forces Medical College.

Over 40 participants attended and all practical tips and methods were taught to them. CMEs are planned in January and February in Pune and nearby cities like Ahmednagar and Nashik.

**Activity 4:**
CME on luteal phase support on 24/03/2019

**Karnataka**

**Vision Statement:**
"To make state of art infertility treatment services accessible to the poor and unreached.

**Executive Committee**
- Secretary: Dr. Usba Prasad
- Treasurer: Dr. Sushma Darwala
- Executive Council: Dr. Goutam Dey, Dr. Swati Tripathi

**Activity 1:**
CME on Ovulation Induction and COH on 24/03/2019
- Total number of faculty: 10
- Total number of delegates: 43

**Activity 2:**
CME on Luteal phase Support on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 64

**Activity 3:**
CME on Ovulation Induction on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 64

**Activity 4:**
CME on Practical tips on Ovarian stimulation on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 77

**Andhra Pradesh**

**Vision Statement:**
"To make state of art infertility treatment services accessible to the poor and unreached.

**Executive Committee**
- Secretary: Dr. Usba Prasad
- Treasurer: Dr. Sushma Darwala
- Executive Council: Dr. Goutam Dey, Dr. Swati Tripathi

**Karnataka Conversations (Volume: 10)**

**Activity 1:**
CME on Ovulation Induction and COH on 24/03/2019
- Total number of faculty: 10
- Total number of delegates: 43

**Activity 2:**
CME on Luteal phase Support on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 64

**Activity 3:**
CME on Ovulation Induction on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 64

**Activity 4:**
CME on Practical tips on Ovarian stimulation on 29/09/2019
- Total number of faculty: 10
- Total number of delegates: 77
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Folic Acid 1 mg
Vit A 5000 I.U
Vit D3 500 I.U
Vit E 25 I.U
Zinc Oxide 15 mg
Cupric Oxide 2.5 mg
Sodium Selenate 50 mcg
Manganese Chloride 1.4 mg
Chromium Chloride 65 mcg

Infertile couple
Male Infertility
Prostate Cancer
Pre-eclampsia & IUGR
Uterine Fibroid Tumors
Habitual & Spontaneous Abortion

Tackles complicated conditions.... naturally