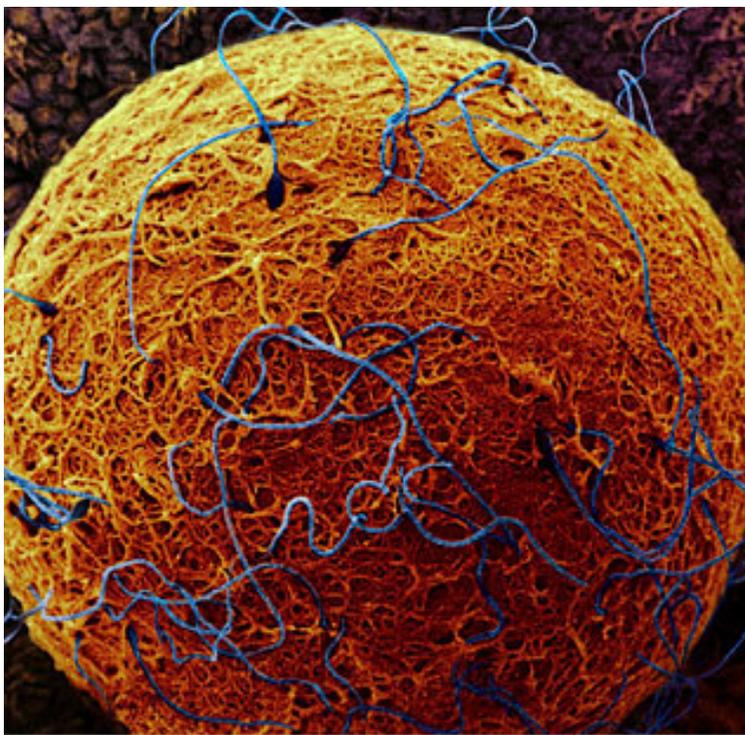




# IFS

## CONVERSATIONS

Volume 6 : December, 2018



## POOR OVARIAN RESPONSE

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## MESSAGE FROM THE PRESIDENT DESK

**DR GOURI DEVI**  
President - IFS



Dear Friends,

It is indeed a pleasure to address you all on this issue of IFS Conversations which is being released after the new executives have taken over. After the very successful “**Fertivision 2017**” held in Delhi, we have been busy. Our vision is to “**Out reach and Empower the Doctors**”. This inturn will empower the patients. Out of about 25 million infertile couples in India, hardly 1% has access to infertility treatment. Many a time these patients do not get the proper guidance due to ignorance.

From the time we have taken over in April, we have added 4 more chapters thus making 23 chapters all over India and 1 overseas in Nepal. We have added 300 more members. Our “Fertility Preservation Navigator” had 8 meetings all over india enlightening the doctors on this subject, held by eminent faculty and attended by eager delegates.

Our outreach programme has taken us to a lot of 2<sup>nd</sup> and 3<sup>rd</sup> tier cities and we have done these meetings with the active participation of our 13 SIG groups on various topics like Cryobiology, IUI, PCOS. We had succesful meetings on Setting up of ART lab, QC, QA Of LAB, YOGA in ART and we could outreach into places like Dhimapur and Kohima. These meetings are still going on in different parts of India. Webnar Conducted by Dr. Nutan Jain (Chair, SIG on Endoscopy on 13.10.18. The Myomectomy Master class was a huge Success with 300 doctors logging on.

**Fertivision 2019 is being held in Kochi this year from 14-16<sup>th</sup> of December** with a galaxy of speakers from India and abroad and I invite all of you to attend the same and send free communication papers and the post graduates to attend the quiz. We have started besides the E.bulletin, “**Catalyst**” Cochrane series which deals with 1 review article every month. ‘**Nexus and ARText**’ are our focussed bulletins on individual topics written with great care by experts. We have just finished Our IFS Pathshala, 1 day master courses and we are getting ready for the second one in January.

It is our great pride that for the first time, ESHRE conducted a campus meeting with IFS in Delhi on 16th september, 2018, and we had 350 delegates from all over India. This year again we will be conducting the ESHRE certification course from 11-13<sup>th</sup> december in Delhi.

In this news letter we have dealt with “**Poor Ovarian Response**” and Dr. Surveen Ghumman and her team have worked very hard towards it. Hope you all will find it very useful.

Wishing you all a very Happy New Year!

**Dr M. Gouri Devi, M.D**

## IFS SPECIAL INTEREST GROUP (SIG 2018 - 2020)

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# MESSAGE FROM THE SECRETARY'S DESK



**DR (PROF) PANKAJ TALWAR**  
Secretary General - IFS

Dear Friends,

Indian Fertility Society (IFS) has progressed over the past few years with more than **2200 members and 23 chapters**. It is an internationally affiliated organization engaged in training and educating clinicians and embryologists by organizing CME, workshops and seminars. Our publication wing also regularly brings out **E- Bulletins Nexus and ARTeXt and our flagship newsletter IFS Conversations**.

The previous conversation focused on **“Endometriosis”** and was appreciated by all. I congratulate the Editorial Board on its tireless efforts in bringing out this newsletter of **“Poor Ovarian Reserve”**. In the last two decades, the ovarian stimulation regimens have undergone significant modifications and improvements as a consequence of increased clinical experience and the availability of new hormonal preparations and adjuvant therapies. Not with standing overall increased pregnancy rates in IVF, a large group of patients referred to as **“poor responders”**, consistently show from sub-optimal to much compromised outcomes, both in terms of oocyte recovery and pregnancy rates. These patients are typically women of advanced maternal age and with a diminished ovarian reserve. But in addition, there are younger **“poor responders”**, some with identifiable and others with non-identifiable causes, and all of them constitute a formidable challenge for the reproductive endocrinologist.

Age is an established indicator of poor response as with advancing age there is depletion of primary oocytes. Apart from age, endometriosis and prior pelvic surgery also could be used as predictors for poor ovarian response. Above all, heredity also plays a major role and needs to be investigated further. Through this edition of newsletter, the Editorial team has tried to answer all the queries related to **“Poor Ovarian response”** by providing in depth information and keeping us all updated with the recent advances in the field contributed by experts across the country.

I will also take this opportunity to welcome you all to the 14<sup>th</sup> Annual National IFS Conference, FERTIVISION 2018 at Kochi, where all the clinicians and embryologists not only learn but also share their experience and present their scientific work.

I hope this issue makes an interesting read for you and wish you all a very Happy New Year.

**Dr(Prof) Pankaj Talwar**

**IFS MEMBERSHIP Benefits At A Glance**

- Pan India Society
- Collaboration with ESHRE & IFFS
- 2200 Members & 23 Chapters
- National Conference FertiVision every year with reduced registration fees
- Special Interest Group (SIG) for IFS Members to show case their talent
- Research Wing of IFS has its own ethical committee for Research Project approval
- Publication Wing - Fertility Science & Research Journal
- IFS Fellowship Program in Clinical ART & Embryology in collaboration with Assiety University
- ESHRE Certified Embryologist Examination in India, conducted by IFS every year
- IFS Outreach activities all over India
- IFS Master Courses
- Free access to IFS E-Publishing contents and Official Journal
- IFS E-Publishing - IFS Conversations, Nexus, ARTeXt, Fertility News, CATALYST

**Offline Registration Form**

Download the form and send to the secretary with recent pic and cheque/draft.

\* Please make Cheque / Draft in favour of "INDIAN FERTILITY SOCIETY" payable at New Delhi.

\* Please attach two recent passport size photographs.

Who can apply for IFS Membership: All Professionals with postgraduate qualification in Special Obstetrics & Gynaecology, Clinical embryology, androgynology, ultraecologists, nurses/nurses, geneticists and other involved in the care of fertility patients.

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**INDIAN FERTILITY SOCIETY**

**Online Registration Process**

- STEP 1** Open IFS website ([www.indianfertilitysociety.org](http://www.indianfertilitysociety.org))
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- STEP 3** Fill all the details.
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# MESSAGE FROM THE EDITOR'S DESK



**DR SURVEEN GHUMMAN**  
Editor - IFS



**DR SHWETA GUPTA**  
Jt. Editor - IFS

Dear Friends,

Greeting from team IFS!

We are presenting a very important topic which infertility and IVF specialist face in day to day practice, “ Poor ovarian response and how to tackle it”. The opening topic is on the role of AMH testing in assessing ovarian reserve. Moving further on in this issue of IFS bulletin, we have elaborated the newer classification of poor ovarian responders in IVF. Till now the most commonly practised classification for poor ovarian responder has been the BOLOGNA criteria. However, it does not quantify the poor responders and fails to identify those patients who apparently have a normal ovarian reserve parameters, still during ovarian stimulation suddenly show a poor ovarian response in terms of low oocyte recovery in IVF. So as to tackle this issue, POSIEDON group identified four such sub categories of patients and have classified them separately. This classification will further help in individualising treatment protocols as per the category in which patients fall showing poor ovarian response to standard form of treatment.

In women with PCOS some times there is a sudden low response to the stimulation protocol, the reasons and therapy of which has been elaborated in detail in this bulletin. No topic can be complete if different strategies to tackle poor ovarian response is not covered. We present a case report of a new method to optimize embryo formation and shorten time to pregnancy in poor responders called DUO STIM. Different adjuvants which are being prescribed to poor responders have been elaborated in detail. Lastly it is very important to discuss the embryologists perspective when dealing with patients showing poor ovarian response and low oocyte yield, which have been very smoothly covered in this present bulletin. We have comments from our experts in the field Dr Abha Majumdar and Dr Umesh Jindal on how they manage poor ovarian reserve – a practical aspect of do’s and don’ts

Over the years IFS has evolved into not just an strong academic society but has become a society with a social cause, one with a purpose to educate right from basics to superspeciality – a spectrum in which infertility exists. The purpose of outreach CMEs have addressed the basic training and SIGs like POR and fertility preservaton have concentrated on spreading learning at superspecialized levels. This edition deals with putting together these activities with learning points and comments from audience and faculty which participated. Our members have made the presence of IFS global by their presentations in international conferences like ESHRE and through their publications. We have dedicated a column for that and awards and felicitation to our members.

We sincerely thank all our authors for their wholehearted contribution towards the articles of this bulletin. We are open to all your comments and suggestions and would encourage all our readers to contribute in our forth coming issues of IFS conversations.

We look forward to meeting you all at Fertilvision 2018 at Kochi in December !

**Dr Surveen Ghumman**

**Dr Shweta Mittal Gupta**

## INDIAN FERTILITY SOCIETY INITIATIVES

## INVITED ARTICLES

### Facts about AMH as a tool to assess ovarian reserve



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**DR NYMPHEA WALECHA**

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Ovarian reserve, a concept reflecting oocyte quantity and quality at a given time point, has gained importance as assisted reproduction has become more widespread. It is a well known fact that reproductive capacity is closely but variably related to chronological age and is dictated by biological ovarian age or ovarian reserve. The number of primordial follicles decreases with age and is virtually depleted at menopause. AMH is a biomarker which reliably predicts reproductive capacity. There is a very good correlation between the serum AMH level and the number of follicles potentially capable of maturation and thus also the ovarian functional reserve.<sup>1</sup> The clinical implication of serum AMH has accelerated since the demonstration of less intra and inter cycle variability. In this article we discuss various clinical applications of AMH.

#### Nomogram using AMH for stimulation protocol

The most important clinical implication of serum AMH is its linear correlation with the oocyte yield in assisted reproduction. A meta-analysis revealed that the serum AMH level may be the best ovarian reserve marker for predicting a poor or hyper-response.<sup>2</sup> Nomograms integrating serum AMH have been developed and analyzed to optimize a stimulation protocol, including the set-up initial dose of follicle-stimulating hormone (FSH), so that the risk of cycle cancellation and/or ovarian hyperstimulation syndrome can be minimized. The Evidence-based Stimulation Trial with Human rFSH in Europe and Rest of World (ESTHER-1) was a randomized, assessor-blinded, noninferiority trial.<sup>3</sup> Ongoing pregnancy and live birth rates were similar in both groups, although the individualized protocol using follitropin delta resulted in fewer poor responders and fewer hyper-responders.

#### Prediction of pregnancy and live birth in assisted reproduction

Several studies have demonstrated conflicting results in the ability of AMH to predict pregnancy and live birth after assisted conception. Two meta-analyses similarly demonstrated that the diagnostic odds ratios of AMH for predicting clinical pregnancy were higher in women with diminished ovarian reserves than in an unspecified ovarian reserve group. Future interest is whether a certain level of serum AMH can be a cut-off index to rule out women with a low probability of pregnancy. A recent review article demonstrated that some publication data showed a significant pregnancy rate in women with a very low AMH.<sup>4</sup> Therefore, we cannot exclude women with an exceedingly low probability of pregnancy despite a very low serum AMH.

#### General Population

##### Predicting menopause

Serum AMH levels gradually decrease after peaking at around 25 years of age to below the detectable limit at around 5 years before menopause. Indeed, two studies with 9 and 11 year follow-up periods demonstrated that women with a lower AMH in a certain age group experienced earlier menopause.<sup>5</sup> A recent study reported that serum AMH is superior to antral follicle count (AFC) and FSH in improving the predictive ability of the onset of menopause in combination with age.<sup>6</sup> However, the population-based cohort study with over 3000 females participants concluded that the additional AMH value is unlikely to represent individualization of reproductive age.<sup>7</sup> In addition, serum AMH in the general population is reportedly associated with older age or younger age at menarche and current oral contraceptive use. Recently, van Helden and Weiskirchen advocated the AMH standard deviation score (SDS) calculated by single-year, age-specific median, mean and standard deviation of serum AMH. AMH SDS is an age-independent score that is used to estimate ovarian function.<sup>8</sup>

##### Probability of natural conception

AMH's prediction of natural conception would be very useful to minimize the loss of time before infertility treatment. A positive correlation between serum AMH and natural conception was found in the study recruiting women more than 30 years of age,<sup>9</sup> while negative data were reported by the study recruiting women less than 30 years of age.<sup>10</sup> A 1-year follow up of female pregnancy planners (18–46 years) with regular menstrual cycles revealed that AMH, AFC and FSH did not predict time to pregnancy.<sup>11</sup>

AMH-producing small antral follicles comprise some of the increased cystic follicles in PCOS-affected women. Therefore, serum AMH is upregulated in PCOS-affected women. A meta-analysis published in 2013 suggested a possible cut-off value of AMH of 4.7 ng/mL with 82.8% sensitivity and 79.4% specificity.<sup>12</sup> Quinn et al. successfully demonstrated that age-stratified thresholds of AMH (25–30, 30–35 and 35–40 years) improved the odds ratio of PCOS diagnosis.<sup>13</sup>

Upregulation of serum AMH might be correlated with PCOS severity and phenotype. In a recent publication, the ratios of AMH/AFC were significantly higher in phenotypes A and D than in phenotype C.<sup>14</sup> Considering the suppressive effects of AMH on follicle development, AMH and/or an AMH receptor might be involved in the pathogenesis and patho-physiology of PCOS.

#### Malignancies and Chemotherapy

Many studies have been published in which serum AMH was adopted to assess ovarian reserve after chemotherapy for malignancies. Serum AMH is becoming a helpful tool for counseling women undergoing chemotherapy who desire future fertility, including fertility preservation. The limitation is that women with undetectable serum AMH after chemotherapy may resume regular menstruation.<sup>15</sup> A supersensitive AMH assay kit may more clearly distinguish women who might recover their menstruation.

#### Future fertility in cancer survivors

Another limitation is the lack of detailed information about the correlation between decreased serum AMH levels and future fertility in cancer survivors. A 10-year follow up of childhood cancer survivors revealed that preserved ovarian function in the mid-20s is likely to persist during the following 10 years, with a good chance of childbearing. In the last two decades, a new strategy for fertility preservation for female cancer patients, such as oocyte and/or ovary cryopreservation, has become widespread.

In oocyte cryopreservation following in vitro maturation in cancer patients, serum AMH can be a predictive factor for the number of oocytes. The OPTION trial by the Anglo Celtic Group demonstrated that goserelin reduced the risk of primary ovarian insufficiency in women with chemotherapy for early breast cancer (22% in the goserelin group vs 38% in controls). However, this study did not show a significant difference in serum AMH between groups.<sup>16</sup>

#### Endometriosis

The decreased ovarian reserve of patients who underwent cystectomy for endometriomas has been evaluated using serum AMH. A considerable number of studies, including two systematic reviews, revealed the risk factors that affect postoperative serum AMH, such as bilateral surgery, severe endometriosis, larger cyst size and thermal damage.<sup>17</sup> Although, several publications confirmed the possible recovery of serum AMH level, it is unclear which groups are involved in serum AMH level recovery or decline.

Two meta-analyses evaluating hemostatic methods during endometrioma surgery similarly concluded that bipolar electrocoagulation negatively affected ovarian reserve and, therefore, should be avoided.<sup>18</sup> Regarding serum AMH recovery, Saito et al. reported that the pre-existing mesosalpinx disturbance caused by adnexal adhesion may be the reason why a certain group of women is unlikely to recover their serum AMH level after surgery for endometriomas.<sup>19</sup> Ablation using plasma energy did not negatively impact postoperative serum AMH levels or pregnancy rates after assisted reproduction. Similarly, the pregnancy rate after ablation of plasma energy was reportedly comparable regardless of preoperative serum AMH levels.<sup>20</sup>

#### Salpingectomy

Disturbed ovarian reserve might be an issue in fertility-preserving interventions. Salpingectomy is often performed to improve treatment success in assisted reproduction for women with hydrosalpinx. Two cross-sectional studies comparing women after salpingectomy and nonsalpingectomy controls reported conflicting results regarding the postsurgical decrease in serum AMH level.<sup>21</sup> A systematic review and meta-analysis of six longitudinal studies and two cross-sectional studies was published in 2017.<sup>22</sup> Either meta-analysis comparing pre and postoperative serum AMH or comparing the salpingectomy and control groups showed no significant differences in serum AMH level.

**Table 1 shows the utility and limitations of AMH in various clinical situations**

Situation	Utility	Limitations
Assisted Reproduction	Individualization of stimulation protocol integrating serum AMH is useful for avoiding poor and hyper responses but not useful for improving pregnancy rates.	Very low serum AMH cannot exclude women with an exceedingly low probability of pregnancy.
General Population	It can pick up poor ovarian reserve in women.	Limitation in individualization of reproductive age and prediction time to menopause using serum AMH due to the heterogeneous AMH decline trajectories.

PCOS	Serum AMH levels and AMH gene variants might be involved in the pathophysiology of PCOS.	Cut-off values should be dependent on age.
Chemotherapy	AMH assay kit may more clearly distinguish women in whom the menstrual cycle would possibly recover.	Ovarian protection using GnRHa does not improve serum AMH after chemotherapy. Predictive ability for future fertility using serum AMH remains inconclusive.
Gynecological interventions	Bipolar coagulation can deteriorate the ovarian reserve compared to other hemostasis methods in endometrioma surgery. Ablation of plasma energy might be an alternative procedure in terms of better preservation of serum AMH.	

### Conclusion

Increasing evidence suggests that AMH is the most useful and reliable marker of ovarian reserve in a wide range of clinical settings. Even after a decade of intensive research, the clinical implication of serum AMH has been updated during a couple of years. In addition, a recent accumulation of clinical research added not only new findings but also limitations of serum AMH as an ovarian reserve marker, such as heterogeneity in serum AMH trajectory and a weak prediction of live births in various clinical settings. However, the improved sensitivity of serum AMH assays and understanding the relevance of AMH to the pathophysiology of ovarian function will develop the new possibility of AMH as a marker of ovarian reserve and reproductive diseases.

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## New classification of poor responders



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Poor ovarian response (POR) to controlled ovarian stimulation (COS) for woman undergoing in vitro fertilization (IVF) usually indicates a reduction in the follicular response, resulting in reduced number of retrieved oocytes. A low ovarian response to stimulation occurs in about 10%–25% of patients undergoing COS for IVF and represents one of the most intractable problems in this group of patients. Till now more than 70 randomized controlled trials (RCTs) which have compared interventions in poor responders using a wide range of definitions, including the most recent Bologna criteria. However, analyzing the results of completed trials and the published literature, the overall conclusion is that there is insufficient evidence to support the routine use of any particular intervention for POR.

European Society of Human Reproduction and Embryology (ESHRE) attempted to standardize the definition of poor ovarian response to stimulation in a simple and reproducible manner which is known as 'The Bologna Consensus'. The group recommended that two of the following three features should be present for a diagnosis of POR:

- Advanced maternal age (>40 years) or other risk factors for POR.
- A previous POR (<3 oocytes with a conventional stimulation protocol).
- An abnormal ovarian reserve test i.e. antral follicle count (AFC) < 5–7 follicles or anti-mullerian hormone (AMH), 0.5–1.1 ng/ml (3.57–7.85 pmol/l).

Further to previous criteria, even two episodes of POR after maximal stimulation had been considered sufficient to define a patient as poor responders in the absence of advanced maternal age (AMA) or abnormal ovarian reserve test (ORT). However, if a young woman with normal ORT showed a poor response on conventional COS for IVF, she will not be categorized as poor responder by Bologna criteria.

### Why are previous classifications for defining poor responders considered inadequate?

- Dissatisfaction by majority of clinicians with existing classification.
- Most of the conclusions from all trials comparing interventions in poor responders are inconclusive with insufficient evidence especially, when Bologna criteria is used.
- With prevailing classifications there is insufficient evidence to support routine use of any one particular intervention discrimination patient subset within the POR population who would benefit from a particular intervention.

<p><b>POSEIDON GROUP 1</b> Young patients &lt;35 years with adequate ovarian reserve parameters (AFC≥5; AMH≥1.2 ng/ml) and with an unexpected poor or suboptimal ovarian response.</p> <p>Subgroup 1a: &lt;4 oocytes* Subgroup 1b: 4-9 oocytes retrieved*</p> <p>*after standard ovarian stimulation</p>	<p><b>POSEIDON GROUP 2</b> Older patients ≥35 years with adequate ovarian reserve parameters (AFC≥5; AMH≥1.2 ng/ml) and with an unexpected poor or suboptimal ovarian response.</p> <p>Subgroup 2a: &lt;4 oocytes* Subgroup 2b: 4-9 oocytes retrieved*</p> <p>*after standard ovarian stimulation</p>
<p><b>POSEIDON GROUP 3</b> Young patients (&lt;35 years) with poor ovarian reserve pre-stimulation parameters (AFC&lt;5; AMH&lt;1.2 ng/ml)</p>	<p><b>POSEIDON GROUP 4</b> Older patients (≥35 years) with poor ovarian reserve pre-stimulation parameters (AFC&lt;5; AMH&lt;1.2 ng/ml)</p>

**Table 1 :** Four groups of 'low prognosis patients' in assisted reproductive technology according to the POSEIDON's stratification based on oocyte quantity and quality.

RESOLVE, a non profit patient organization which is dedicated to educating patients of infertility classifies POR as women requiring large doses of gonadotropins with suboptimal oocyte number, indicating patients themselves have introduced suboptimal response to ovarian stimulation, which was not seen in previous definitions of POR.

To overcome this shortcoming of Bologna consensus for poor responders, recently the POSIEDON (Patient-Oriented Strategies Encompassing Individualized Oocyte Number) group recently proposed a new stratification to classify woman with poor response. According to this stratification, 4 subgroups have been suggested based on some quantitative and qualitative parameters,

1. Age and the expected aneuploidy rate
2. Ovarian biomarkers (i.e.AFC and AMH)
3. Ovarian response-provided a previous stimulation cycle was performed.

Poseidon stratification broadly classified all poor responders into 4 groups. First and second groups have normal ovarian reserve but showed poor response on conventional COS for IVF whereas the third and fourth group have low reserve and showed low response. However, group 1 and 3 are woman with age <35 years , group 2 and 4 are woman with age >35 years.Group 3 and 4 of Poseidon by Poseidon stratification have the ability to accurately assess low ovarian reserve and thereby predict poor ovarian response to conventional stimulation. ( Table 1) A large variety of strategies have been developed to improve outcome in these patients with diminished ovarian reserve. However, there is no established intervention or treatment protocol for this group of poor responder.

### Conclusion

Poor ovarian response to gonadotropin is a commonly encountered situation in IVF normally occurring in patients with expected poor ovarian reserve and sometimes even in patients with base line normal ovarian reserve, however showing sudden low response to ovarian stimulation culminating in poor oocyte recruitment and recovery.

Till 2016 the world was categorizing these patients as per the Bologna criteria to classify poor ovarian response (POR). There have been multiple papers defining poor ovarian response, still no consensus was reached to clearly define this population.as per Bologna criteria, the shortcoming was that, based on this classification, it was difficult to discriminate patients who would benefit from specific interventions. Besides, decrease in absolute number of oocytes, it is extremely important to have strategies for age related decrease in oocyte number as these women carry a higher risk of chromosomal abnormalities occurring during meiosis II. Thus POSEIDON marker for successful outcome which

effectively would mean ability to retrieve the number of oocyte recovery necessary to achieve at least one euploid embryo for transfer in each patient. This model will not only help clinicians in medical management but also in counsellingpatients for what to expect, helping in reducing time to pregnancy. POSEIDON group focuses specially on the diagnosis and management of low prognosis patients.

POSIEDON group emphasizes on the ability to retrieve the number of oocytes necessary to achieve at least one euploid embryo for transfer in each patient. This they believe represents a more pragmatic endpoint for clinicians providing care to infertility patients. Thus, it opens the possibility of developing prediction models to help clinicians in counseling and setting patient expectations and also helps in reducing time to pregnancy.

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## Adjuvants in stimulation of poor ovarian responders (POR)



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POR is one of the main challenges of modern reproductive medicine. It indicates a reduction in quantity and quality of oocytes in women of reproductive age group. Around 9 – 24% of infertile women are poor responders.

The definition of poor ovarian response (POR) and its management remains a controversial and complex clinical issue. A systematic review of 47 randomized controlled trials revealed 41 different definitions of POR. The number of oocytes retrieved was adopted as a criterion of POR in 40% of the trials, although the threshold number differed considerably among studies. Subsequently, in 2011, an ESHRE consensus group<sup>1</sup> took the effort to try to standardize the definition of POR, establishing the so called ESHRE Bologna criteria.

The ESHRE consensus Bologna criteria for poor ovarian response (POR):

- Advanced maternal age (≥40 years) or any other risk factor for POR
- A previous POR (≤3 oocytes with a conventional stimulation protocol).
- An abnormal ovarian reserve test (i.e. antral follicle count < 5–7 follicles or AMH < 0.7–1.3 ng/mL)

Two out of three criteria need to be fulfilled in order to be defined as POR.

Although the Bologna criteria was a crucial step towards defining POR, it became clear that even when using the Bologna criteria, the POR population remained heterogeneous primarily because the criteria did not adequately take into consideration the age-related impact on oocyte quality, which obviously impacts success rates. Moreover, confusion existed between real poor ovarian response (poor ovarian reserve) and the cause of the poor response. Finally, in the Bologna criteria, no recommendations for clinical decision-making were given.

In 2016 a group of reproductive endocrinologists and scientists gathered to further refine the definition of POR<sup>2</sup>. ( Fig 1) As a result, the new POSEIDON (Patient-Oriented Strategies Encompassing Individualized Oocyte Number) classification was developed, providing a more detailed classification to reduce the heterogeneity of the Bologna criteria. In brief, according to the POSEIDON classification patients are sub-divided into four subgroups based on quantitative and qualitative parameters, namely:

- (i) Age
- (ii) Antral follicle count and/or AMH
- (iii) Ovarian response – if a previous stimulation was performed

It is thought that the expected POR patient (POSEIDON groups 3 and 4), particularly the ageing group (POSEIDON group 4) would achieve a lower live birth rate than younger counterparts with normal/high ovarian reserve. There is still no consensus on management of this category of patients. The Cochrane review of poor responder interventions concluded that no particular treatment offered clear benefit, or could be recommended<sup>3</sup>. Few authors recommend increasing the dose of gonadotropins if hyporesponse is expected while others believe that increasing a dose beyond certain threshold does not improve pregnancy rates. Other strategies include microdose flare protocol, luteal phase stimulation, dual stimulation and addition of certain adjuvants to a standard protocol. Several adjuvants have been proposed to determine factors affecting follicular output ratios and increased ovarian response but no strategy has been recommended so far. Here, we will discuss in details certain adjuvants used for the treatment of POR patients.

### Androgens

Androgens play a key role in steroidogenesis, acting as a substrate in the conversion of androgens into estrogens through aromatization. Previous studies in nonhumans described greater numbers of primary and preantral follicles and increased androgen receptor expression. Increased ovarian levels of FSH receptors have also been associated to testosterone administration in animal models. Hence, it is speculated that androgens may act on ovarian follicular development by increasing the number of FSH receptors expressed in the granulosa cells, and the increasing intrafollicular androgens could augment granulosa cell anti-Müllerian hormone (AMH) production, thus stimulating early stages of follicular growth. Cochrane review in 2015 concluded that in women identified as poor responders undergoing ART, pre-treatment with DHEA or testosterone may be associated with improved live birth rates, though the overall quality of the evidence is moderate. They also emphasized that there is insufficient evidence to draw any conclusions about the safety of either androgen. Definitive conclusions regarding the clinical role of either androgen awaits evidence from further well-designed studies<sup>4</sup>.

### Transdermal Testosterone

A systematic review of 3 RCTs revealed that pretreatment with testosterone in poor ovarian responders undergoing IVF/ICSI significantly increased their oocyte number (MD=1.36, 95% CI 0.82-1.90) and achieved a two-fold improvement in live birth rate per initiated cycle (RR=2.01, 95% CI 1.03-3.91) and clinical pregnancy rate per cycle (RR=2.09, 95% CI 1.14-3.81) compared with the control group. At the same time, a lower dose of FSH (MD= 459.46, 95% CI -610.47 to -308.46) and a shorter duration of FSH (MD=-0.80, 95% CI -1.22 to -0.37) used were found in the transdermal testosterone group compared with the control group. However, the main limitations were heterogeneity in the dose (1% gel, 12.5 mg/day or patch) and duration (5-21 days preceding stimulation) of the transdermal testosterone used, the ovarian stimulation protocol, and the small sample size<sup>5</sup>. Thus, the results of the current reviews need to be interpreted with caution. Further good quality RCTs are required to provide more robust evidence and ensure more reliable conclusions in the future.

### Dehydroepiandrosterone (DHEA)

DHEA is a mild androgen, produced as an intermediate step by the adrenal glands (85%) and ovaries (15%) during steroidogenesis. The circulating levels of DHEA decline markedly with advancing age. In the ovarian follicle, DHEA is converted to androstenedione and estrone, the source of testosterone and estradiol according to the two-cell theory. The hypothesis of using DHEA in POR patients is that it is speculated it could restore ovarian follicular steroidogenesis in elderly patients. Besides, oral DHEA administration has been demonstrated to increase serum IGF-I concentrations, which are known to have a positive effect on follicular development and oocyte quality. Further, DHEA may enhance the follicular microenvironment through reducing apoptosis of the originally recruited follicles and beneficially affecting mitochondrial function in both follicular cells and oocytes.

Xu et al. in 2014 studied the effect of Dehydroepiandrosterone administration in patients with poor ovarian response according to the Bologna Criteria. Three hundred and eighty six poor ovarian responders that fulfilled the Bologna criteria underwent IVF-ET treatment with the GnRH antagonist protocol. The study group contained 189 patients, who received 75 mg of DHEA daily (25 mg three times daily) before the IVF cycle. The control group was composed of 197 patients who received infertility treatment, but did not receive DHEA. The DHEA group demonstrated significantly higher implantation rates (18.7% vs. 10.1%; P<0.01) and ongoing PRs (26.7% vs. 15.8%; P<0.05) as compared with the control. Therefore the authors concluded that DHEA pre-treatment does not significantly increase oocyte yield. However, the ongoing PRs in this subgroup of women were significantly higher after DHEA administration, suggesting that DHEA may increase IVF results by improving oocyte and embryo quality. This is the first study to assess the effect of DHEA administration in poor ovarian responders as described by the Bologna criteria. The main limitation of the study is its retrospective design, though consecutive patients that fulfilled the Bologna criteria were included and treated with exactly the same protocol, minimizing the likelihood of selection bias<sup>6</sup>.

A meta-analysis of dehydroepiandrosterone supplementation among women with diminished ovarian reserve undergoing in vitro fertilization or intracytoplasmic sperm injection including 8 studies published in International Journal of Gynecology and Obstetrics in 2015 concluded that supplementation with DHEA has a positive effect in women undergoing IVF/ICSI treatment for DOR, however, the effects of DHEA on oocyte retrieval, implantation, and abortion were not significant<sup>7</sup>. In contrast to this, a single centre, double blinded, placebo controlled, randomized trial published in European journal in 2017 concluded that pre-treatment DHEA supplementation (75mg/day for at-least 12 weeks before starting ovarian stimulation) did not improve the response to controlled ovarian hyperstimulation or oocyte quality or live birth rates during IVF treatment with long protocol in women predicted to have poor OR<sup>8</sup>. Additional larger, multicenter, randomized trials are needed to refute or reinforce these findings.

### ANDRO IVF Protocol

This study aimed to improve poor ovarian response through intra-ovarian androgenization. First, androgen serum levels are increased with the administration of transdermal testosterone gel every other day; then, intrafollicular androgen levels are increased with the administration of hCG twice a week; and finally, androgen aromatization to estrogen is prevented with the daily administration of an aromatase inhibitor, letrozole. Letrozole increases the intra-ovarian concentration of androgens by inhibiting aromatase activity.

ANDRO-IVF protocol includes two treatment phases, as described below:

- Phase 1: ovarian preparation (previous cycle).
- Phase 2: ovarian stimulation (IVF cycle).

The phase of ovarian preparation included intra-ovarian androgenization and cycle control. Androgenization was performed with the application of transdermal testosterone gel 25 mg every other day, starting on the first day of the menstrual cycle. Letrozole 2.5 mg was administered orally on a daily basis, and patients were given hCG 2500 IU subcutaneously twice a week. Cycle control was performed with the administration of estradiol valerate 8 mg daily from Day 3 to Day 14 of the menstrual cycle, followed by estradiol valerate 4 mg daily up to Day 24. Micronized progesterone 400mg was given from Day 15 to Day 24 and suspended to promote a new menstrual cycle, in which stimulation occurred. This protocol apparently improved clinical outcomes of poor responders in parameters such as number of oocytes retrieved and clinical pregnancy rates. Further randomized controlled trials are needed to confirm these findings<sup>9</sup>.

### Growth Hormone (GH)

GH plays an essential role in the function of ovary, as it can stimulate the growth and function of granulosa cells by increasing intraovarian production of insulin-like growth factor-1. Research on animal and human have shown that GH is important for ovarian steroidogenesis and follicular development. Co-treatment with GH improves the Gonadotropin effects on granulosa cells. Cochrane review on use of GH in ART cycles concluded that although the use of growth hormone in poor responders has been found to show a significant improvement in live birth rates, it is difficult to identify which sub-group of poor responders would benefit the most from adjuvant growth hormone. Therefore, before recommending growth hormone adjuvant in in-vitro fertilisation further research is necessary to fully define its role<sup>10</sup>.

A systematic metaanalysis by Kolibianakis et al. published in Human Reproduction update 2009 which included 6 RCT examined addition of GH to gonadotropin in ovarian stimulation of POR and found that GH addition significantly increased the clinical pregnancy rate and live birth rate<sup>11</sup>. However, a meta analysis by Yu et al reported that no significant difference was found for clinical pregnancy rate between the GH and control groups<sup>12</sup>. A study which compared 4 stimulation protocols in POR with GH addition showed that number of retrieved and fertilized oocytes were highest in the long/GH protocol when compared in the rest of the protocols, while considering the clinical pregnancy rate, there was a difference for the long/GH protocol but the difference did not reach statistical significance.

Various studies used different doses of growth hormone (4 IU daily to 24 IU alternate day), starting from the day of gonadotropin stimulation or from day 21 in long protocol and continued till the day of trigger. We did a prospective study at our centre assessing the effectiveness of addition of growth hormone to the antagonist protocol in POR patients between June 2017 to March 2018. Patients were stimulated with 375 IU of human menopausal gonadotropins and Growth hormone 4 IU was added to one group from day 2 of menstruation till the day of trigger. We found out that addition of growth hormone had significant positive effect on predictors of oocyte quality and quantity i.e. serum estradiol and embryos formed. The number of oocytes retrieved and clinical pregnancy rates were also increased in growth hormone group though it did not reach statistical significance.

### Recombinant LH

Supplementing recombinant human FSH (r-hFSH) with recombinant human LH (r-hLH) during ART may have beneficial effects on outcomes in women with POR. The beneficial effects are owing to increased FSH receptor expression and growth, in addition to improved follicular recruitment and a reduced rate of granulosa cell apoptosis.

ESPART (Efficacy and Safety of Pergoveris in Assisted Reproductive Technology) trial was designed to

investigate the hypothesis that a fixed-ratio (2:1) combination of r-hFSH/r-hLH was generally safe and superior to r-hFSH alone, in terms of the number of oocytes retrieved, for COS in patients with POR. In the population of women with POR investigated in this study, although the number of oocytes retrieved was similar following stimulation with either a fixed-ratio combination of r-hFSH/r-hLH or r-hFSH monotherapy, post hoc analyses showed that there was a lower rate of total pregnancy outcome failure in patients receiving r-hFSH/r-hLH, in addition to a higher live birth rate in patients with moderate and severe POR<sup>13</sup>. The authors concluded that these findings are clinically relevant and require additional investigation.

A systematic meta analysis published in Fertility Sterility in 2018 assessed the role of recombinant human LH (r-hLH) supplementation in ovarian stimulation for ART in specific subgroups of Patients<sup>14</sup>. The authors concluded that the use of r-hLH supplementation in women with suppressed endogenous LH levels (poor responders) remains controversial. Recombinant LH supplementation appears to be beneficial in two subgroups of patients:

1. Women with adequate prestimulation ovarian reserve parameters and an unexpected hyporesponse to r-hFSH monotherapy.
2. Women 36-39 years of age

### Luteal Phase Manipulation

#### Luteal estradiol priming (LE)

LE priming (estradiol valerate 4 mg from day 21 to day 2) may improve synchronization of the pool of follicles available to COH, thus resulting in more favorable response to COH. A systematic review by Reynolds et al. in 2013 found out that women exposed to LE priming (n = 468) had a lower risk of cycle cancellation [relative risk (RR): 0.60, 95% confidence interval (CI): 0.45–0.78] and an improved chance of clinical pregnancy (RR: 1.33, 95% CI: 1.02–1.72), though there was no significant improvement in the number of mature oocytes obtained or number of zygotes obtained per cycle. Despite its limitations, the authors support the use of LE priming prior to COH in poor responders until the results of an adequately powered, well-designed, multi-centre RCT are available on the effect of LE priming in ART<sup>15</sup>.

#### GnRH antagonist administration

A study published in Reproductive Biology Journal in 2017 supports luteal GnRH antagonist pretreatment in poor ovarian reserve IVF patients as it improves ovarian stimulation parameters and reproductive outcomes. The authors found out that antagonist group had significantly more metaphase-2 (MII) oocytes (p=0.009), a higher oocyte maturity rate (MII/total oocytes) (p=0.029), and a higher mature oocyte yield (MII/AFC) (p=0.020) with more cleaved embryos (p=0.036), and a significantly reduced number of canceled cycles (26.7% vs. 44.7%; p=0.048). The clinical pregnancy rate per cycle was also higher in antagonist group (22.2% vs. 13.2% (p=0.195)), though not statistically significant<sup>16</sup>.

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## Decision making in Stimulation of Poor Responder



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In this era of ART individualization has become an essential component of ART. Individualization is needed in deciding method of sperm preparation, in sperm retrieval techniques, in ovarian stimulation protocols. It is specially needed in dealing with hypo and hyper responders. Cumulative live birth rates upto 71% have been reported from some centres as the result of individualized regimes.<sup>1</sup>

Individualization involves a balance between efficacy and safety. The management of poor ovarian reserve remains a challenge, which starts from the definition. It has been difficult to put randomized controlled trials together because of the varied definitions used to recruit patients in various studies. A step forward was the Bologna criterion and a further step now is the Poseidon classification.

### A Quality Marker of the iCOS Strategy - FORT

Recent studies have shown that a single extra oocyte may increase the chances of pregnancy considerably. An analysis done by Sunkara et al showed that the number of eggs in IVF is a robust surrogate outcome for clinical success. The results showed a non-linear relationship between the number of eggs and LBR following IVF treatment. The number of eggs to maximize the LBR was identified as 15.<sup>2</sup>

Hence it becomes important to analyse the follicular output rate (FORT) which is assessed by a ratio of number of antral follicles and number which responded i.e. number of preovulatory follicles.<sup>3</sup> It takes into consideration also number of oocytes actually retrieved in relation to antral follicles and preovulatory follicles. (figure 1) A woman may have only 5 AFC but have 4 preovulatory follicles. She has a good FORT. Whereas a woman who has 25 AFC and produces only 8 preovulatory follicles with optimum dose will have a poor FORT and will be termed a hyporesponder. The most common iatrogenic cause of poor response is a low FSH dose or no supplementation of LH in severely suppressed LH or LH polymorphism. However live birth rate is related not just quantity but also to quality of embryo. Hence live birth rates decrease with age as aneuploidy rates increase with older women.<sup>3</sup>

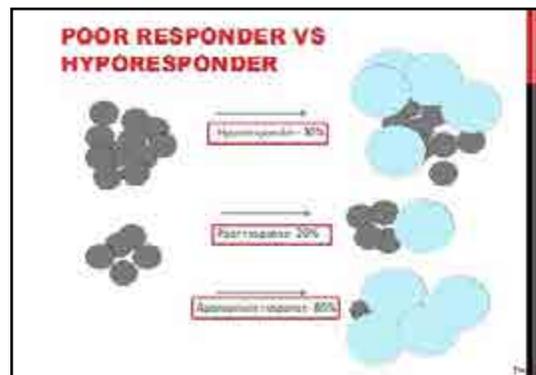


Fig 1. Poor Ovarian Response and Hyporesponder

**ART calculator**

It is important to be able to assess the aneuploidy oocyte yield to prognosticate. A single euploidy blastocyst has a chance of 60% to implant irrespective of age of woman.<sup>4</sup> 'Ability to retrieve the number of oocytes needed to obtain at least one euploid embryo for transfer' was proposed by the POSEIDON group as a new measure of success in ART<sup>5,6</sup> Hence many variables which lead to development of one euploid embryo must be considered like - expected aneuploidy rate, fertilization rate blastocyst formation rate and finally total number of oocytes. The fertilization rate, and blastocyst rate are also dependent on the sperm. It has been calculated that for a young women one requires 4-7 oocytes and for an older one around 12.<sup>7</sup> The ART calculator takes into account age and other parameters to predict oocyte yield needed for development of one aneuploidy blastocyst.

**Individualized COS in a Poor Responder GnRH Analogue Aagonist or Antagonist?**

Antagonists have the advantage that lower dose of gonadotropins is required and extreme suppression seen with antagonist is not there. Hence, antagonist have been preferred for a poor responder.

However, it has been seen that asynchronous follicular growth due to premature FSH rise is a common cause of cycle cancellation and poor oocyte retrieval in expected poor responders.<sup>3</sup> Studies have shown that results are marginally better with an GnRH agonist protocol as there is more synchronized growth.<sup>8</sup> Reported an average increase in recovery of mature oocyte by one in poor responders. Cancellation rate was also less. Increase of a single oocyte increases the pregnancy rate by 5%.<sup>9</sup> Hence GnRH agonist protocol should be considered in an expected poor responders, specially those where early follicular development is seen with premature rise of FSH in luteal phase. However, it must be kept in mind that there are studies which have shown that agonist protocol may cause deep suppression in poor responders, use of higher dose of gonadotropins and higher cycle cancellation rate.<sup>10</sup>

**Gonadotropin - Natural cycle vs higher dose gonadotropins**

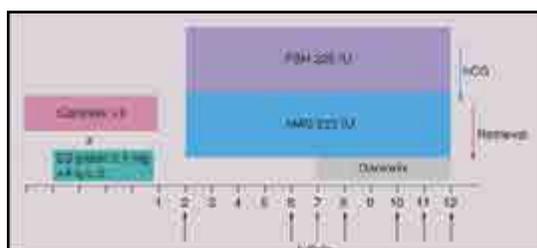
There are many regimes for natural cycle or mild/minimal stimulation. These regimes came into practise after it was demonstrated by some studies that higher doses of gonadotropins yield aneuploid embryos. However, subsequently some studies have not supported this hypothesis.

1. **Mimimal stimulation:** Start with 100 mg clomiphene followed by FSH on day 2,4,6 and then daily. Antagonist started as indicated.
2. **Augmented Natural cycle:** Add 150 IU of FSH to natural cycle.

It has been seen that results do not improve with increasing dose beyond 300 IU of FSH. Natural cycle was considered an option however if results are compared a pregnancy rate of not more than 2.6. is seen whereas a stimulation with 300 IU showed a pregnancy rate of 11 % with one cycle in POR women.<sup>11</sup> Hence, it is recommended that stimulation should be done but with not more than 300 IU.

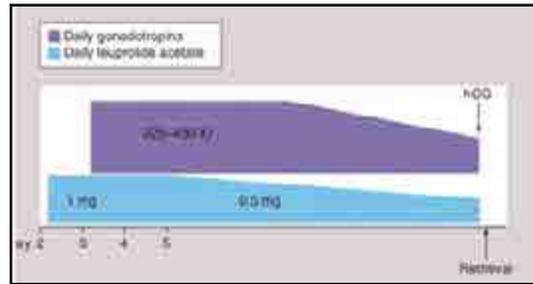
**Use of Luteal Phase Estradiol and GnRH Antagonist**

Estradiol or GnRH antagonist is started 5 days prior to period to suppress premature rise of FSH which occurs in poor ovarian reserve women leading to early recruitment of dominant follicle. This is followed by stimulation with FSH/HMG



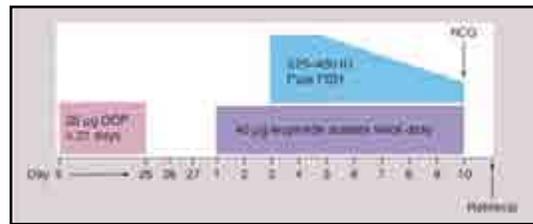
**Standard Flare Protocol**

Lupride is started on day 2 and advantage is taken of flare effect which occurs in first 4 days leading to endogenous surge of FSH. Alongside Exogenous FSH is given for stimulation. Lupride is continued in lower dose to prevent premature LH rise.



**Oral Contraceptive Pill/MicrodoseLeuprolide Protocol**

Microdosed lupride is given from day 1 to avail the flare advantage of intrinsic FSH release. It is then continued to prevent premature LH surge. The cancellation rates are high in this protocol.



**Corifolliculotropin in Poor ovarian reserve**

Corifolliculotropin, a long acting FSH is useful in poor responders for providing high and consistent levels of FSH. A single s.c.dose of 150 µg corifollitropinalfa on the first day of ovarian stimulation, followed if necessary, from Day 8 onwards, with 450 IU of follitropin beta/day, gives similar results to daily doses of 450 IU follitropin beta.<sup>12</sup>

**Duostim or double stimulation in same cycle**

Duostim protocol consists of stimulating the woman twice in the same cycle to increase the oocyte yield. It is based on the concept that there are waves of folliculogenesis which can occur throughout the cycle, not limited to day 2. Hence first stimulation occurs in follicular phase and second one in the luteal phase. Embryos are frozen, pooled and transferred in next cycle. There was no difference in fertilization rate and blastocyst rate, confirming the safety in maintaining oocyte quality of both stimulations.<sup>13</sup> The greatest benefit of this protocol is the accumulation of oocytes in a single cycle of stimulation, minimizing the time in which it will be performed.

**Ovulation Trigger in Poor Responder**

HCG trigger for ovulation should be given with a slightly smaller lead follicle of 16 mm in poor responders. Earlier ovulation trigger may improve number and quality of embryos

**Conversion to IUIvs Proceeding to IVF in Poor Responder**

It has been seen that if there is only one follicle chances of pregnancy are similar with IVF and IUI. But as number of follicles increase IVF shows a higher success rate. A multicentric trial by Quinquish showed that when there are three follicles many proceed to IVF but decision is difficult if 2 or less follicles are present. They also found that if age is less than 40 it is 13.1 % in IVF and 2 % in IUI (p=0.035).<sup>14</sup>

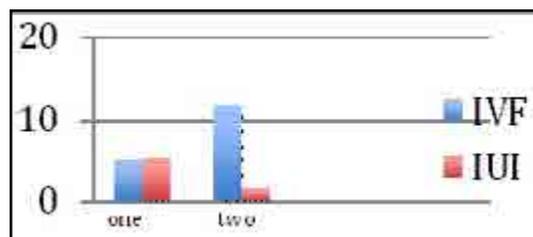


Fig 1: Poor responder results with IUI and IVF<sup>15</sup>

Reichman et al performed a study in 2013 A total of 1,098 patients were identified whose IVF cycles were characterized by recruitment of three or fewer follicles. Cycles with three follicles were defined as those with three follicles ≥ 14 mm with no fourth follicle ≥ 10 mm Outcomes were compared for patients proceeding with OR (n = 624) versus converting to IUI (n = 474). Patients with three or fewer follicles were 2.6 times more likely to achieve a live birth with IVF versus IUI (9.3% vs. 3.4%).<sup>15</sup> (Fig 1).

They concluded that *no benefit was gained by performing OR in the setting of one follicle. IVF compared with IUI presents superior pregnancy rates in the setting of two or more follicles.*

**Cancellation of Cycle vs Proceeding to IVF in Poor Responder**

In a study which compared results of poor responders between proceeding with cycle ( group I), converting to IUI ( Group II)or abandoning cycle and starting again (Group III). All pregnancy outcomes were significantly higher in group 1 than for those converted to IUI (group 2), and all pregnancy outcomes were higher with borderline significance in group 3 vs. group 2. (Figure 2) . Hence it was concluded that proceeding to IVF may be a better option than abandoning and trying again.<sup>16</sup>

Fig. 2: Comparison of Pregnancy rates of IVF, converting to IUI or abandoning cycle and trying

	Proceed to IVF	IUI conversion	Abandon and try again
Biochemical pregnancy	13%	4.9%	9.7%
Ongoing pregnancy	6.8%	2%	5.5%

**Which adjuvant to be used and in whom? Individualizing Adjuvant Use**

**Luteinizing Hormone (LH):** LH is an adjuvant which acts better in women in Poseidon group 1 and 2 where there is an unexpected poor response as ovarian reserve is low. This may be due to LH gene polymorphism. Another subgroup where it has a role is in older women where the sensitivity of ovaries to LH has been seen to decrease because of reduced number of functional LH receptors and decreased androgen production by 50% which starts at age 30. Hence they require higher levels of LH for effect.

**Growth Hormone:** Growth hormone (GH) enhances oocyte quality by accelerating and coordinating cytoplasmic and nuclear maturation, as seen in bovine oocytes. Cochrane review 2010 stated that GH increased pregnancy and live birth in a statistically significant manner.<sup>17</sup>

**DHEAS and Testosterone:** DHEAS and testosterone have been shown to increase oocyte yield, pregnancy rates and live birth rates. Action is more in those with unexpected poor response i.e. Poseidon 1 & 2. It has been seen to act better in younger women but impact is seen only after 6 weeks and reaches a maximum after 6 months of administration.<sup>18</sup> (Cochrane 2015)

It is known to decrease aneuploidy rates in an older woman and hence improve pregnancy and live birth rates

**New Strategies for poor responders ACCU-VIT and embryo pooling**

Patients are offered minimal stimulation cycles with vitrification and embryo banking. ACCU-VIT using minimal stimulation and reliable vitrification methods is a successful approach to treat poor responders creating a situation similar to normal responders. This approach

allows the poor responder women to have consecutive cycles of embryo accumulation before the follicular reserve is depleted. The cumulative pregnancy rate was statistically higher in the ACCU – VIT group (41.5%) than the conventional IVF group (22.3%).<sup>20</sup> Embryo pooling is now a well established procedure being done where response is poor and there are less embryos.

### Autologous Stem Cell Ovarian Transplant (ASCOT)

Stem cell transplant in ovaries with the idea of regenerating the follicle pool in poor ovarian reserve women is still experimental. The ASCOT improved follicle and oocyte quantity enabling pregnancy in women who are poor responders previously limited to oocyte donation.<sup>21</sup>

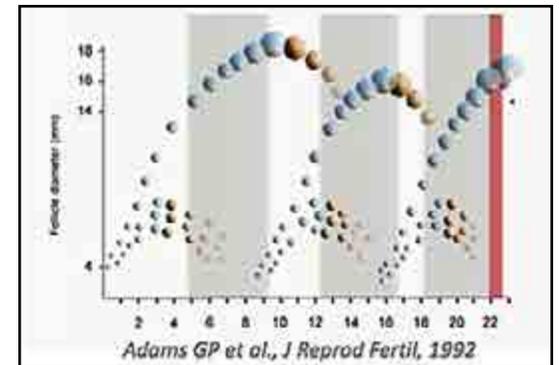
There are many options with poor responders. Poseidon classification has redefined poor responders and categorized them into groups where certain stimulation protocol and adjuvant may be effective. It is important to identify which group a patient belongs to and individualize treatment accordingly. Novel stem cell treatment gives new angle to ovarian regeneration in women where earlier donor egg was the only option. However it still need further studies before it can be established as a treatment modality.

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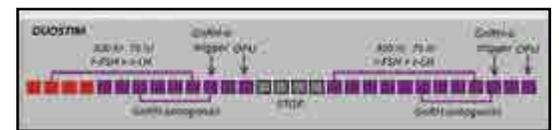
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follicular growth waves and follicles can be recruited as compared to the earlier concept of single stimulation in one particular menstrual cycle. This can help in shortening time to pregnancy, embryo pooling and higher chance of finding a euploid embryo if subjected to PGS, thereby increasing implantation rate per embryo transfer.

**Table :** showing presence of three follicular recruitments in same menstrual cycle



**Table: Duo stim regimen**



How is duo stim undertaken (important points):

- Start gonadotropin from day2/3 of menstrual cycle. The first ovarian stimulation cycle is like any other cycle with rFSH and rLH combination with a flexible dose antagonist protocol.
- The first trigger is always a GnRH agonist trigger so as to bring early luteolysis and a more suitable internal hormonal milieu to start 2nd ovarian stimulation.
- Second COS is started after 5 days of first COS, so that there is adequate fall in estrogen levels and this would shorten the duration of COS in the luteal phase stimulation, reducing duration of gonadotropins.
- Patients will normally experience menstruation during 2nd phase of COS, which shouldn't make us stop the cycle. COS should continue.
- The 2nd trigger can be either hCG or GnRH agonist.
- All embryos pooled can be subjected to PGS or an non PGS embryo transfer.
- All embryo transfers are always frozen cryopreserved embryo transfers.

## Dual Stimulation for Poor Responders in IVF : A Case Report



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Mrs.P, 39 year old lady, married since 12 years, a case of secondary infertility of 4 years with previous one spontaneous conception 10 years back. Previous history of 3 failed IVF for unexplained infertility (1 oocyte in first IVF cycle, 2 oocytes in 2<sup>nd</sup> IVF cycle, 2 oocytes in 3<sup>rd</sup> IVF cycle). All the previous stimulations were done in three different follicular phases. Her AMH was 1 ng/ml with AFC of 5 (both ovaries). To start 4<sup>th</sup> IVF duo stimulation protocol was discussed. First part of ovarian stimulation was started in follicular phase from day 2 of menstrual cycle with rFSH 225 iu with 75 iu of rLH. After ten days of stimulation 4 dominant follicles were observed with terminal E2 of 825 pg/ml. GnRH agonist trigger was administered. 5 oocytes retrieved with 2 day 5 embryos frozen. On 5<sup>th</sup> day post OCR (luteal phase) ovarian stimulation was restarted with rFSH 225 iu and 75 iu of rLH. After 11 days of ovarian stimulation 4, dominant follicles observed,<sup>3</sup> oocytes retrieved, 1 day 5 embryos frozen. Embryo clubbing done and subjected to preimplantation genetic screening (PGS) with one euploid embryo which was transferred in a frozen cryo embryo transfer cycle. Beta hCG was positive and resulted in an ongoing single live intrauterine pregnancy.

**What is dual stimulation :** Dual stimulation effectively utilizes two phases of follicular recruitment in the same menstrual cycle as it has been proposed that in the same menstrual cycle women can have 2-3 phases where

## Poor Ovarian Response in PCOS



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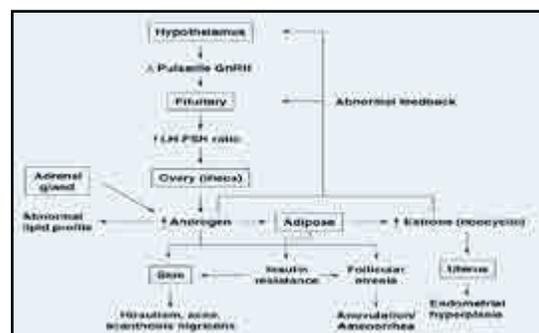
Polycystic ovary syndrome (PCOS) is a heterogeneous disorder consisting of clinical or biochemical hyperandrogenism with ovulatory dysfunction ruling out secondary causes for the same. Its diagnostic criteria has been modified along timescale and its prevalence varies broadly from 6 to 15% in general population depending on ethnicity studied and the criteria utilized. It is probably the most common endocrine disorder in reproductive age women.(1)

The reproductive issues with PCOS start with anovulatory cycles leading to subfertility. Post conception, PCOS women are at increased risk for early pregnancy loss (EPL).

After having successfully passed the first trimester, they commonly encounter later pregnancy complications like : Gestational diabetes mellitus (GDM), Pregnancy-induced hypertension (PIH), Preeclampsia, Preterm delivery, and Birth of small for gestational age (SGA) infant. Effective tackling of metabolic and reproductive issues relating to pregnancy forms the cornerstone of management of PCOS (1)

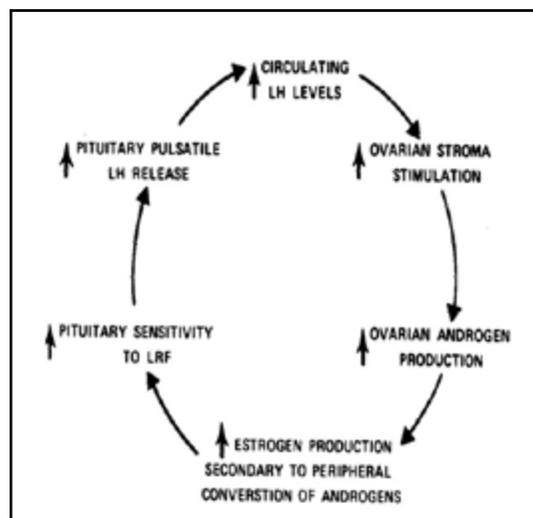
As per the Diagnostic criteria based on the modified consensus of National Institutes of Health and Child Health and Human Development, there are major criteria ie chronic anovulation, hyperandrogenemia, clinical signs of hyperandrogenism along with excluding other etiologies. Minor criteria are Insulin resistance, perimenarchal onset of hirsutism and obesity, Elevated LH : FSH ratio and Intermittent anovulation associated with hyperandrogenemia (free testosterone, DHEAS). Rotterdam criteria applies when 2 out of 3 of the following features are present ie Polycystic ovaries (>12 peripheral follicles or increased ovarian volume >10cm<sup>3</sup>), Oligo- or anovulation and Clinical and/or biochemical signs of hyperandrogenism. Exclusion of other etiologies such as : hypothyroidism, hyperprolactinemia, congenital adrenal hyperplasia, Cushing's syndrome, androgen secreting tumor setc are important (2).

### Pathophysiology

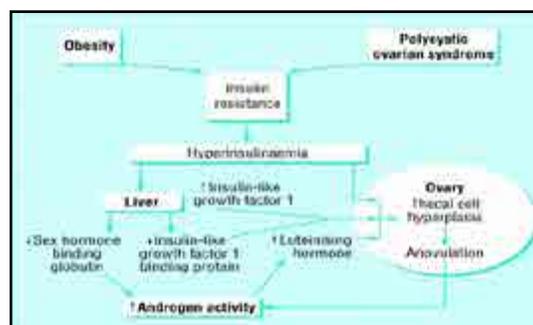


**Fig 1: Pituitary Adrenal interaction**

Abnormal Pituitary Function leads to Altered Negative Feedback Loop resulting in Increased GnRH from hypothalamus causing Excessive LH secretion relative to FSH by pituitary gland. LH stimulates ovarian thecal cells-- androgen production. There will be ineffective suppression of the LH pulse frequency by estradiol and progesterone. Androgen excess increases LH by blocking the hypothalamic inhibitory feedback of progesterone. (Fig 1&2)



**Fig 2: Possible Mechanisms for Chronic Anovulation in PCOS**



**Fig 3: Obesity and PCOS**

There is a strong correlation between Obesity and PCOS as evidenced by figure 3

Clinical manifestations of PCOS can range from menstrual irregularities and cosmetic concerns in adolescent age group, infertility and recurrent pregnancy loss in reproductive women and even it can present with metabolic syndrome and endometrial hyperplasia or carcinoma in menopausal women.

Infertility in PCOS can be related to defective oocyte development and quality, abnormal fertilization and endometrial receptivity, poor implantation and hyperinsulinemia. There can be abnormal fetal growth resulting in early pregnancy loss as well. Rotterdam and AE-PCOS society have identified three typical phenotype varieties of PCOS. These are Frank PCOS (oligomenorrhea, hyperandrogenism, and PCO), Ovulatory PCOS (hyperandrogenism, PCO, and regular menstrual cycles), and Non-PCO PCOS (oligomenorrhea, hyperandrogenism, and normal ovaries). The Rotterdam criteria also recognize a fourth phenotype, Mild or Normo-androgenic PCOS, which is defined by oligomenorrhea, PCO, and normal androgens.

The metabolic differences Between PCOS and normal patients also play a role in the outcome following treatment. PCOS, as one of the diseases that is associated with metabolic syndrome. It may also have changes in inflammation factors such as C3, CRP, Interleukin-6, TNF- $\alpha$ , and Lipid profiles. There is also a hypothesis that the PCOS state, as a low-grade chronic inflammatory state may stimulate the immune response, increasing inflammatory factors such as CRP.

## Problems during Controlled ovarian Hyperstimulation (COH)

The problems during COH in PCOS patients vary from hyper response to poor response. To variable degrees of ovarian hyperstimulation syndrome (OHSS) threatens every woman treated with assisted reproduction. Risk factors for OHSS include ovarian hyper-responsiveness and the presence of PCOS.

### Causes of failure of COH protocols in PCOS patients

#### Obesity

Obesity is associated with PCOS and adversely affects reproduction. In studies, approximately 60% to 70% of women with PCOS were found to be obese. Evidence of adverse effects includes increased rates of anovulation, fertility treatment failure, pregnancy loss, and late-pregnancy complications in overweight women. Obesity exacerbates the cardiometabolic consequences of PCOS and may result in fertility challenges. Excess weight contributes to increased time to conception, ovulatory dysfunction, lower implantation and pregnancy rates, higher miscarriage rates, and increased maternal and fetal complications. Compensatory hyperinsulinaemia resulting from insulin resistance causes hyper androgenism which inhibits follicular development.

Helping overweight women with PCOS achieve weight loss is essential to their long-term health, especially when they are experiencing infertility. Weight loss of as little as 5% to 10% of total body weight has been demonstrated to restore ovulatory and menstrual function.

Daily physical activity and dietary changes together with weight loss can help restore ovulation and enhance fertility for overweight and lean women with PCOS by increasing insulin sensitivity and thus lowering androgens (3).

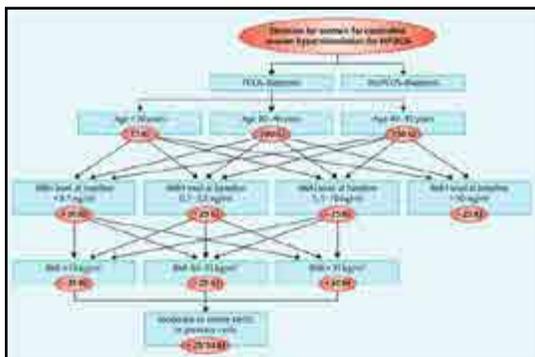
#### Endometrial Dysfunction

Endometrium in PCOS during the window of implantation is also found to be defective leading to poor implantation. In women with PCOS who are oligo- or anovulatory, the regulatory role of progesterone is suboptimal or absent, and this results in constant non-opposition of estrogen action on the endometrium. In the absence of ovulation and the effects of progesterone regulation, the endometrium does not undergo a secretory transformation and is constantly exposed to the stimulating and mitogenic effects of estradiol, which may lead to endometrium overgrowth, unpredictable bleeding patterns, hyperplasia and cancer. The endometrium of women with PCOS is considered a model of dysfunctional endometrium, demonstrating overexpression of androgen receptors and failing to regulate estrogen receptors (ERs), when compared to normal women. Studies carried out in PCOS have shown differences in complements of steroid receptors and coactivators, when compared to fertile women (4). The endometrium, in this case, overexpresses androgen receptors and fails to regulate the ER- $\alpha$  (estrogen receptor,  $\alpha$ ) in the window of implantation. Studies show that in ovulatory patients with PCOS, the  $\alpha\beta 3$  integrin, HOXA-10, HOXA-11 and the expression of insulin-like growth factor (IGFBP-I) binding protein is decreased during the secretory phase. Literature considerations on the expression and regulation of  $\alpha\beta 3$ -integrin show that this protein may represent a marker for the human implantation process.

#### FSH gene polymorphism

FSH plays an important role in maturation of ovarian follicles, dominant follicle selection in the ovary and aromatization of androgens. Dominant follicle selection is important for the reproductive function. FSH mediates its biological functions by binding through Follicle Stimulating Hormone Receptor (FSHR) expressed on Sertoli cells in testis and granulosa cells of the ovary (5). Several polymorphisms have been identified in the FSHR gene, of these rs1394205 (A/G) polymorphism located in promoter and in exon 10, two strongly

linked rs6165 (A/G) and rs6166 (A/G). Polymorphism rs1394205 (A/A) genotype is associated with reduced expression of FSHR gene. FSHR gene polymorphism rs6166 (G/G) genotype in PCOS women is associated with amenorrhea or anovulation and longer menstrual cycles and hyperandrogenism. High levels of serum FSH were found in PCOS patients with rs6166 (G/G) genotype proving the presence of this allele may be less sensitive to FSH. Pharmacogenetic studies revealed the varied response of FSHR gene polymorphisms to exogenous FSH hormone in patients undergoing In vitro fertilization. Studies related to distribution of FSHR gene polymorphisms between the infertility subjects and their ethnic controls had shown inconsistent results. FSHR Ser680 was associated with higher levels of gonadotrophic hormones (FSH:  $P < 0.01$ , LH:  $P < 0.01$ ), and testosterone ( $P < 0.05$ ) and a higher frequency of hyperandrogenism ( $P < 0.04$ ). FSHR variants were strongly associated with the severity of clinical features of PCOS, such as levels of gonadotrophic hormones and the presence of hyperandrogenism, but not disease risk [6].



Dose finding Algorithm for PCOS patients

### Implantation failure in PCOS

There are increasing data suggesting that implantation failure can complicate achieving pregnancy in women with PCOS. In women with PCOS, who are anovulatory or oligo-ovulatory, the regulatory roles of progesterone are suboptimal or absent, and this results in relatively constant **unopposed action of estrogen in the endometrium**. There is increasing evidence of dysregulated expression of markers of uterine receptivity in endometrium of women with PCOS secretory phase. In vitro HOXA10 expression was directly decreased by testosterone, suggesting a role for androgen reduction in improving endometrial receptivity. Women with PCOS also exhibit significant differences in their complement of **steroid receptors and coactivators** when compared with fertile controls. PCOS endometrium overexpresses androgen receptors and fails to downregulate estrogen receptor- $\alpha$  in the window of implantation. Overall, decreased expression of uterine receptivity markers and dysregulation of steroid receptor expression and activity may contribute to the lower pregnancy rates observed in women with PCOS. **Weight loss and insulin sensitizers** have been shown to decrease circulating insulin and androgen levels, as well as improve reproductive performance in PCOS patients

### Conclusions

- Patients with PCOS represent a challenge for reproductive medicine.
- They present with many complications and challenges for IVF treatment.
- The use of a calculated low-dose stimulation strategy with step-up according to ovarian response may help in thoughtful management of these patients.
- Careful selection of FSH dose may help in mitigating the risk of OHSS.
- The choice of the starting dose of FSH has to be calculated by patient's basal AMH level, AFC, age, BMI and PCOS diagnosis.
- PCOS often show a poor response to COS

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## Embryology Corner

### Embryologist's dilemmas in Poor Responders – IVF or ICSI?



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Traditionally, in patients with non-male factor infertility, Intracytoplasmic sperm injection (ICSI) has been preferred to conventional IVF, primarily in order to avoid fertilization failure [1,2]. Over the years, the routine use of ICSI in this subset of non-male factor infertility with normal or mildly abnormal semen parameters has gradually expanded to include other indications, one of which is low oocyte yield. However, in poor responders with few oocytes and normal semen parameters, the choice of method of fertilization might be a debatable one. One notion that possibly drives the preference of ICSI over IVF in poor responders is the assumption that poor ovarian response with low number of oocytes is suggestive of poor egg quality and hence may be associated with an inherent inability to fertilize. Thus, in such patients, ICSI may help boost the likelihood of fertilization for such 'poor quality' eggs and ensure successful embryo transfer when the number of recovered oocytes is low.

However, a review of the literature suggests that the actual advantage of the technique when not strictly necessary is rather questionable [3]. Recently, the practice committee of the American Society of Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART) stated in a committee opinion that ICSI was not recommended for low oocyte yield since no clear benefit of performing ICSI was observed in these patients [4]. In another report in 2016, the SART data showed that ICSI resulted in fewer live births as compared to IVF which led the editor of Human Reproduction to issue an official statement that unequivocally stated that: **"In the three years under review, ICSI on faulty indications has prevented at least 25000 couples from getting pregnant"**. Therefore, ICSI

can no longer be considered to be like the 'therapeutic illusion' of old i.e. the patient who will get better without treatment will also do so with treatment. Therefore, in the present-day scenario, with an ever-increasing trend of ICSI being used as the method of choice, universally across the board, it becomes all the more necessary to investigate the true efficacy of ICSI over IVF, in order to ensure that it is not potentially being harmful in any which way to our patients.

Our group at the Centre of IVF and reproductive medicine at Sir Ganga Ram Hospital, New Delhi, was the first to undertake a prospective randomized controlled study in an effort to investigate the value of performing ICSI over IVF in poor responder patients, when four or less oocytes were retrieved and semen characteristics were considered adequate for conventional IVF. In our study, fifty-nine patients undergoing their first IVF-ICSI cycle with 4 or less retrieved oocytes and normal semen parameters in accordance with WHO 2010 criterion, were prospectively randomized after oocyte retrieval and were assigned to either the ICSI group, where sperm were manually injected into the oocyte(s), or the IVF group, where conventional group insemination was performed. Only fresh embryo transfers were included in the analysis. Primary outcome measures studied were fertilization rate per assigned oocyte, total fertilization failure rate, cycle cancellation rate on account of either total fertilization failure and/or subsequent absence of cleavage and clinical pregnancy rate per embryo transfer. Out of the 59 patients that were enrolled and randomized for the study, 31 cases were analysed in the ICSI group and 28 cases were analyzed in the IVF group. We found no significant differences in fertilization rates, total fertilization failure rates, cycle cancellation rates and clinical pregnancy rates per transfer between the IVF and ICSI groups (62.3 vs 62.8%, 10.7 vs 6.5%, 10.7 vs 16.1% and 12.5 vs 7.7% respectively). Our results clearly demonstrated that there was absolutely no benefit of performing ICSI over IVF in patients with extremely low number of retrieved oocytes in the presence of normal semen parameters. ICSI gives no advantage, whatsoever, over IVF in poor responders undergoing IVF with normal semen parameters.

In 2011, Luna et al. reported higher fertilization rates and clinical pregnancy rates in ICSI as compared to conventional IVF in patients with four or lower oocytes [5]. However, this study was limited by its retrospective nature. In contrast, our data was in concordance with other authors who previously stated that the use of ICSI in poor responders having normal semen parameters offered no advantages over conventional IVF [6-8]. Our results were also in good agreement with Ou et al. who investigated extremely low oocyte retrieval cycles and reported no difference in implantation or clinical pregnancy rates despite a higher fertilization rate with ICSI than conventional IVF [9]. Also, they found that there was no difference in incidence of total fertilization failure between IVF and ICSI. Similarly, Gozlan et al. [10] suggested that there was no benefit of using ICSI in patients with a single oocyte and normal spermatozoa.

ICSI is still the treatment of choice for treating couples with subnormal semen parameters and has revolutionized the management of severe male factor infertility [11]. But, the high fertilization and pregnancy rates achieved prompted many centres to adopt ICSI also in cases without severe male factor. However, in the face of recent evidence, it is now important to recognize the fact that ICSI may not be an effective replacement for IVF in all types of infertility. Our data clearly shows that performing ICSI when only a few eggs are available for insemination is not advantageous, and probably it is only more expensive and time consuming. Moreover, in patients with only one or two oocytes, ICSI could prove to be rather damaging, since injecting oocytes could always lead to oocyte degeneration and hence ICSI could potentially deprive a patient with only one egg, a chance of a successful embryo transfer. A conventional overnight insemination may also offer an added advantage of allowing an immature oocyte to attain its full nuclear maturity and thus have a chance

at successful fertilization. This may be particularly game changing for women who have only very few or a single oocyte available for fertilization, as ICSI in such cases would completely negate any chance of spontaneous maturation and fertilization for the immature oocyte.

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## FROM THE DESK OF SIG POOR OVARIAN RESPONSE

### Young Poor Ovarian Responder



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Despite the widespread use of the term 'poor response to gonadotrophin stimulation', there is no standard definition of this term. Poor response implies a failure to achieve a certain number of follicles or particular serum oestradiol after subjecting the patient to controlled ovarian stimulation<sup>1</sup>. Poor ovarian response, in patients less than 35 years of age is a major challenge faced by the treating clinician. Especially when the number of retrieved oocytes is much less in spite of high doses of gonadotropins.

The term "poor Ovarian response" was first described in 1983<sup>2</sup> in patients on a standard stimulation regimen (150 IU human menopausal gonadotrophin), had a peak estradiol concentration of <300 pg/mL and who had poor follicle production leading to a smaller number of eggs retrieved and, therefore, a smaller number of embryos transferred<sup>3</sup>. Various studies have defined different cut offs for a poor ovarian response. The studies, which base their criteria on the number of follicles have taken as the number of stimulated follicles in a range of 1-5 follicles. Serum estradiol on the day of trigger in these patients was usually in the range of 900 -1850pmol/<sup>4</sup>. The current prevalence of Poor ovarian response has been reported to be in the range of 9 to 24%<sup>5</sup>

### Classification

Although Bologna criteria was the first major attempt to classify poor responders, but with passing time, the heterogeneity of this criteria was critically analysed and stated that the population of patients embraced by this definition was too heterogeneous in regards of woman's age, oocyte competence and risk factors<sup>6</sup>.

Lately working group of POSEIDON [Patient Oriented Strategies Encompassing Individualized Oocyte Number) from 7 different countries of the world have tried to stratify the poor responders and Introduced an intermediate marker of success in ART: the ability to retrieve the number of oocytes needed to obtain at least one euploid blastocyst for transfer in each patient<sup>7</sup>.

Young Poor responders (<35Years) can be classified By the Posiedon Group in categories 1 and 3. Although, group 1 patients had adequate ovarian reserve and were classified further in Group 1a, being 4 or less oocytes retrieval in previous cycles. The Group 1 b had a suboptimal response i.e 4-9 oocytes obtained after conventional stimulation protocols.

### Etiopathogenesis

Although the primary etiological factor in most of the cases is Idiopathic, but a few predisposing factors can be elicited in some of the patients .

- H/o Genital Tuberculosis in the past.
- Familial history - History of similar episodes amongst family members or premature ovarian failure history in these patients.
- Genetic causes
- Previous ovarian surgeries for cysts/ endometriomas
- Surgeries / Interventions like uterine artery embolization.
- Previous chemotherapy or radiotherapy
- Past history of multiple IVF and other fertility treatments factors of poor ovarian response can be categorized under the following heads.
- Immunological factors
- Environmental Toxins
- Stimulation cycle characteristics

Various mechanisms have been hypothesized, leading to a decreased response to supraphysiological FSH concentrations in cases with normal pituitary secretion of FSH and luteinizing hormone (LH). We feel that a weak response in the presence of a normal follicular pool (represented by normal FSH values) can be initially attributed to (i) a lower ability of these ovaries to develop an appropriate vascular network responsible for the distribution of the circulating FSH<sup>8</sup>(ii) a reduced capacity of these recruited follicles to amplify the action of FSH by secretion of insulin growth factor-I (IGF-I) by the theca compartment<sup>9</sup> and (iii) the presence of a decreased number of FSH receptors available within the granulosa cells<sup>8</sup> Immunoglobulins (Ig) that block granulosa cell growth in vitro may be present. Some of the blocking Igare specific for the FSH receptor

### Genetic Factors

These play a major role especially in the young poor responders, where the baseline level of the ovarian reserve test parameters ( AFC> 5: AMH >1.2ng/ml) are within normal levels. One of the main mechanisms studied was a decrease in the number of FSH receptors available in granulosa cells<sup>8</sup>, defective signal transduction after FSH receptor binding<sup>10</sup>, Variability in the gene that encodes FSH receptor [FSHR] gene, or the presence of a special FSH receptor binding inhibitor in the follicular fluid<sup>11</sup>, an inappropriate local vascular network for the distribution of gonadotrophins, the presence of autoantibodies against granulosa cells<sup>12</sup> , the presence of heterophylic antibodies<sup>13</sup>, lowered circulating gonadotrophin surge attenuating factor (GnSAF) bioactivity<sup>14</sup> and FSH receptor polymorphism could also result in an elevated value in patients with otherwise normal ovaries<sup>13</sup>. A lower ability of these ovaries to develop an appropriate vascular network responsible for the distribution of the circulating FSH<sup>8</sup>, and a reduced capacity of these recruited follicles to amplify the action of FSH by secretion of insulin growth factor-I (IGF-I) by the theca compartment. Fragile X mental retardation 1[FMR1] has been studied to be linked with a poor ovarian response in patients. A decreased growth hormone pituitary reserve has been identified in most of these patients, suggesting that the insulin-like growth factors system might be related to the vascularization of the ovarian follicle.

### Envoinrmental Toxins

Environmental toxins could impair ovarian function and cigarette smoking deserves particular attention. Cigarette smoking has been associated with reduced female fecundity<sup>15</sup>. The hypothesis that smokers reach the menopause earlier as compared to the non-smokers has been related to the poor ovarian reserve in these patients.

## Infections

Pelvic infections may impair ovarian function either through direct damage to the ovary or through indirect mechanisms. Bowman et al found the degree of pelvic adhesions correlated with the woman's basal serum FSH level even within normal range<sup>16</sup> A positive chlamydia serology was found to be higher in poor responders than in normal responders. Chlamydia trachomatis indigenous plasmid has been detected in ovarian tissue by DNA amplification in patients with poor ovarian response. Although, the ovarian affliction in genital Kochs patients is around 50%, a direct link of genital kochs and impaired ovarian response has been clearly established. In a recent study published in July 2018, a study of over 431 patients of treated genital kochs, showed a significantly lower AMH, antral Follicle count and oocytes retrieved as compared to an equivalent number of non tuberculous infertile patients<sup>17</sup>.

## Clinical Significance Of Poor Response

If a response to ovarian stimulation is suboptimal it may lead to cycle cancellation, but even in cases which reach oocyte retrieval the prognosis may be poor. It has been suggested that the greater the total dose of gonadotrophins required for oocyte retrieval the lower is the pregnancy rates. Furthermore, an initial poor response identifies a group of patients who are less likely to respond well in subsequent attempts. Despite increased gonadotrophin stimulation on subsequent attempts these women show a high cancellation rate varying between 24% to Even young women with a normal basal FSH level cancelled because of a poor response did poorly in subsequent attempts relative to those women who responded normally, and overall the prospect of achieving a pregnancy using their own oocytes is low.

## Management

The optimum COS protocol should focus on retrieving sufficient oocytes likely to lead to one euploid embryo transfer, without increasing the risk of ovarian hyperstimulation syndrome.

Various modalities have been applied in these patients.

## Protocol

An individualized Control Ovarian Hyperstimulation protocol is to be followed for all patients. The entire therapy needs to be tailored according to the patients' needs and characteristics.

## Use of GnRh Antagonist

Although the previous studies have shown that use of GnRh antagonist was preferred in cases of poor ovarian reserve but the recent Cochrane review stated that there was a moderate degree of evidence that the cancellation due to poor ovarian response was higher in women who received GnRH antagonist than those who were treated with GnRH agonist (OR 1.32, 95% CI 1.06 to 1.65; 25 RCTs, n = 5230, I<sup>2</sup> = 68%)<sup>18</sup>.

## Gonadotrophins

In patients with poor response as a rule the, higher doses of gonadotrophins have been used. Although Prospective and Retrospective studies did not report enhanced ovarian response and/or pregnancy rates when starting dose of gonadotrophins was increased up to 450 IU. In a recent meta-analysis of 14 RCTs including 2104 women it was observed that no evidence of a difference in pregnancy outcomes between low doses of gonadotropins and gonadotropins combined with oral compounds compared with high doses of gonadotropins in ovarian stimulation regimens<sup>19</sup>.

## Addition of LH/ r LH

LH helps in maintaining levels of adequate concentrations of intraovarian androgens and promote steroidogenesis and follicular growth. It has been observed that addition of r-LH with r-FSH in poor responders significantly increases number of oocytes retrieved with relative increase in clinical pregnancy rates. In a meta-analysis of eight trials, concluded that there was no significant improvement in the clinical pregnancy rate with use of recombinant LH.<sup>20</sup>

## Androgens (DHEA, testosterone)

Testosterone is known to increase the FSH receptor activity and acts by stimulating IGF-1 receptors. As a result of which there is an improvement in the number of follicles recruited, oocytes retrieved, implantation rate, clinical pregnancy rates and decrease in cycle cancellation rates.

## Dehydroepiandrosterone [DHEA]

DHEA is a precursor for testosterone in the follicular fluid in the oocyte. Short term administration of DHEA has shown to result in an improvement in AMH concentration, AFC, peak estradiol, number of oocytes retrieved, number of metaphase 2 oocytes and high quality embryos. According to Cochrane 2016, In women identified as poor responders undergoing ART, pre-treatment with DHEA or testosterone may be associated with improved live birth rates. The overall quality of the evidence is moderate. There is insufficient evidence to draw any conclusions about the safety of either androgen. Definitive conclusions regarding the clinical role of either androgen awaits evidence from further well-designed studies<sup>21</sup>.

## Role of Growth Hormone

This acts by increasing the sensitivity of ovaries to gonadotropin stimulation and enhance follicular development. It enhances oocyte quality by accelerating and coordinating cytoplasmic and nuclear maturation. In a meta-analysis of 7 RCTs including 251 patients Jevé et al observed that there was no significant difference in the clinical pregnancy rate although 4 trials reported an improved benefit in live birth rates.<sup>22</sup>

## Recent Modalities

Gonadotrophins cannot compensate for the absence of follicles in the ovary, therefore, COS in poor responders may benefit from the exploitation of multiple follicular waves within a single ovarian cycle, for instance, through luteal phase stimulation or double stimulation (follicular plus luteal) in the same ovarian cycle (DuoStim) protocols.<sup>12</sup>

Accumulation or pooling of oocytes following subsequent stimulations

Obtaining a large cohort of oocytes in poor responders by accumulating vitrified oocytes over several cycles of stimulation could result in higher live birth rate per patient and potentially reduce dropout.<sup>23</sup>

## Natural cycle / modified natural cycle

Natural cycles IVF with or without minimal stimulation can be considered as an easy and cheap approach to poor responders. Natural cycle IVF was associated with 50% cancellation rate due to premature LH surge, failed fertilization and overall clinical pregnancy rate was 10%. In Modified Natural cycle addition of GnRH antagonist and endogenous gonadotrophins reduced incidence of premature LH surge. A systematic review, including 19 studies applying different POR definitions, concluded that younger patients had higher pregnancy rates compared with older women<sup>24</sup>.

## Conclusion

Age of the patient still is one of the most important prognostic factor for response to controlled ovarian hyperstimulation. If a hyporesponse is precociously diagnosed, the increase of FSH dose and the addition of luteinizing hormone activity could be effective in preventing low Follicular Output Rate (FORT). Multiple adjuvants and therapies have tried, but have dubious role in management of poor ovarian responders. In young patients genetic factors and altered endocrinological efficacy at substrate level are responsible for an unexpected poor response to stimulation.

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# Managing Poor Ovarian Response

## ASKING THE EXPERTS



### PROF (DR) ABHA MAJUMDAR

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Director and Head  
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1. What is your preferred gonadotropin and what regime do you follow- Recombinant, HMG, Combination?  
**Ans:** Recombinant gonadotropins and biosimilars both. Regime: mostly fixed, but flexible for poor responders

2. Agonist/ antagonist for poor responder ?  
**Ans:** Antagonist protocol preferred

3. Maximum dose of gonadotropin given?  
**Ans:** 300 units of rec gonadotropin

4. Which adjuvants do you use ?  
**Ans:** Testosterone, LH, letrozole

5. Your experience of adding adjuvants to poor responder  
**Ans:** All act similarly

6. During stimulations at what situation do you quit the stimulation?  
**Ans:** I quit after 8 to 11 days of stimulation in IVF cycles

7. When do you not stimulate –

- Previous how many poor response cycles,- At my centre 2 cycles and from outside 3 cycles at 2 different centers.
- FSH above ?FSH above 18
- Any age cut off ? – 45 and above
- AMH below?-None – Do not take a cut off value
- AFC below? – AFC below 3 in both ovaries but not a parameter alone. AFC below 3 with simultaneous very low AMH



### DR UMESH JINDAL

**Executive Advisor - IFS  
Director  
Jindal IVF Centre and Sant Memorial  
Hospital, Chandigarh**

1. What is your preferred gonadotropin and what regime do you follow- Recombinant, HMG, Combination?

**Ans:** My general protocol is to start with pure recombinant FSH and then add rLH . The other option is to use mixed of FSH and HMG. Generally the ratio of FSH to LH remains 2:1

2. Agonist/ antagonist for poor responder ?  
**Ans:** I am using both protocols. Preferred is antagonist but agonist protocol is sometimes used for Poseidon 1A and 1B if there is discordance or recurrent cyst formation.

3. Maximum dose of gonadotropin given?  
**Ans:** I give upto 450IU of FSH. Very rarely I may go upto 600IU.

4. Which adjuvants do you use ?  
**Ans:** I routinely use DHEA three months before starting a cycle. I also have good results with testosterone gel and GH but the experience is limited

5. Your experience of adding adjuvants to poor responder-

- DHEAS- Does increase AMH and antral follicle count
- Testosterone- Does increase the recruitment of higher number of follicles.
- Growth Hormone- The use is limited because of cost factor. But it does improve outcome.
- LH- Yes I use both recombinant and urinary LH like activity in HMG as part of stimulation protocol.

**HOW  
THEY  
DO IT!**

6. During stimulations at what situation do you quit the stimulation?

**Ans:** I will discuss with a patient if there are less than three follicles regarding discontinuation. I would advise her to take a chance if she is young, not willing to go for donor oocytes and can afford a separate cycle of IVF

7. When do you not stimulate –

- Previous how many poor response cycles?- there are no fixed criteria. The decision is taken considering the overall prognosis, affordability and desires of the patient after full counselling and written consent.
- FSH above ? I Take a cutoff level of 10 IU. However in young women with fair AFC I take a chance after thorough counselling.
- Any age cut off ? – I would stimulate only occasionally above 40 years of age unless the ovaries are very good and patient is very keen and accepts low success rate despite good embryos or PGT-A.
- AMH below?- There is no single cut off value of AMH . The decision is taken in combination of all prognostic factors. A value less than 0.3 ng/ml is considered very poor prognosticator.
- AFC below ? – I would repeat here that there is no single cut off value of AFC also . The decision is taken in combination of all prognostic factors. A value less than 4 in both ovaries is considered very poor prognosticator.

## An IFS - ESHRE Initiative

### ESHRE - IFS JOINT CAMPUS MEETING

#### The First ESHRE Campus Course in India

Organised jointly by ESHRE SIG, Recurrent Pregnancy Loss and Indian Fertility Society on 'Improving Endometrial Receptivity - Problems and Solutions', at India Habitat Centre, Delhi on 16<sup>th</sup> Sept, 2018.

#### Organizing Committee



**PROF KULDEEP JAIN**  
Course Convener - IFS



**DR MARIA CHRISTINE KROG**  
Course Convener - ESHRE



**DR M GOURI DEVI**  
Chairperson - Scientific Committee  
President - IFS

#### Scientific committee

Dr Kersti Lundin  
Dr Cristina Magli  
Dr Maria CristineKrog  
Dr Sudha Prasad  
Dr Neena Malhotra  
Dr Pankaj Talwar

#### Faculty

Dr Maria Cristina Krog  
Dr Prof. Henriette Svarre Nielsen  
Dr Sonia Malik  
Dr Abha Majumdar  
Dr (prof.) kuldeep Jain  
Dr Hrishikesh Pai  
Dr Joes Miravet

Started with short inaugural program with overview and course description by Dr Kuldeep Jain and Dr Maria Cristina Krog and presidential address by Dr Gouri Devi, President IFS.

There were 10 lectures in 4 sessions. 312 delegates registered.

**Audience participation and interaction :** excellent, ample time for question and answers at the end of each session

Academic content was very good. All lectures were of high quality and were very informative.

**Audience feedback :** Feedback forms were given to participants : overall rating for academic content, information , quality of lectures , audience interaction and venue was very good to excellent . Few suggestions comments received like "More such programs to be organised in near future, highly academic program, very beneficial" etc.

#### Comments from international faculty :

**Dr Maria Christina Krog** "Just wanted to report back from a great joined campus meeting between ESHRE and IFS in New Delhi the 16<sup>th</sup> of September. It was a great pleasure for me to be part of this event, which was very well organized by IFS at the venue. The international faculty felt very well taken care of and enjoyed the discussions with the delegates. I was impressed how many attendants who participated from all over India and how engaged and interested they were in the topic."

**Dr Hennerette Nilsson** "Thank you so much for a fantastic time in India! Maria and I enjoyed every moment and was thrilled about your hospitality and the genuine interest in our talks and work in general."

**Dr Joes Miravet** "Thanks a lot for your invitation and for the magnificent organization. It was an honour to be part of the meeting. It was a great success!"



## IFS – A commitment to Education, Training and Research

### FROM THE DESK ETHICAL COMMITTEE

**DR SUDHA PRASAD**  
Member Secretary and Convenor  
Independent Ethics Committee, IFS  
President Elect, IFS  
IVF Coordinator, IVF & Reproductive  
Biology Centre, MAMC, New Delhi



Indian Fertility Society is an academic society which deals with fertility related problems. Any academic society is not complete without ethics committee. Independent ethics committee of Indian Fertility Society was established on 2nd November 2014. All ethical committee- Independent or institutional must be registered with DCGI as IFS independent ethical committee is also registered with DCGI.

Phase 0,1, and 2 trials are normally not done in country. Phase 3 is given very selectively. Basically, clinical trials of phase 4 or post marketing is done when pharmaceutical company has received clearance from DCGI to market in India. IEC of IFS is eligible to conduct these trials but before putting the projects for ethical clearance, permission from DCGI clearance of phase 3 trial must be confirmed. Harmful effects if discovered by Phase IV trials, may result in a drug being no longer sold, or restricted to certain uses. Responsibility of IEC is to assesses the investigators' competency to conduct the research and to safeguard the welfare of the research subjects. It evaluates the research design which should be sound and without any risks in the light of the expected benefits.

It reviews and approves all types of research proposals submitted by IFS fellows and its members after appropriate discussion. It also provides the facility to review the proposal for the researchers other than IFS members. It also reviews investigators qualifications for the proposed trial and to appropriate facilities for conduct of the study.

Proposal includes Introduction, Aims and Objectives, Sample size and how to do randomization and method of data collection, Inclusions and exclusions criteria, Materials and methods, proposed Statistical analysis, Review of literature with discussion and lacunae in the study, patient Information sheet in English and Hindi, consent form in Hindi and English, undertaking to take the responsibility if any adverse reaction and summary of the project. If project is to be conducted in hospital, permission to be taken from departmental scientific committee and head of Institution. All papers are to be signed by Supervisor and Co-supervisors.

We welcome all research proposals submitted by any researcher for Independent ethic committee of Indian Fertility Society!



**DR KD NAYAR**  
Convenor, Education Committee  
Sr. Vice President, IFS  
Chief Consultant & HOD  
Akanksha IVF Centre, Mata Chanan Devi Hospital

### FROM THE DESK EDUCATION COMMITTEE

The Education Committee is looking after the Diploma in Clinical ART (DCR) and Diploma in Clinical Embryology (DCE) courses-- Flagship programs of IFS.

These courses are now being conducted in Collaboration with AMITY University since 2017 and currently the 2<sup>nd</sup> Batch is undergoing the teaching and training. With the collaboration with Amity University, the original IFS Fellowship program had to undergo many changes so as to follow the UGC norms starting from Admission process to the teaching modules including Amity campus classes, mandatory attendance marking by the accredited centres. All these are new experiences for all of us to learn and to grow with. But once the last Batch of students( 2017-18) receive their Diploma certificates in the Annual convocation of Amity University in November, we may feel proud of IFS achievement.

The exit examination for the last batch (2017-18) were conducted in Amity University from 26<sup>th</sup> April to 28<sup>th</sup> April 2018. The protocol was to have examiners who have no candidates at their centre so as to remove any bias. Dr. Pankaj Talwar contributed immensely with the setting up of theory and viva voce questions. The eminent external examiners were Prof. Lakhbir Dhaliwal, Dr. Dheeraj Gada, Prof. Geeta Radhakrishnan, Dr. Randhir Singh, Dr. Prasan Vij, Prof. Renu Tanwar, Dr. Pankaj Talwar, Dr. Rashmi Sharma, Dr. Surveen Ghumman, Dr. Ila Gupta along with examiners from Amity University. The theory papers were marked by Dr. Tanya Bakshi, Dr. Rupali Bassi, Dr. Sweta Gupta and Dr. Nupur Aggarwal. All the 13 candidates in DCR stream and 5 candidates in DCE stream were successful and declared passed by the Amity University.

With the aim of spreading knowledge and training in the right direction, this year (2018-19) IFS Education committee has increased number of accredited centres all over India to increase the intake of students to 20 in DCR and 20 in DCE course. The Admission advertisement for these courses was given by Amity University in the National newspapers on 16th May. The entrance examination was conducted on 10th June 2018 in Amity University, Noida and included multiple choice questions followed by viva of each student. We acknowledged the efforts of Dr. Pankaj Talwar and Dr. Rashmi Sharma for setting up the theory question papers and the viva questions with high standards and complete secrecy so as to avoid any bias.

Dr. Gouri Devi, Dr. Pankaj Talwar, Dr. Sudha Prasad, Dr. Rashmi Sharma, Dr. Leena Wadhwa, Dr. Sweta Gupta, Dr. Surveen Ghumman along with me and the faculty from Amity University helped in conducting this entrance examination. 39 students appeared for the DCR stream and 9 students took the DCE entrance examination. After the examination, the merit list was prepared and the students were called for 1st counselling on 11th June. The counselling panel included Dr. Gouri Devi, Dr. Pankaj Talwar and me. The 2nd counselling was done on 20th June and last minute vacancies were filled by the 3rd counselling on 30th June. 18 candidates were selected in the DCR stream and 5 candidates opted for DCE stream and the education committee ensured that all the candidates were placed as per their merit rank. All the students have joined their respective centres.

It will be endeavour of the Education Committee to aggressively spread the word for these courses in future and ensure that all IFS chapters also to reach out to the eligible candidates from their areas in the next academic year so as to increase the number of students appearing for the entrance examination in order to further improve the standards.



## Fertility Science and Research Journal – An IFS Publication...

Fertility Science and Research, a publication of Indian Fertility Society, is a peer-review journal with triannual print on demand compilation of issues published. The journal's full text is available online at <http://www.fertilityscienceresearch.org>. The journal allows free access (Open Access) to its contents and permits authors to self-archive final accepted version of the articles on any OAI-compliant institutional / subject-based repository. The journal does not charge for submission, processing or publication of manuscripts and even for color reproduction of photographs.

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.

**EDITOR-IN-CHIEF**

Dr. Kuldeep Jain, Delhi

**EXECUTIVE EDITOR**

Dr. Bharati Dhorepatil, Pune

**ASSOCIATE EDITORS**

Col. Pankaj Talwar VSM, Delhi

Dr. Gita Radhakrishnan, Delhi

Dr. Abha Maheshwari, UK

**ASSISTANT EDITORS**

Dr. Surveen Ghumman (Delhi)

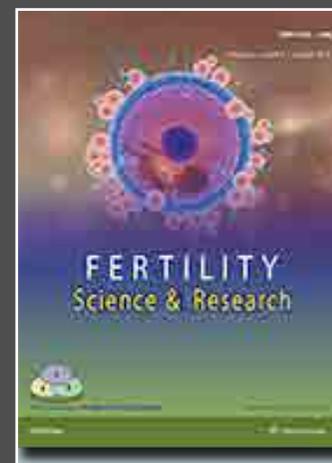
Dr. Neena Malhotra (Delhi)

Dr. Umesh Jindal (Chandigarh)

Dr. Shweta Gupta (Delhi)

Dr. Rupali Bassi Goyal (New Delhi)

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



### IFS E-PATHSHALA IFS - Reaching Every Corner of the Nation



**DR GOURI DEVI**  
President, IFS



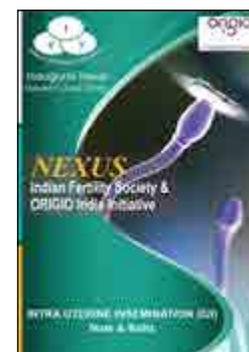
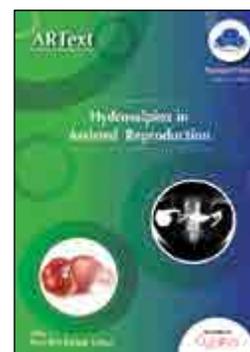
**DR PANKAJ TALWAR**  
Secretary General, IFS

**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.



**DR PANKAJ TALWAR**  
Chief Editor



**FERTILITY NEWS:** An ART news Flash which is brought out by IFS and compiled by Dr Shweta Gupta.



Compiled by  
**DR SWETA GUPTA**



**CATALYST :** Cochrane Review series which gives a brief on Cochrane reviews related to infertility brought out by IFS Compiled by Dr Mohan Kamath



Compiled by  
**DR MOHAN KAMATH**



## IFS - Representing India At Global Level

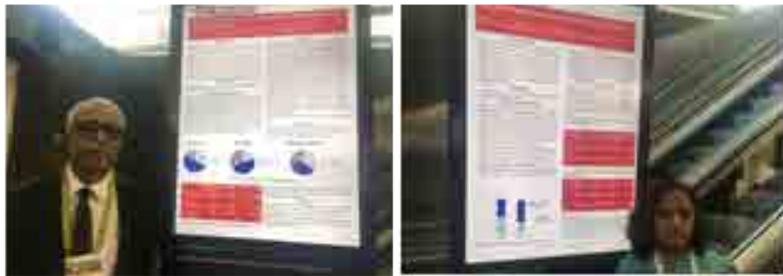
### IFS - Representation at 34<sup>th</sup> Annual Meeting of European Society of Human Reproduction & Embryology (ESHRE)

Held in Barcelona, Spain  
from 2<sup>nd</sup> - 4<sup>th</sup> July, 2018

#### Akanksha IVF Centre team lead by DR. K.D. Nayar

Presented 6 research studies.

1. P-721 Impact of patient's socioeconomic status on the outcome of IVF cycles in India - K.D. Nayar, P. Nayar, N. Agarwal, M. Singh, M. Gupta, G. Kant, R. Gahlot, D. Nayar
2. P-108 To evaluate outcome of methylxanthine theophylline in frozen thawed testicular sperm in intra cytoplasmic sperm injection cycles - G. Kant, K.D. Nayar, M. Singh, N. Sharma, R. Gahlot, K. Nayar
3. P-548 Yoga as an adjuvant to enhance the outcome of IVF treatment - P. Nayar, K.D. Nayar, M. Singh, N. Aggarwal, M. Gupta, R.A. Gupta, G. Kant, R. Gahlot, K. Nayar
4. P-550 Psychological influence of azoospermic male infertility diagnosis among men about to start in-vitro fertilization (IVF) treatment using donor sperm - M. Sharma, K.D. Nayar, P. Nayar, N. Agarwal, M. Singh, M. Gupta, G. Kant, R.A. Gahlot, K. Nayar
5. P-559 Counselling in decision making by couples for assisted reproductive technology - A key role in quality care - N. Agarwal, K.D. Nayar, P. Nayar, R. Gahlot, M. Singh, M. Gupta, G. Kant, D. Nayar
6. P-701 Optimal number of oocytes need to complete family per retrieval - R.A. Gupta, K.D. Nayar, G. Kant, N. Sharma, M. Singh, D. Nayar, Kapil Dev Nayar



**Dr Neeta Singh**, Professor, Division Of reproductive medicine, All India Institute Of Medical Sciences New Delhi, India.

Original work on Intralipids at ESHRE entitled "Effect Intravenous intralipid on implantation rate in women with implantation failure after IVF/ ICSI: A randomized controlled trial." At ESHRE 2018. The abstract was published in Human Reproduction volume 33, supp 1 2018.

#### Dr. Natchandra Chimote and Dr. Bindu Chimote

##### Oral Presentation

The oestro-androgen dehydro-epiandrosterone sulphate (DHEAS) may be a critical intracrine regulator of implantation and early pregnancy in Eumenorrhic non-PCOS women undergoing IVF

##### Posters

1. Serum 17-alpha-hydroxyprogesterone (Sr. 17- $\alpha$ -OHP): a precocious early indicator of implantation and gestational status in double embryo-transfer fresh IVF cycles - *Dr. Bindu Chimote and Dr. Natchandra Chimote*
2. Degree of blastocoel re-expansion is the single most determinant factor for enhanced live birth rates in vitrified-warmed single blastocyst transfer cycles - *Dr. Natchandra Chimote, Dr. Naazneen Shaikh and Dr. Bindu Chimote*

#### Dr Anupama Bahadur

To compare Clinical and metabolic effects of metformin versus combined therapy with metformin and myoinositol and D chiroinositol in PCOS women - A Randomized controlled trial

*A bahadur, H arora, J chaturvedi, A Raj, L Chawla, A Gaurav, K Khoiwal, R Kuncham, O Kumari, N Bhattacharya, A Yadav, S Kumari All India Institute of Medical Sciences*

#### Dr Monica & Dr Randhir Singh, Bhopal

Presented 3 Posters



##### Poster 1

RCT of Intrauterine or subcutaneous administration of GCSF before ET in resistant thin endometrium in IVF

##### Poster 2

RCT of single vs double IUI in ovarian Hyperstimulation Cycles

##### Poster 3

RCT-Depicting favourable IVF Outcome after ATT either on abnormal endoscopic findings or history of contact of tuberculosis

### PUBLICATIONS BY IFS MEMBERS

#### Dr Swati Garg

1. Uterine factors in infertility, practical guide in infertility. Editors: Dr.Gita Ganguly Mukherjee, Dr.Sudip Basu, 2018.
2. Role Of Clomiphene Citrate And Aromatase Inhibitors(Short And Long Protocols) In PCOS International Journal of Medical Sciences and Innovative research 2018;3:196-200

#### Dr Surveen Ghumman

1. Ghumman S, Saxena P. Natural Micronized Progesterone - New Vistas. Indian Obstet Gynecol 2018; 8(2): 35-41.

#### Dr Shweta Mittal Gupta

1. Uterine factors in infertility, practical guide in infertility. Editors: Dr. Gita Ganguly Mukherjee, Dr.Sudip Basu,2018.

#### Dr Natchandra Chimote

1. Chapters in Donald School Textbook of Human Reproduction and Gynecological Endocrinology
  - Semen Analysis
  - Effect of Environment and Infections on Semen quality
2. Chapters in Dr. Kamini Rao's Infertility Manual - Sperm Preparation Techniques Chapters in Dr. Kamini Rao's Infertility Manual - Sperm Preparation Techniques
3. Chapters for ISAR Embryology
  - Sperm Preparation
  - Human sperm cryopreservation

#### Dr. Natchandra Chimote and Dr. Bindu Chimote

1. Chapter in Practical guide in Andrology and Embryology OMICS: Metabolomics, Proteomics, Secretomics and Genomics- Its application in the viability score of oocyte and embryo.
2. Chapter in the Elsevier book series 'Vitamins and Hormones' Dehydroepiandrosterone (DHEA) and its Sulfate (DHEA-S) in Mammalian Reproduction: Known Roles and Novel Paradigms January 2018, Vitamins & Hormones 108, DOI: 10.1016/bs.vh.2018.02.001.
3. Chapters in Dr. Kamini Rao's Infertility Manual - Intra-uterine Insemination

### AWARDS AND FACILITATION IFS MEMBERS



#### Dr. Yogesh Kumar

Clinical Embryologist & Research Associate  
IVF Centre  
Maulana Azad Medical College

#### Congratulations

Qualified ESHRE- Clinical Embryology Certification Examination-2018

# IFS- Contributing To The Society And Touching Lives

## Free camp - IFS Punjab

IFS Punjab chapter organised free camp and public awareness program at village Lamra, Distt. Jalandhar. 62 patients were examined including infertile couples and PCOS. Patients were also counselled about weight reduction and treatment options.



## Adopting village Gumgaon –IFS Vidharbha

Under the banner IFS Vidarbha Chapter as promised adopted a village Gumgaon for treating the infertile couples present there free of cost and give them economic freedom for being happy parents. In lieu of the promise taken a free camp was organised where in more than 50 patients were checked and treated free of cost. The sarpanchpromised to support the good cause



## Fertility Open Day, Spreading awareness among public - IFS Kerala

IFS Kerala conducted a public awareness program named 'Fertility Open day' for the general public to make them aware about common causes of infertility and prevention. It was held at Kozhikode on 15<sup>th</sup> July 2018 at, where 32 couples participated. Discussions on with a Malayalam channel to broadcast the event as a monthly program.



## Flood relief activities contribution – IFS Kerala

Kerala was deeply affected by the recent flood situation. The rehabilitation works are on full swing across the state. Our chapter has collected 8 lakhs from our members and started conducting relief works through our own contacts. This includes cleaning of drinking water wells, organizing healthy sanitation facilities, house cleaning from mud and other pollutants accumulated inside the house during flood. We are on discussion with District collector of Waynad to adopt a village for providing health check-ups and to provide basic sanitation requirements. Members are liberally contributing to it.

## Awareness Programme on Reproductive Health –North East Chapter

On 27<sup>th</sup> of August an awareness programme on Reproductive health was conducted in Beltola college. Dr M.Rahman addressed the girl students. Around 350 girls attended the programme. There was a question answer session after the talk.



## Outreach programme Training the doctors in remote areas

An outreach programme, organized in joint collaboration of IFS and Cryocell, India Pvt Ltd.This comprised of two meetings 1<sup>st</sup> in Dimapur, a CME and the 2<sup>nd</sup> was at Kohima on 24.06.18



## 6<sup>th</sup> Embryology Preparatory Certification Course for ESHRE Exam

**REGISTRATION OPEN**

11<sup>th</sup> & 12<sup>th</sup>, December, 2018 (9am to 5pm)  
13<sup>th</sup>, December, 2018 (9am to 1pm)

### Highlight's:

- Renowned International & National Faculty.
- Opportunity to appear in Mock Exam similar to ESHRE exam.
- IFS course attendance certificate to all who appear in exams.
- IFS Embryology Certification to all who clear the exam.
- Will be highly beneficial in preparation of ESHRE Certification.

### Eligibility:

- MBBS/Post graduate or MSc/PhD in Life Sciences.
- Experience of three years working at an IVF laboratory.

Details on our website  
[www.indianfertilitysociety.org](http://www.indianfertilitysociety.org)

### President

Dr. Gouri Devi

### Secretary General

Dr. Pankaj Talwar

### Course Chairerson

Dr. Kuldeep Jain

### Course Director

Dr. Jayant Mehta  
Dr. Arne Sunde

### President



**DR GOURI DEVI**

### Secretary General



**DR PANKAJ TALWAR**

### Course Chairperson



**DR KULDEEP JAIN**

### Course Directors



**DR JAYANT MEHTA**



**DR ARNE SUNDE**

**Registration Fee**  
**10000 INR**  
**(Including GST)**

Payment accepted by – DD/ Cheques/ NEFT  
Account Name : Indian Fertility Society | Account No. : 50562010067180  
IFSC code : ORBC0101116 | Swift Code : ORBCINBBMGD  
Bank Name : Oriental Bank of Commerce | Branch : West Punjabi Bagh, New Delhi-110026  
please draw your cheques / DD in favour of "Indian Fertility Society" payable at Delhi

### VENUE

For Further Information Contact :  
**Dr. Pankaj Talwar - Secretary General**

IFS SECRETARIAT - 302, 3<sup>rd</sup> Floor, Kailash Building, 26, Kasturba Gandhi Marg,  
C.P. New Delhi - 110001 Tel: +91 9899308083, 9810790063, 9667742015 (whatsapp)  
E-mail: indianfertilitysocietydelhi@gmail.com Web: www.indianfertilitysociety.org

# Fertivision 2018 - Bringing The Globe Together

## 14<sup>th</sup> National conference of Indian Fertility Society

14<sup>th</sup>, 15<sup>th</sup> and 16<sup>th</sup> December, 2018 | Le Meridien, Kochi  
Organized by IFS, Kerala Chapter



### Organizing Committee



**Dr. M Gouri Devi**  
President - IFS  
Chairperson



**Dr. Pankaj Talwar**  
Secretary General - IFS  
Organizing Secretary



**Dr. Sudha Prasad**  
President Elect - IFS  
Scientific Chairperson



**Dr. Fessy Louis**  
Vice Chairperson



**Dr. K U Kunjimoideen**  
Organizing Secretary  
LOC



**Dr. M Venugopal**  
Scientific Committee  
Chairperson-LOC



**Dr. Parasuram G**  
Joint Secretary  
& Treasurer

IFS National Executive Members, All Chapter Secretaries & Local organising Committee Members

### Fertivision - Beyond borders

25 International Faculty  
Participating

The annual congress of Indian Fertility society have evolved over the last one and half decades as one of the most sought after congresses in the field of Reproductive medicine and attracts delegates beyond geographical borders.

This conference blends together an eminent group of 25 internationally-renowned faculty and a large group of experienced Indian faculty to present the latest developments in every phase of ART.

### Fertivision - Academic Collaborations

IFS & IFFS - Workshop  
on Ovarian Stimulation

The ovarian stimulation workshop will be conducted in association with IFFS. The embryology and cryobiology workshop is being conducted in collaboration with ACE, for the first time.

IFS & ACE - Workshop  
on Embryology and  
Cryobiology workshop

### Fertivision - Academics with Innovation

Workshop on a backwater  
cruise boat

One of these workshops will be on full time floating backwater cruise boat, the first of its kind ever conducted during any Fertivision so far.

### The Theme

'Beyond all limits - Breakthrough  
in excellence'

The local organising committee, Kerala Chapter of IFS has chosen 'Beyond all limits- Breakthrough in excellence' as the theme for this year's Fertivision. Assisted reproductive technologies are about more than achieving the highest success rates. For many patients, the way in which their dream is fulfilled is another very important determinant of success. With the proposed theme in mind, an exciting programme has been put together.

7 Workshops

7 consecutive workshops have been designed for the first day of the conference. These are namely - Ovarian Stimulation - DOs and DON'Ts, Evidence based Infertility Practice, Reproductive Surgery, Ultrasonography Imaging and Infertility management, Andrology & Semenology, Embryology & Cryobiology and Technological updates.

### Fertivision - An Emphasis on Solidarity & Friendship

IFS - ISAR

Another special feature of this conference is a unique solidarity session to be conducted in association with ISAR.

### Fertivision - Addressing Needs of all Sections

A Platform for Formal  
and Informal Interaction

It addresses the needs of practicing scientists, gynaecologists, reproductive endocrinologists, residents, and fellows who wish to review the specialty and update their knowledge in this rapidly changing and expanding field. The conference setting promotes extensive contact among speakers and participants with question periods, panels, and many opportunities for informal interaction. Care has been taken to ensure the postgraduates and fellows get ample opportunities to interact and clear their doubts with faculty of eminence.

### Fertivision - Go Green' with Academics

A mobile app will be utilized to access the material being presented, and electronic polling through the mobile app will be used to promote interaction with the speakers. It is a paperless conference.

## INTERNATIONAL FACULTY

Israel	UK	USA	Spain	UK	Spain	Israel	Singapore	UAE	UK	UK
Adrian Shulman	Dr. Arne Sunde	Bala Bhagavath	Basil C. Tartalitz	Ben Mol	Carmen Morales	Dan Levine	E Balaji	Gautam Allahbadia	Jayant Mehta	Tal Shavit
UK	Netherlands	Spain	Egypt	USA	Belgium	Portugal	UK	UK	Australia	Israel
Jayaprakash	Johannes Evers	Nikolaos P Polyzos	Osama Shawki	Parviz Gharagozloo	Paul Devyroy	Samuel dos Santos Ribeiro	Sesh Kamal Sunkara	Stuart Long	William Ledger	-Dov Bachar -Itai Gat -Jaron Rabinovici -Tal Shavit

For on line registration - [http://www.fertivision2018.com/registration\\_details.php](http://www.fertivision2018.com/registration_details.php)

Please send Registration Form along with cheque / draft at the following address

Mr. Vikas Sharma

Conferences International, B-220/2, 2<sup>nd</sup> Floor, Opposite Kali Masjid, Savitri Nagar, New Delhi - 110017. M: +91-9560493999 Email: [fertivision2018@gmail.com](mailto:fertivision2018@gmail.com)

# ACTIVITIES IFS - SIG

## SIG Poor Ovarian Reserve



Dr Gita Khanna  
(Convenor)



Dr Rupali Bassi  
(Co-Convenor)

### GUEST SPEAKERS

Dr M Gouri Devi (President IFS)  
Dr Pankaj Talwar (Gen Secretary IFS)  
Dr Sudha Prasad (Vice President IFS)  
Dr (Brig) R K Sharma (Patron, IFS)  
Dr Surveen Ghumman (Editor, IFS)

### Activity 1 CME on 9<sup>th</sup> September, 2018, Le Meridian Gurgaon

This was done in collaboration with the Gurgaon Obstetrics and Gynaecology Society & Dr. Bindu Garg from Neelkanth Hospital. It was an interactive academic feast, attended by approximately 75 delegates. Great discussions on the newer management of patients with a diminished ovarian reserve in terms of personalized iCOH - protocols / embryological modifications and latest evidence based literature.

#### The learning points of the CME or conference

1. Evidence based management of the patients with poor ovarian response
2. Recent protocols and newer strategies in poor ovarian reserve.

#### Membership drive

Membership drive We managed to get 4-5 new registrations for IFS membership and do expect a few more in the coming times



### Activity 2 CME at Lucknow on 20<sup>th</sup> May 2018

Organizing Committee - Dr Gita Khanna, Dr Rupali Goyal

It was a short Post Lunch CME 1st Curtain Raiser meeting was held at Lucknow on 20th May 2018 at Hotel Fortune Park BBD

**The learning points of the CME or conference:** It was on ovulation induction in ART. There were two lectures, on ovulation induction in ART, with two separate lecture on ovulation induction in Intra uterine insemination and in vitro fertilization.

**Comment of chairperson/faculty:** It was a short inaugural CME, a curtain raiser to the further CMEs to be organized by the Special Interest Group of Indian fertility Society.



### Activity 3 - CME in Mirzapur

The CME was conducted in association with The Mirzapur Obstetrics and Gynecology Society. A very interactive CME, attended by a group of 100 gynecologists. We had a number of practicing infertility specialists and other practicing gynecologists. A very interactive panel discussion was conducted by Dr Gita Khanna. Overall well accepted and appreciated by all.

**Comment of chairperson/faculty -** More programs like this to be conducted in the remote areas of India, so that the management of patients is adequate and referral is done at the right time.



### GUEST SPEAKERS

1. Dr Ritu Khanna
2. Dr Neelam Ohri
3. Dr Meena Vishkarma



## SIG : Research and Methodology



Dr Sandeep Talwar  
(Convenor)



Dr Vandana Bhatia  
(Co-Convenor)

### GUEST SPEAKERS

Prof T. D. Chugh, Faculty Member Amritsar & Rohtak Faculty of Medicine, Kuwait Emeritus Professor Of NAMS

Dr Abhaya Indrayan, Biostatistics Consultant at Max Health Care, Consultant to WHO and the World Bank, Retired as Professor and Head, Department of Biostatistics at Delhi College of Medical Sciences

### CME on Research and Methodology on 28<sup>th</sup> Aug at Max Smart Hospital, Delhi

This CME was conducted for the first time in a gynae forum with a vision of putting across to the audience the importance and need of conducting a proper, structured research in our country. 30 delegates including senior faculty, post graduates and fellows attended the meeting. Prof T D Chugh highlighted some of the eye-opening facts about the present research scenario in our country. He emphasized on how to conduct a study in a correct and ethical manner and then publishing the same in good indexed journals avoiding plagiarism. Dr Abhaya Indrayan gave a brief insight about the importance and relevance of various statistical tests and their application according to the type of study. It was heartening to see such an interactive session.

#### The learning points of the CME or conference

1. Need for collecting more data and analyzing in a proper manner
2. Conducting a study in an ethical manner and publishing the same without plagiarism
3. Interpretation and relevance of statistical analysis and applying the same in correct manner.

#### Comments from the audience

It was a source of encouragement for all attending to collect data, share it with colleagues, analyze and publish it to help our patients in a better manner.

#### Comment of chairperson/faculty

"It was the need of the hour to do more research in our country and publish our own data for better understanding of our country specific problems and also make our presence feel on an international platform. Such meetings should be organized more often to take research forward in our country so that we have more publications which are recognized world wide"



## SIG Holistic Medicine, IFS

### CME on Iyengar Yoga 22<sup>nd</sup> June Hotel Shreeram International, Jodhpur



Dr Rajvi Mehta  
(Convenor)



Dr Shalini Gainer  
(Co-Convenor)



### local co-convenors



Dr Renu Makwana



## SIG: Counseling and Psychological Support

### Activity 1 - IVF Counsellors Training Program - Workshop held on 29<sup>th</sup> July 2018 at Courtyard Mariott, Mumbai

### Activity 2 - IVF Counsellors training program at Hotel Jaypee Siddharth, New Delhi on 30.9.2018



Dr Poonam Nayar  
(Convenor)



Dr Puneet Arora  
(Co-Convenor)

### GUEST SPEAKERS

Dr. Varkha Chulani  
Clinical Psychologist & Consultant  
Lilavati Hospital, Mumbai,

Dr. Mala Tanna  
Clinical Psychologist  
Fertility Clinic & IVF Centre, Mumbai

Dr. Poonam Nayar  
Clinical Psychologist  
Akanksha IVF Centre,  
New Delhi

## SIG PCOS



Dr Bharti Dhorepatil  
(Convenor)



Dr Rashmi Sharma  
(Co-Convenor)

### Activity 1 : CME on PCOS - From Adolescence till menopause on 30<sup>th</sup> August, 2018

Origyn Fertility & IVF under the aegis of IFS, PCOS - SIG organized a CME in Hotel Radisson BLU, Pashim Vihar, New Delhi on 30 August 2018 on "PCOS - from Adolescence till menopause".

There were 4 panel discussions covering PCOS in adolescents, PCOS & Infertility, PCOS - Pregnancy care and contraception, PCOS beyond reproductive years - metabolic Syndrome. In between the panels. There was a lecture by Dr Rashmi Sharma on the topic of "Role of Inositol and other adjuvants in the management of PCOS". It was a house full CME with participation of about 110 doctors. It was highly appreciated and interactive CME which covered each aspect of PCOS.

**The learning points of the CME or conference:** PCOS affects all aspects of a woman's life from adolescence till late age. There is need for more awareness about its treatment in adolescent age and beyond reproduction years. Pregnancy in PCOS is different than in normal woman and need special care.

#### Comments from the audience:

Highly appreciated the CME due to interactive nature of the discussion.



Three aspects of infertility counselling were covered - Routine Psychosocial Care in Infertility and Medically Assisted Reproduction - A guide for all fertility staff, Emotional Aspects to Infertility & Its Management, The woman, her partner and the caregiver and Fertility Counselling. Special situations were tackled in infertility management.

#### The learning points of the CME or conference

To familiarise counsellors and the clinicians regarding type of psychological support needed by the patient and how to best deliver the client centered care routinely for infertility.

# CHAPTER ACTIVITIES

## VIDARBHA CHAPTER

### Message From Chapter Secretary Dr Shilpi Sud



"Rising incidence of infertility has prompted an urgent need of creating awareness regarding the causes, symptoms and treatment modality of infertility. A need to educate each and every individual regarding reproductive health (male and female) should be the first agenda of health providers. There is also a need to clear various controversial topics regarding reproductive health and ultimately come to a consensus regarding the management of Infertility".

### Activity 1: Installation of IFS Vidarbha Chapter 2018-2020 and CME on Challenges on ART

With this aim and vision of "controversies to consensus" in mind the new Team of Indian Fertility Society (Vidarbha Chapter) Lead by Dr Shilpi Sud (Secretary) Nishad Chimote (Joint Secretary) & Dr Neelam Puniyani (Treasurer) was installed on 3<sup>rd</sup> of June 2018 at Hotel Centre Point by the hands of Dr K.D Nayyar Senior Vice President IFS Delhi & Dr Kaustubh Kulkarni Director Siddhulife Hospital( Mumbai) in the presence of Dr Rohini Dravid (Past Secretary) and Dr Natchandra Chimote ( Patron).



The Installation was followed by a CME on Challenges in ART ( Assisted Reproductive Techniques).The Chief guest Dr K. D Nayyar talked about the basics and Practical aspects of Intrauterine insemination while the Guest of Honour Dr Kulkarni spoke about the trends and Advances in Infertility. Dr Chaitanya Shembekar and his panel of experts consisting of Dr Sadhana Patwardhan, Dr Manjushri Boob, Dr Anita Singh, Dr Ashish Kubde, Dr Kalidas Parshuramkar, Dr Ritu Dargan, Dr Sangeeta Tajpuriya enlightened the audience regarding management of endometriosis.



**Learning points :** Endometriosis is a common cause of pelvic pain. It is not easy condition to diagnose as the symptoms vary from one woman to other and they are no specific, and controversy exists over the precise role of surgery in fertility desiring patients and further evidence is required . To enhance IUI results - Select Patient carefully, keep records and analyse them, do everything under one roof, do not do more than 4-6 IUI, know when to refer for IVF



**A few comments from the audience and faculty** - "It was an enthralling installation for IFS vidarbha chapter which saw more than 150 honoured footfalls from entire vidarbha. Faculty and audience had promising discussion and live chat on activities and programme to be conducted during the 2018 -2020 reign of Vidarbha IFS Chapter. The installation saw lot of individual queries and enthusiasm to join IFS and join hand for fertility services which IFS takes."

### Activity 2: Adopting village Gumgaon – A social cause addressed by IFS Vidharbha

Under the banner IFS Vidarbha Chapter as promised adopted a village Gumgaon for treating the infertile couples present there free of cost and give them economic freedom for being happy parents. In lieu of the promise taken a free camp was organised where in more than 50 patients were checked and out of it 20 were facing infertility issues which we are successfully treated free of cost.

**The local body head (sarpanch) said** "I am happy and enthusiastic about the whole affair and has promised to support the good cause"

**Dr Shilpi Sud, Chapter secretary stated** that "It was huge success seeing the small village where people came forward to get their infertility issues checked"



### Press Coverage



### Activity 4: CME on Cryobiology in Assisted Reproduction on 5<sup>th</sup> August 2018

CME started with Nishad Chimote's talk on how to set up a Cryobiology Unit. Dr. Bindu Chimote delivered a lecture on Advance in Cryobiology. Dr. N.M, Chimote delivered lecture on It is time to move towards " Freeze -All-Strategy which was quite absorbing. Dr. Mugdha Pathak talk on Oocyte Vitrification. Dr. Pranay Ghosh spoke on How to have 100% Cryo-survival in a vitrification programme while Dr. Gaurav Kant talk on Risk management in Cryopreservation in ART. Dr. Shilpi Sud, Chapter Secretary made welcome speech while Nishad Chimote Chapter joint Secretary proposed vote of thanks

**Learning Point:** Intricate differences between cryo techniques for oocytes, embryos and blastocysts, Useful guidance on when should freeze all be done, Practical protocols for cryopreservation in cancer patients and Important tips on improving vitrification-warming outcomes were discussed

**Comments from the audience** - "The Cryobiology in assisted reproduction and live workshop was an eye opener and quite progressive in knowledge for the doctors and embryologists who attended the workshop. The guest faculty Dr Pranay Ghosh lecture on 100% Cryo survival in a vitrification programme was highly appreciated and lot of queries were answered too. Mr Gaurav Kant's topic risk management in cryo reservation in art was equally interesting and quite a learning for all about risk management and it did stir lots of age old methods of management. Hands on demonstration of vitrification and warming was an adrenal rush for the city embryologist as they learned the way of vitrification and warming from Dr. Pranay Ghosh, Mr. Gaurav Kant and Mr. Nishad Chimote live."



### Press Coverage



### Activity 5: CME on Clinical Case Discussion on Fertility Issues On 31<sup>st</sup> August 2018

Dr. Atita Shinde Embryologist from Mumbai, Dr. Sadhana Patwardhan IVF specialist Nagpur and Dr. Shobha Gandhi IVF specialist Nagpur were expert on Fertility issues.

**Clinical Cases** - Dr. Sumeet Baheti presented a case on Massive hematuria with hemodynamic instability-complication of oocyte retrieval, Dr. Yamini Kale presented a case on Unravelling the endometriosis engima surgical Management to fertility options. Dr. Madhuri Gawande presented cases on Fertility solutions in Gynaec Cancers- Borderline Ovarian tumor and Carcinoma Endometrium. Well known IVF specialist Dr. Sadhana Patwardhan discussed the risk of ovarian stimulation in case Ca breast looking for fertility preservation. Miss Atita Shinde, embryologist from Mumbai explained the method of oocyte freezing and thawing and how it is different from embryo thawing.

**Learning Point:** To avoid complication related to oocyte retrieval, in a case of endometriosis, ovaries should be mobilised during laparoscopic surgery if performed before IVF. In a case of Grade III/IV endometriosis after adhesionolysis and correction of ovarian position, patient taken IVF immediately. In a case of borderline ovarian tumour patient had history of multiple ovulation induction with clomiphene which is a risk factor for Ca Ovary. Oocyte freezing is a good option for woman prior to chemotherapy & radiotherapy as a fertility preservation. Pre-pubertal girls need ovarian tissue cryopreservation

**Comments from the audience** - Audience appreciated the clinical discussion on each case.

### Activity 3: World Embryology day celebrated on 26th July 2018 CME on Art of Embryology 26 July 2018 at Hotel centre point

History of Louise brown and Dr Bob Edwards was presented by Dr Shilpi Sud . Nishad Chimote spoke on Embryology lab setup, Selection of sperm for IVF & ICSI by Ms. Atita Shinde, Selection of embryo : Day3 vs Day 5 which is better : ( NTTCB embryologist ), Role of culture media in ART ( Dr. Sayali Kale) ,Panel Discussion: Trouble shooting in Embryology Lab , Moderated by Dr. Natachandra Chimote with Rakesh , Nishad , Dr. Charu ,Dr. Bindu, Dr Sayali, Atita Shinde as panelist.

**Learning Point** - Significance of individual culture vs. Group culture, Pros and cons of single step vs. Sequential media, Knowledge about empty follicle syndrome and greater awareness about India's contribution to IVF, with specific reference to Dr. Subhash Mukherjee

**Comments from the audience and faculty**- "Art of Embryology CME was an extremely exciting and seat gripping event where in the audience and the faculty had both lion's share of conversation and debated in large on the methods of embryology in a friendly gesture. It was an interesting and learning junction for all who attended"

**Guest faculty said** "It was highly impressed with the enthusiasm of learning art of embryology by the attending young and enterprising embryologists."



### Press Coverage



### Executive Committee

- Secretary:** Dr. Shilpi Sud
- Joint Secretary:** Dr Nishad Chimote
- Treasurer:** Dr Nilam Puniyani
- Executive members:** Dr Bindu Chimote
- Dr Chaitanya Shembekar
- Dr Riju Angik
- Dr Amogh Chimote
- Dr Sushama Deshmukh
- Dr Deepali Shukla
- Dr Kanchan Sortey

## KERALA CHAPTER

### Message From Chapter Secretary Dr K U Kunimoideen

My vision for the kerala chapter is to organise a unique program named "360 degree Andrology" one day cme across all OG societies of Kerala. Its will be a pre structured cme on Male infertility. CME ppt prepared. 1<sup>st</sup> event scheduled at Calicut OG Society on 13<sup>th</sup> January 2018



### Activity 1: Fertility Preservation Navigator 8<sup>th</sup> April 2018

The Fertility Preservation Navigator, a CME initiative of Special Interest Group of Indian Fertility Society was organized on 8<sup>th</sup> April 2018 at Kochi, Kerala, by the Kerala Chapter of IFS in association with the Kerala Federation of Obstetrics and Gynecology and The Cochin O&G society. The CME was inaugurated by Dr M Gouri Devi, The National President of Indian Fertility Society at Hotel Radisson Blu, Kochi. DrGracy Thomas, the President of Cochin OG society was the Guest of 'honour. Dr Kunjimoideen, the Secretary of IFS Kerala Chapter, delivered welcome address and Dr M Venugopal, the Joint Secretary of Kerala Chapter expressed vote of thanks. DrPnakaj Talwar (The secretary General IFS) and Dr KD Nayyar(the Vice President of IFS) delivered felicitations. Dr M Venugopal, Dr KD Nayyar, Dr PM Gopinath, Dr M Gaouri Devi, Dr Jayesh Amin, Dr Kuldeep Jain, Dr Pankaj Talwar, DrFessy Louis, DrParasuram, Dr Vijayakumar, Dr Sunil Nayar, Dr Raju Nair and DrRamgopal Pillai were the Faculty, who presented various topics on Fertility Preservation. The panel discussion on Clinical scenarios in Fertility Preservation has generated lots of discussions. 52 delegates attended the CME and participated in discussions.



### Activity 2: Fertilvision 2018 Logo Release

The logo of Fertilvision 2018 was released by National IFS president and Organising Chair, Fertilvision 2018 DrGouri Devi in a colorful function held at Hotel Radisson Blu, Kochi.

Dr Pankaj Talwar, Secretary General IFS & Organising Secretary, Fertilvision 2018, Dr KD Nayar, Vice President IFS, Dr K U Kunimoideen (Organising Secretary), Dr Fessy Louis (Vice Chairperson), Dr Venugopal & Dr Parasuram(Joint Secretaries) have taken part in logo release function. Later on, the team from National Secretariat of IFS visited the Fertilvision 2018 venue and made necessary instructions to local organizing committee.



### Activity 3: ARTCON Kollam 24<sup>th</sup> June 2018

IFS Kerala chapter in association with Kollam Obstetrics and Gynaecologic society have organized a CME on Basics in Infertility and Hands on workshop on Semen processing for IUI, on 24<sup>th</sup> June 2018 at Raviz Resorts and Spa at Kollam, Kerala. Dr Pankaj Talwar, the National Secretary of IFS inaugurated the event by lighting the lamp. He delivered a talk on 'Endometriosis and Infertility- Current concepts', at a special session of IFS SIG on endometriosis. Dr Kunjimoideen, the IFS Kerala Chapter Secretary Presided over the Session. DrSathy M Pillai, DrSeneesh Kumar, Dr Venugopal, Dr Jeetendra Behra and DrHarikumar were faculties. Dr Sunil Nayar and Dr Feseena Seethi conducted the Hands on workshop on Semen processing for IUI. 84 delegates participated in the event.



### Activity 4: Fertility Open Day – IFS Kerala with a Social Cause

We have conducted a public awareness program named 'Fertility Open day' for the general public to make them aware about common causes of infertility and prevention. First session was held at Kozhikode on 15<sup>th</sup> July 2018 at, where 32 couples participated. We are planning to conduct this for various sections of society and also discussions are on with a Malayalam channel to broadcast the event as a monthly program.



### Activity 5: IFS Kerala – Contribution to a social cause - Flood relief activities

Kerala was deeply affected by the recent flood situation. The rehabilitation works are on full swing across the state. Our chapter has collected 8 lakhs from our members and started conducting relief works through our own contacts. This include cleaning of drinking water wells, organizing healthy sanitation facilities, house cleaning from mud and other pollutants accumulated inside the house during flood.



## PUDUCHERRY CHAPTER

### Message From Chapter Secretary Dr Papa Dasari

The vision of the chapter would be to start the academic Programmes in line with IFS and serve the infertile population in and around Puducherry and to promote the activities of IFS".



### Activity 1: Inauguration of IFS - Puducherry Chapter

Inauguration of IFS- Puducherry Chapter was undertaken on the auspicious Occasion of WHO day 7.4.2018 at Puducherry in Hotel Accord, between 2 to 2.30 PM. The Dignitaries were Dr. Kuldeep Jain, Dr. KD Nayar and Dr. Pankaj Talwar. The Inaugural Speech was given by DR. KD Nayar, Sr. Vice President , IFS. Dr.Kuldeep Jain spoke about the IFS activities and Dr. Pankaj Talwar read the names of the office bearers of the Puducherry Chapter of IFS and spoke about the Vision of IFS and the Contributions of the Predecessors.

Dr. Papa Dasari thanked the Dignitaries for forming the Pondicherry chapter specially Dr. Pankaj talwar who initiated it in March 2017.

Dr. Pankaj Talwar gave an enlightening talk on the ICMR guidelines from the inception to the current status and clarified many queries on Embryo donation, surrogacy. This was followed by Panel discussion on " Endometriosis in Infertile women" moderated by Dr. Papa Dasari in getting the views of the experts Viz:

Dr.Kuldeep Jain, Dr. KD Nayar , Dr. Pankaj Talwar. Dr. Chitra.T was also one among the Panel members. The discussion included queries on diagnosis and management of Stage I, II Endometriosis and views on Laparoscopic and ART protocols for Stage III and IV Endometriosis. The ART etext of IFS was taken as basis for discussion.



### Executive Committee

Secretary- Dr Paapa Dasari  
Joint Secretary- Dr Kubera NS  
Treasurer- Dr Chitra  
Executive members - Dr Jisha. R, Dr Latha Ch, Dr MS Nirmala, Dr Valsa Diana, Dr A. Esther Ruby, Dr Ashraf Ali M, Dr Priyanka Yoga Purani

## TAMILNADU CHAPTER

### Message From Chapter Secretary Dr PM Gopinath

We are planning to increase the membership and conduct bimonthly meeting with one key note and case based discussions. We had a genetic SIG group meeting and one CME in this year and plan to take part in fertilvision 2018



### Activity 1: CME on Fertility

Initiative of Special Interest Group 13<sup>th</sup> May 2018 at Chennai Attended by Dr Sangeeta Sinha and 60 delegates.



### Executive Committee

Patrons : Dr Mirudhubashini Executive Members : Dr Buaneswari, Dr A Charmila  
Dr Geetha Haripriya Dr Uma Maheswari, Dr Krithika Devi, Dr Rajeswari  
Dr Priya Sen Dr Manu Lakshmi, Dr Souwyaarop dash  
Founder Secretary : Dr P M Gopinath  
Joint Secretary: Dr Rajapriya Ayyappan  
Treasurer: Dr Ramani Chenniappan  
Joint Treasurer: Dr Priya Kannan

### Activity 6 – A social Cause Adopting a village

We are on discussion with District collector of Waynad to adopt a village for providing health check-ups and to provide basic sanitation requirements. Members have liberally contributed to it.

### Membership Drive

Enrolled 14 new members; all enrolled online

### Looking Ahead.....Fertilvision 2018

The activities towards the smooth conduct of Fertilvision 2018 at Kochi are on full swing. Now we are doing the works related with scientific program.

### Executive Committee

Secretary - Dr KU Kunjimoideen  
Joint Secretary – Dr M Venugopal  
Treasurer - Dr Parasuram G  
Executive Council - Dr Ramgopal Pillai,  
Dr Raju Nair, Dr Noushin, Dr Sunil G Nayar, Dr Cyriac Pappachan, Dr Sankalp Singh, Dr Fessy Louis

## WESTERN UP CHAPTER

### Message from the Chapter Secretary Dr JK Goel



Need of the hour is to create awareness among general masses about the prevention and the treatment available for infertility. Attitude, empathy and passion in our profession comes first then experience and then only the equipment. One has to add to his pool of knowledge by way of research. Individually we are a drop but together we are an ocean. I appeal and make my earnest request to dedicate ourselves for fulfillment of the mission of this chapter that is to advance health through education and innovation.

### Activity 1: Inauguration 21<sup>st</sup> June, 2018

The Inaugural Ceremony of IFS Western UP Chapter was held on 21<sup>st</sup> June 2018 organized by the department of Obst. & Gynae SRMS IMS Bareilly. Chief Guest of the ceremony was Sh. Dev Murtiji (Chairman SRMS Trust). This prestigious event was inaugurated by two eminent personalities, Dr. Pankaj Talwar (National Secretary General, IFS) & Dr. RituK hanna Joint Treasures IFS. The ceremony was also graced by Executive Members of Obst. & Gynaecology Society of Bareilly, Shahjahanpur, Meerut and Haldwani. Members of the newly formed executive body & executive council were present during the ceremony. The CME was attended in large number by clinicians, embryologists and post graduates.

Alone we are a drop, together we are an ocean



Commencement of the Inaugural ceremony with lamp lightening



Commencement of the Inaugural ceremony with lamp lightening



Inaugural Address by Dr. Pankaj Talwar



It was followed by an Inaugural address by Dr. (Col) Pankaj Talwar (Secretary General IFS)



Deliberation by Dr. Ritu K Hanna on the act

Ritu K hanna (Joint Treasurer IFS) focused on the activities of Indian Fertility Society

Dr. Pankaj Talwar in his deliberation clarified the medicolegal aspects of ART act. Various case scenarios were moderated by Dr. RituK Hanna with an expert panel which was a very interesting and informative session.

### Executive Committee

Chapter Secretary	Dr. J.K.Goel
Joint Secretary	Dr. NeeraAgrawal
Treasurer	Dr. Ruchica Goel
Executive members	Dr Lata Agrawal
	Dr Nutan Jain
	Dr Poonam Goyal
	Dr Anshu Jindal
	Dr Shashi Bala Arya
	Dr Jyoti Bhaskar
	Dr Shashi Singh

## GUJARAT CHAPTER

### Message From Chapter Secretary Dr Jayesh Amin



I would like to sensitise more members for IFS Gujarat chapter and create a different academic platform through webinar for doctors

### Activity 1. Fertility Preservation Navigator

The 1st inaugural meeting of "Fertility Preservation Navigator - an initiative of Special Interest Group" under the banner of Indian Fertility Society (IFS) which was held on 11th Feb 2018 at Novotel, Ahmedabad. The event was organized under the guidance of Dr. Pankaj Talwar (SIG Convener) and organizing team of IFS including local organizing chairperson - Dr. Jayesh Amin. The event brought together some 90 delegates. The chief guests - IPS Manjita Vanzara & RJ Devaki along with the IFS dignitaries lighted the lamp before starting the event. The event began with opening remarks of Dr. Pankaj Talwar who shared the overview of the program. The finale of the "Fertility Preservation Navigator at Ahmedabad 2018" was the panel discussion on the clinical case scenario. Dr. Pankaj Talwar & Dr. Gouri Devi held the moderator position for the panel discussion. The panel discussion had been successful at shedding light in the path towards fertility preservation. At last, Dr. Jayesh Amin concluded the event and thanked audience members and panelists for their contributions to the event.



### Activity 2. Symposium of shaping the future of Infertility on 24<sup>th</sup> June 2018

Symposium of shaping the future of Infertility under the banner of Indian Fertility Society (IFS) was held on 24th June 2018 at Hotel Lajwanti [Palanpur]. The event was organized by the team of IFS including Palanpur OBGY & Mehsana OBGY under the guidance of - Dr. Jayesh Amin [Chapter Secretary]. The event brought together more than 70 delegates. Tips in IUI by Paresh Patel, Bio Chemical Markers in Infertility by Dr. Anand Chaudhary, Choosing the Lectures were given on - Right Stimulation Protocol & What is New? By Dr. Nymphaealecha, Endometrium- A big Black Box. How to Optimise? By Dr. Arun Arora. How to reduce time in pregnancy Interval by Dr. Jayesh Amin and Guideline for Medical Management in PCO by Dr. C B Nagori. Dr. Raman Patel & Dr. Tushar Shah held the moderator position for the panel discussion. 7 panelists were invited for the extensive discussion - Dr. Jayesh Amin, Dr. C B Nagori, Dr. Arun Arora, Dr. Jay Patel, Dr. Paresh Solanki, Dr. Paresh Patel, Dr. Anand Chaudhary. At last, Dr. Jayesh Amin concluded the event and thanked audience members and panelists for their contributions to the event.



### Activity 3. CME on Recurrent Problems in Reproductive medicine on 9<sup>th</sup> Sept 2018

**Organizing committee**  
IFS Gujarat Chapter & Ahmedabad Obstetrics and Gynecology Society

**Guest Speakers**

1. Dr. K.D Nayar
2. Dr. Sonia Malik
3. Dr. Kamini Rao

The CME based on recurrent theme. Topics are as follows:

1. Recurrent IVF failure & its optimization - Dr. Sonal Kotdawala
2. Recurrent endometriosis - Dr. Sonia Malik
3. Recurrent ovulation induction failure- Dr. Kamini Rao
4. Recurrent IVF failure- Dr. Jayesh Amin
5. Recurrent implantation failure- Dr. K.D Nayar
6. Recurrent pregnancy loss- Dr. Sapna Shah

Event followed by panel discussion "Evidence base practice in infertility when to start when to stop?" Moderator Dr. Kamini Patel.

**The learning points of the CME or conference** - cleared the doubts about recurrent, got the knowledge on basic treatment of pregnancy loss and IUI.

**Comments from the Delegates** "Good scientific event"



### Executive Committee

Secretary: Dr. Jayesh Amin	Advisory Committee: Dr. Rajesh
Joint Secretary: Dr. Nimesh Shelat	Gorasia, Dr. Ajay Walia
Treasurer: Dr. Paresh Makawana	Council Member: Dr. Minesh Prapajati,
Joint Treasurer: Dr. Kokila Desai	

Dr Pooja Nadakarni, Dr Sanjay Desai, Dr Hitendra Somani, Dr Tejas Dave, Dr Bharat Thakkar, Dr Shailendra Rathod, Dr Paresh Patel

This event was attended by a total of around 96 delegates including guest speakers, resource faculties, and numerous delegates from various cities of UP and Uttarakhand. The event was very well appreciated by the dignitaries.

**Feedback from delegates** was very positive and complimentary on both professional and administrative arrangements. They stated that the sessions were informative. The faculty was overwhelmed by the response of the audience.

### Learning points CME

Many aspects were discussed which included medicolegal aspects of ART, Surrogacy bill 2016, Diagnostic criteria and management of PCOS in perubertal age group and management of infertility with PCOS.



### Press coverage

#### Activity 2. Research projects

- Role of Real Time PCR to diagnose Genital Tuberculosis in infertile women.
- Study of sperm morphology and motility using Strict criteria as a prognostic factor in Intrauterine Insemination.
- Ultrasonography and Doppler study to predict uterine receptivity in infertile patients undergoing embryo transfer.

#### Activity 3: Outreach Activities

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

2018
29/6/2018- Kasganj
27/7/2018- Rudrapur
28/8/2018- Haldwani
29/8/2017- Badaun
31/8/2017- Chandausi
and many more to come...

## UTTARAKHAND CHAPTER

### Message From Chapter Secretary Dr Anupama Bahadur



Every infertile woman is entitled to Motherhood and this includes access to treatment for her infertility. She should be entitled to an Insurance plan to cover her costs for infertility treatment.

### Activity 1: Inaugural Ceremony, 15<sup>th</sup> July 2018 Rishikesh

IFS Uttarakhand Chapter was inaugurated on 15th July 2018 at Hotel Amaris, Rishikesh. Lamp Lighting, Saraswati Vandana was followed by welcoming the delegates. Dr Gouri Devi, President IFS gave her Inaugural address which was followed by Dr Pankaj Talwar's, (Secretary General IFS) Vision for IFS Uttarakhsnd Chapter. Patron Dr Jaya Chaturvedi addressed the gathering of over 40 delegates from Rishikesh, Dehradun and Haridwar. An interactive Scientific Session soon followed with a talk on "Diminished Ovarian Reserve: What we need to know" by Dr Gouri Devi and "Medicolegal Aspects of Infertility managment & ICMR Guidelines" by Dr Pankaj Talwar. There was a Panel Discussion on PCOS conducted by Dr Anupama Bahadur & Dr Latika Chawla where the panelists answered simple queries raised by the audience. Vote of thanks and closing remarks followed.

**Comments from the delegates:** "As number of IVF centers are few in the state of Uttarakhand the audience was keen to attend more CMEs in infertility & IVF to update their knowledge."

**Comment of faculty:** Faculty suggested that "awareness camps for patients in the remote hilly regions of Uttarakhand must be started so that the couple gets investigated earlier and treatment is not delayed. We need to train more doctors and paramedical staff."

### Guest Speakers

Dr Gouri Devi - President IFS & Dr Pankaj Talwar - Secretary General IFS



### Executive Committee

Patron: Dr Jaya Chaturvedi  
Advisor: Dr Savitri Uniyal  
Secretary: Dr Anupama Bahadur  
Joint Secretary: Dr Latika Chawla  
Treasurer: Dr Ritu Prasad

Executive Members: Dr Sumita Prabhakar  
Dr Vinita Gupta, Dr Archana Tandon,  
Dr Arti Marwah Luthra, Dr Usha Joshi,  
Dr Vandana Grover, Dr Aditi Gupta

## CHATTISGARH CHAPTER

### Message From Chapter Secretary Dr Sangeeta sinha



My vision for IFS Chattisgarh Chapter is "Training at grass root level in this context giving free training to young gynaecologist, organising free awareness camps at the periphery, and ncuraging the youngsters for research and academics."

### Activity 1: National Infertility Conference Bhopal 21<sup>st</sup> July, 2018

Ovulation induction protocol and trigger in at Bhopal 21<sup>st</sup> July by Dr Sangeeta Sinha, National Infertility Conference.

**Salient points--**There should be flexibility in starting ovarian stimulation, there are two/three waves of follicular growth and antral follicle in luteal phase has similar development potential.

### Activity 2: CME and installation on 5<sup>th</sup> May

CME & installation on 5<sup>th</sup> May by Dr Geeta Radha Krishnan Vice President-IFS. Topic was - Where Does Endometriosis Hit The Hardest—Oocyte, Embryo, Endometrium. There was a very good interactive session and Dr Geeta really appreciated the audience.



### 3. SIG Reproductive Endocrinology Prog. 14<sup>th</sup> July Bilaspur

Trained (hands on IUI) 7 delegates and had talk on how to improve success by Dr Sangeeta Tajpuria, Nagpur and fibroid & infertility by Dr Abha Singh Raipur

### Executive Committee

Chapter Secretary- Dr Sangeeta Sinha  
Jt. Secretary - Dr Veronica Yuel  
Treasurer - Prakriti Verma

Executive Members- Dr Vijya Wakodkar,  
Palak Gauri, Nalini Madhariya, Jyoti Jaiswal,  
Neeraj Phalajani, Anuradha Tibrewal, Sushma Verma

## NORTH EAST CHAPTER

### Message from the Chapter Secretary Dr Mujibur Rahman



"Under the parent body 'outreach Program' CME s have been a success and more will be arranged in the peripheral and remote parts of India, so that Doctors can be trained in these areas."

### Activity 1: CME on Fertility Preservation

The 1<sup>st</sup> CME was conducted in Hotel Lily in Guwahati with Dr. M.Rahman as the organising Secretary. The local cancer hospitals were involved in the CME with the Director B. Barooah cancer institute was made the chief guest. Around 50 delegates participated in the CME. There was active discussion with some case presentations. The Q&A session was very interesting with a lot of delegates coming up with many questions. **There were speakers from Delhi and our General secretary Dr Pankaj Talwar was the guest of honour.**

### Activity 2: Outreach Programme

This was an outreach programme, organized in joint collaboration of IFS and Cryocell, India Pvt Ltd. This comprised of two meetings 1<sup>st</sup> in Dimapur, a CME and the 2<sup>nd</sup> was at Kohima on 24.06.18.

#### IUI workshop on 22<sup>nd</sup> June, 2018

On 22<sup>nd</sup> June an iui workshop was held in Dimapur in the state of nagaland ...50 delegates participated in the hands on workshop. **Dr M. Belho was the organising chairperson. Speakers in the workshop included Dr Gouri Devi, Dr Umesh Jindal, Dr Rupali Bassi, Dr M. Rahman**

#### IUI workshop and Round table conference on 23<sup>rd</sup> June, 2018

On 23<sup>rd</sup> of June we conducted another workshop and round table conference on IUI in Kohima attended by a group of 15 young practicing gynaecologists. **List of organizing committee :Dr. Pankaj Talwar, Dr. Rupali Goyal, Dr. Mujbir Rehman ( local organizing secretary)**



### Guest Speakers

Dr M Gouri Devi President, IFS spoke on the various ovulation Induction protocols, Dr Umesh Jindal spoke briefly on the evaluation of an infertile couple, Dr Rupali Goyal – spoke on role of Ultrasound monitoring in, Dr Mujbir Rehman- spoke on setting up of lab, Dr Masesano Behlo spoke on the ICMR guidelines in ART and Dr Suryakant spoke on the role of PRP and sperm fragmentation tests.

The level of enthusiasm and interaction amongst the group was great .

**Comments from Audience** – "This was the first such Initiative by a national body ever in this part.

**Comment from Dr Gouri Devi (President-IFS)** "This was an eye opener interaction with the north east part of our country, where no previous conferences have been performed by the national bodies."

### Activity 3: Awareness Programme on Reproductive health

On 27<sup>th</sup> of August an awareness programme on Reproductive health was conducted in Beltola college. Dr M. Rahman addressed the girl students. Around 350 girls attended the programme. There was a question answer session after the talk.



### Executive Committee

Secretary - Dr Mujibur Rahman	2. Dr.J.B. Bhattacharjee	7. Dr. Salim Ahmed
Joint Secretary - Dr Arpitasharma	3. Dr. M.Belho	
Treasurer - Dr. Digantachetia	4. Dr. Clarindya	
Executive members	5. Dr. PankajBarua	
1. Dr. DigantaDeka	6. Dr.FR.Choudhury	



# PUNJAB CHAPTER

## Message From Chapter Secretary Dr Harinder Kaur



"IFS Punjab chapter is totally committed to the core values of parent Society. Through IFS CMEs we do the best on latest updates on the various topics (like PCOS, Ovarian reserve, Thin endometrium, OHSS, Cryobiology and Fertility preservation) which guides us to treat in right direction and ultimately we will make a difference."

### Activity 1: IFS – PCON 2018

IFS Punjab 1st CME held on 11/3/2018 at Hotel president Jalandhar. Stalwarts Dr Gauri Devi (president ifs), Dr Surveen Ghumman, and Dr Neena Malhotra from Delhi and faculties from Punjab shared their experience.



### Activity 2: CME Ferticon

One day conference on 1 April 2018 at Lalit Chandigarh by ivy test tube baby centre, Mohali Obs and Gynae society. Faculty was invited from Delhi, Shimla, Haryana and Chandigarh. Around 200 delegates were participated in the conference.



**Press Coverage**

### Activity 3: Round Table Discussion

A round table discussion was organised by Punjab chapter of IFS on 15-5-2018.



### Activity 4: CME on Infertility Update

CME was organised by IFS Punjab chapter on 11-5-2018 at hotel Ramada on Infertility updates. Faculties and delegates from Punjab attended this CME



### Activity 5: IFS PUNJAB – Working towards a Social Cause – Free camp

IFS Punjab chapter organised free camp and public awareness program at village Lamra, Distt. Jalandhar. 62 patients were examined including infertile couples and PCOS. Patients were also counseled about weight reduction and treatment options.

**Press Coverage**

# RAJASTHAN CHAPTER

## Message From Chapter Secretary Dr Sangeeta Sharma



The vision of the chapter is to increase the awareness on infertility management in general, and updating on recent evidence based management in specific. The chapter also aims to benefit the society by planning awareness programmes (eg PCOS in schools and colleges) and free OPD (eg by adopting a village). We also plan to strengthen embryology part in the state.

### Activity 1: IFS Rajasthan Chapter CME held on 13<sup>th</sup> May 2018

IFS Rajasthan Chapter CME held on 13<sup>th</sup> May 2018 at Hotel Hilton, Jaipur on Recurrent Pregnancy loss and Recent Advances in Luteal Phase Support.

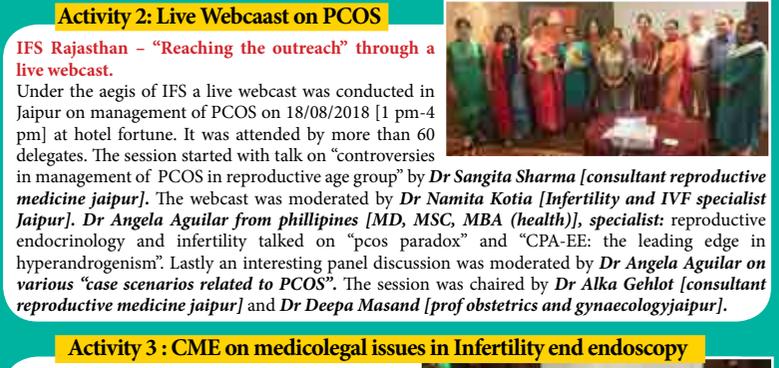
It was a successful CME with an attendance of 110 delegates (Doctors and Embryologists) across Rajasthan. It was overwhelming to have all the Senior doctors of the fraternity there.



### Activity 2: Live Webcaast on PCOS

IFS Rajasthan – "Reaching the outreach" through a live webcast.

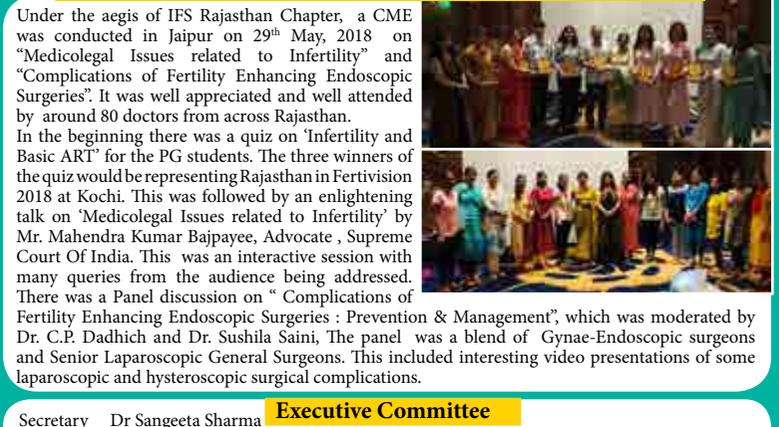
Under the aegis of IFS a live webcast was conducted in Jaipur on management of PCOS on 18/08/2018 [1 pm-4 pm] at hotel fortune. It was attended by more than 60 delegates. The session started with talk on "controversies in management of PCOS in reproductive age group" by **Dr Sangita Sharma [consultant reproductive medicine jaipur]**. The webcast was moderated by **Dr Namita Kotia [Infertility and IVF specialist Jaipur]**. **Dr Angela Aguilar from philippines [MD, MSc, MBA (health), specialist: reproductive endocrinology and infertility]** talked on "pcos paradox" and "CPA-EE: the leading edge in hyperandrogenism". Lastly an interesting panel discussion was moderated by **Dr Angela Aguilar on various "case scenarios related to PCOS"**. The session was chaired by **Dr Alka Gehlot [consultant reproductive medicine jaipur]** and **Dr Deepa Masand [prof obstetrics and gynaecology jaipur]**.



### Activity 3 : CME on medicolegal issues in Infertility end endoscopy

Under the aegis of IFS Rajasthan Chapter, a CME was conducted in Jaipur on 29<sup>th</sup> May, 2018 on "Medicolegal Issues related to Infertility" and "Complications of Fertility Enhancing Endoscopic Surgeries". It was well appreciated and well attended by around 80 doctors from across Rajasthan.

In the beginning there was a quiz on 'Infertility and Basic ART' for the PG students. The three winners of the quiz would be representing Rajasthan in Fertilvision 2018 at Kochi. This was followed by an enlightening talk on 'Medicolegal Issues related to Infertility' by Mr. Mahendra Kumar Bajpayee, Advocate, Supreme Court Of India. This was an interactive session with many queries from the audience being addressed. There was a Panel discussion on "Complications of Fertility Enhancing Endoscopic Surgeries : Prevention & Management", which was moderated by Dr. C.P. Dadhich and Dr. Sushila Saini. The panel was a blend of Gynae-Endoscopic surgeons and Senior Laparoscopic General Surgeons. This included interesting video presentations of some laparoscopic and hysteroscopic surgical complications.



Executive Committee		
Secretary	Dr Sangeeta Sharma	Executive Members:
Joint Sec.	Dr Nidhi Kabra	Dr Sunita Yogi, Dr Sapna Basandani,
Treasurer	Dr Hemant Chakrawarti	Dr Harpreet Bajwa, Dr Simi Sood
Advisors	Usha Shekhawat, Dr Narendra Gupta, Dr Anita Sharma	Mr. Rahul K. Sen

### Activity 6: Workshop "Cryobiology In Assisted Reproduction 9<sup>th</sup> September 2018

CME on cryobiology in ART organized at Hotel RAMADA (Jalandhar) on 9th September 2018 from 8:30 to 2:00pm (Sunday) sponsored by cryobiology system. 75 delegates attended the Conference and workshop. Dr. Pranay Ghosh (NEW DELHI) delivered the lecture [how to have 100% cryosurvival in vitrification programme] and then Dr Sushma Ved (NEW DELHI) highlighted the lecture about [risk management in cryopreservation in ART]. Dr. Nirmal Bhasin from Chandigarh delivered the lecture about [latest advances on cryobiology] and three speakers from Punjab Dr. Meenu Bhanot highlighted the lecture [how to setup a cryobiology unit] and then Dr. Harinder Kaur Oberoi delivered the lecture [oocyte vitrification] and Dr Sarbjit delivered the lecture about [is it time to move towards 'freeze all' policy? Embryologist conducted the workshop].

**Learning Points Of CME Or Conference:** Oocyte vitrification is a latest advancement in cryobiology, it is the time to move towards freeze all policies. Majority delegates learned the hands on procedure of vitrification and warming by workshop.

**Comments from Delegates:** "First time, they got the opportunity to learn basic and advance cryobiology including procedure how to do it".

**Comments From Faculty :** "Cryobiology is the backbone of ART clinic. It has many benefits in oocyte donation in patient taking cancer treatment and females with late marriages."

**Guest Speakers:** Dr. Pranay Ghosh, Dr. Sushma Ved, Dr. Ram Narayan, Dr. Nirmal Bhasin, Dr. Harinder Kaur Oberoi, Dr. Sarbjit, Dr. Meenu , Dr. Ram Dyal.



Executive Committee		
Secretary	Dr Harinder Kaur Oberoi	Executive Member:
Jt. Secretary	Dr Sukriti sharma	Dr Ritu J.Nanda
Treasurer	Dr Sarabjit Singh, Dr Monika Verma, Dr Rimmy Singla, Dr Jasleen, Dr Anupma Chopra	Dr Jasmine Dahiya
		Dr Shweta Nanda

# GREATER CHANDIGARH CHAPTER

## Message From Chapter Secretary Dr Swati Verma



I would like the Chandigarh chapter to impart quality education to our fellows and achieve excellence in the field of teaching, learning and research, and to deliver evidence based academic content in the annual conference of IFS at Chandigarh 2020 and encourage young members to improve communication and participation..

### Activity1: Fertility Preservation Navigator on 29<sup>th</sup> April

The Chandigarh Chapter got the opportunity to conduct Fertility Preservation Navigator on 29th April 2018, under the expert guidance of Dr Nalini Mahajan, Dr Pankaj Talwar and Dr Umesh Jindal. The event was attended by more than 80 delegates including Oncologist, Radiotherapist, Gynaecologist and ART specialist across Chandigarh, Punjab and Haryana. Talks by Dr Gita Radhakrishna and Dr M.Rehman were highly appreciated. We discussed almost every aspect of FP.

**Learning points** – How, when and where to refer cancer patient for FP



### Activity 2: 15<sup>th</sup> ART update on 2<sup>nd</sup> and 3<sup>rd</sup> June

- 15<sup>th</sup> ART update on 2<sup>nd</sup> and 3<sup>rd</sup> June 2018 at Forest Hill Resort, Solan, HP was conducted by joint efforts of Chandigarh and Himachal IFS chapters. More than 100 delegates got benefitted and got opportunity to interact with renowned faculty from North India including Delhi.
- Two pre-conference workshops on trouble shooting in ovarian stimulation and Ovum pick up and ET were conducted, followed by hands on training of ovum-pick up and embryo transfer on simulators to the participants.
- The plenary session started with the talk on “ART pregnancies: are they different” by Dr Kuldeep Jainand evidence based guidelines for ET by Dr Umesh Jindal.
- There was a blend of controversial topics and basics in ART. Controversies like FET for all, Blastocyst for all, Antagonist protocol for all and basics in ART like Clomiphene Vs Letrozole, insulin sensitizers, Gonadotrophins protocols in IUI were addressed very well. The concept was highly acclaimed by young ART specialist as well as experienced one.
- A panel on real life medico legal scenarios in ART was moderated by Dr Yashbala and expert opinion were taken by Dr. Neeraj Nagpal, IMA secretary Chandigarh, Justice V.K. Goyal, ART specialist Dr Umesh jindal, Dr Beena Muktesh, Dr Shalini Gaider and Embryologist Dr Sanjeev Maheshwari.
- Updates on techniques and laboratory aspect of PGD & PGS were given by Dr Ram Prakash. Relevant issues pertaining to male infertility were also highlighted.
- Talented young researches also presented their papers and poster presentation competition was also held.
- New executive committee was nominated and approved unanimously in the executive meeting and later rectified by the informal General house.

**Learning points**– How, when and where to refer cancer patient for FP, fine skills for OPU and ET.

**Comments from delegates** – The simulators were a big attraction and experience was appreciated by 80 delegates.

# BENGAL CHAPTER

## Message From Chapter Secretary Dr Suparna Banerjee



“As a new secretary with a new executive committee members we arranged a CME on 4th August 2018. As it was monsoon in Kolkata that time, the rain started in the evening, I was worried that the attendance would be poor due to bleak weather conditions. But to my utter surprise 48 doctors attended the CME. Audience asked many questions and our speakers cleared all queries. Lot of new things we learnt that day & I hope everyone is going to apply these in practice”.

### Activity 1: CME on IUI on 4<sup>th</sup> August 2018

It was an evening program arranged at Gateway Hotel. Guest speaker was Dr Abha Majumder. A group of 50 doctors who are infertility specialists and some gynaecologists who are already doing IUI but keen to know more about it and they have special interest in infertility were invited.

Dr Majumder discussed “optimising chance of IUI in unexplained infertility”. It was a fantastic interactive session. We learned some new facts, and she showed us some very recent evidence of performing IUI in unexplained sub fertility group.

The next session was interesting case discussion. Our executive committee member Dr Sudip Basu presented a very interesting case. He explained how he managed a difficult situation and there is no shame in asking your other colleagues to help in that difficulty, as ultimately we all want a good outcome of all our patients.



### Executive Committee

Secretary - Dr Suparna Banerjee  
Joint Secretary - Dr Piya Roy  
Treasurer - Dr Kausiki Roy

Executives members:  
Dr Rohit Gutgutia  
Dr Sudip Basu  
Dr Aindri Sanyal

Dr Madhumita  
Dr Debashree Ganguly  
Dr Madhab Chandra Das  
Dr Sunita Sharma

## ECOLOGISTS & ART SPECIALISTS



Dr Sandeep Talwar also stressed “upon the utility of USG to identify the exact direction of cervical canal.”



Dr kuldeep jain expressed “a need to develop an evidenced based classification on for the ease of Embryo transfer technique”.



- Academic sessions were followed by entertaining and rejuvenating cultural events prepared by organizing team.



### Press Coverage



### Executive Committee

Patron: Dr Umesh Jindal  
Secretary: Dr Swati Verma  
Joint Secretary: Dr Gulpreet Bedi  
Treasurer: Dr Sanjeev Maheshwari  
Advisors: Dr Umesh Jindal, Dr L.K Dhaliwal, Dr Yashbala, Dr Shalini Gaider

Nominated executive members: Dr Lovleen Sodhi, Dr Nirmal Bhasin, Dr Shanujit Sodhi, Dr Harpreet Sidhu, Dr Sheetal Jindal, Dr Bharti Joshi

## MP CHAPTER

### Message From Chapter Secretary Dr Monica Singh



IFS has a growing presence in Madhya Pradesh and its future looks bright. We want an easy approach to academics and hands on training to all gynaecologists. Research will get recognition and youngsters will be encouraged to do their best. Training should start early and in the right direction, that's going to be our goal.

### Activity 1: National conference on Infertility at Bhopal on 22<sup>nd</sup> July 2018, Annual State Conference - MP

National Infertility state MP Chapter Conference along with Chattisgarh Chapter was organized in Bhopal on 22 JULY 2018.

Around 20 National Speakers were present and 200 delegates were present.

Dr Kuldeep Jain, DrDheeraj Gada, Dr Ashok Khurana, Dr Manish Pandya and many others were among eminent speakers.

There was a Live USG Workshop conducted on 20 patients which was unique and well received and appreciated.

**The learning points of the CME or conference:** Recent advances in Infertility and live demo on embryology and ultrasound

**Comments from delegates:** Satisfactory, - More time needed for workshops

**Comment of chairperson/faculty Dr Kuldeep Jain** - "Good academic sessions" Dr Ashok khurana - "Good number of delegates with interactive session"



### Executive Committee

Chapter Secretary - Dr Monica Singh  
Jt. Secretary - Dr Anju Verma  
Treasurer - Dr Gajendra Tomar

Executive Members - Dr Viraj Jaiswal, Dr Abhaj Jain  
Dr Archana Srivastava, Dr Manju Rathi, Dr Sunita Pandey,  
Dr Yatindra Verma, Dr Asha Jindal

## UP CHAPTER

### Message From Chapter Secretary Dr Renu Makkar



"My Vision for UP Chapter is to engage and involve gynecologists of UP in understanding importance of infertility management and management of ART pregnancies, to develop simple protocol system 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 and to involve all members of Gynecology society of UP to participate in different activities of IFS like infertility training programs and CME's and Embryology Training programs."

### Activity 1: Report of the CME held on

The CME held on 14.07.2018 in Lucknow aimed towards discussing the impact of male factor (sperm quality) in ART procedures. The CME included distinguished speakers and panel members.

Mr. Mir Jaffer's presentation titled "Interpretation of semen analysis made easy for clinician" emphasized on the process of spermatogenesis, male infertility evaluation and its causes, semen analysis: usefulness and limitations, Pre-analytical, analytical and post-analytical, optional tests for characterizing sperm function and management of ART: IUI, IVF and ICSI. Dr. Kersi. M. Aver's presentation on "The rationale behind sperm preparation techniques" proposed the important points like, process of spermatogenesis and erectile dysfunction, embryology time scale, ART-incorporates three vital steps: recovery, survival and viability, semen quality and quantity analysis, aspermia conditions and how to cope up with it, cryotozoospermia conditions and how to cope up with it, sperm kinematics, physical properties of human semen and biochemical components of seminal plasma, sperm washing techniques, and role of Sertoli cells. Dr. Pratap Kumar spoke on the recent management of the endometriosis.

**Delegate Comment** "The presentations focused on the macroscopic/microscopic analysis of human semen. The basics and advances of sperm washing techniques. The speakers provided us with the detailed process of spermatogenesis and the causes of male infertility"



### Activity 2: Report of the CME held on 16.06.2018

The CME held on 16.06.2018 in Lucknow aimed towards discussing the impact of oocyte quality in ART result. The summary of the talks given and the main points discussed have been given in the following paragraphs.

Dr. Pranav Ghosh's presentation titled "Impact of oocyte quality in ART result" focused on how to - Evaluate criteria of oocyte selection, characterize markers of oocyte quality and factors affecting oocyte quality. The panel discussion was conducted on the Management of poor responders. The panelists included eminent doctors: Dr. Pranav Ghosh,

## HARYANA CHAPTER

### Message From Chapter Secretary Dr Neeru Thakral



"Stressed on more number of CME and hands on workshop in state of Haryana. These should be free for IFS members but payable for non members"

### Activity 1: CME on 'Challenges in infertility along with installation of new IFS Haryana Chapter for year 2018 - 2020'

Under aegis of IFS HARYANA Chapter and able guidance of secretary IFS Haryana Dr Neeru Thakral and joint secretary Dr Shalu Gupta we have successfully completed 2 CME and plan to do 3 CME along with annual conference in April 2019.

Our first successful CME on 'Challenges in infertility along with installation of new IFS Haryana Chapter for year 2018 - 2020' was on 18th July 2018 at Hotel Galaxy, Gurgaon. Almost 100 eminent gynaecologist, obstetrician and fertility specialist of Gurgaon and Delhi NCR attended the CME. Dr Gouri Devi was guest of honour and Dr Alka Kriplani was our chief guest.

CME started with mesmerizing talk of Dr Alka Kriplani on Adenomyosis and infertility. She enthralled everyone by her amazing laproscopic surgery videos.

Following this Dr Pankaj Talwar spoke on demystifying semen Analysis. After talk, he was bombarded with queries and doubts from audience, which he clarified very patiently.

This was followed by Lamp lightening, speeches by Dr KD Nayar and Dr Sonia Malik, vision of IFS by Dr Pankaj Talwar, installation of new team of Haryana chapter and vision of IFS Haryana chapter by Dr Neeru Thakral.

Dr Bharti Dorepatil came all the way from Pune to moderate Panel Discussion on "Recurrent Implantation Failure". The panel was co-moderated by Dr Neeru Thakral. Panelist and audience actively participated and were amazed by Dr Bharti clinical acumen.

**Delegate feedback:** The audience felt need of more interactive session like this - CME and workshop with fertility experts and should be organized.

### Activity 2: CME on "Updates in infertility" conducted on 12<sup>th</sup> August 2018

Second, CME on "Updates in infertility" conducted on 12th August, 2018 at Hotel Rivoli, Rohtak under the aegis of IFS Haryana Chapter hosted by Dr Meenakshi Chauhan and Dr Veenu Kadian.

**Faculty:** Prof. Alka Kriplani, Dr Gouri Devi, Dr Sonia Malik, Dr K D Nayar, Dr Pankaj Talwar, Dr Bharti Dhorepatil, Dr Neeru Thakral, Dr Rashmi Sharma, Dr Ila Gupta, Dr Shalu Gupta, Dr Tanya Buckshee, Dr Veenu Kadian, Dr Priya Varshney, Dr Reema Jain

It was attended by 93 gynecologists and infertility specialists from Rohtak and 8 nearby districts. Guest of honour was Dr Nirmal Gulati. The entire hall was spell bound by Dr. Sonia Malik's talk on most simple yet most confusing topic

"Tuberculosis and infertility". It cleared everyone doubts on when to start ATT. It was also emphasized that tuberculosis is notifiable disease and ATT should only be started post notification.

Wonderful panel discussions were conducted on "Ovulation induction" by Dr. Neeru Thakral and Dr Shalu Gupta. The discussion was kept to basic level so that every gynaecologist and beginners could understand do's and don'ts of ovulation induction. Second panel on "Endometriosis and infertility" moderated by Dr. Shweta Mittal Gupta and Dr. Veenu Kadian. Not ending debates on medical management versus surgical management continued.

Stalwarts of infertility like Dr. KD Nayar, Dr. Sandeep Talwar and Dr Smiti Nanda HOD PGI Medical college Rohtak & Dr. Mahendroo HOD Khanpur Medical college, were part of panel discussions.

**Learning points:** Adenomyosis and Infertility: Surgery versus medical management for adenomyosis - debate continues. Superiority of one treatment over other not established. Individualization and treatment both surgical and medical management/ surgery / medical management according to case can give optimum result. Semen Analysis: WHO criteria for assessment. Counselling and Newer Techniques - ERA and PGS discussed.



### Executive Committee

Patron - Dr Neeru Thakral  
Secretary - Dr Shalu Gupta  
Jt. Secretary - Dr Priya Varshney  
Treasurer - Dr Ragini Aggrawal  
Executive Member - Dr Vandana Narula,  
Member - Dr. Sangeeta Jain, Dr. Meenakshi Chauhan, Dr. Seema Mittal, Dr. Astha Chakravorty, Dr Veenu Kadian



Dr. Smriti Agarwal, Dr. Geetakhanna, Dr. Sunita Chandra, Dr. Aanchalgarg and the moderators were Dr. Renu Makkar and Dr. Amita Pandey.

**Delegate Comments** - "The session was interactive and very informative. Current topics related to the field of ART were discussed and every possible solution was discussed. It was a boon for the newcomers as they had the opportunity to know and learn the advances of ART".



### Executive Committee

Patron - Dr Chandravati  
Secretary - Dr Renu Makkar  
Jt. Secretary - Dr Surheeta Kareem  
Treasurer - Dr Manju Shukla  
Executive Member - Dr Geeta Khanna, Dr Rajul Tyagi, Dr Sunita Chandra, Dr Anshu Jindal, Dr J.K. Goel, Dr Amita Pandey, Dr Malvika Misra



# KASHMIR CHAPTER

## Message From Chapter Secretary Dr Syed Sajjad Hussain



**Vision :** Our Vision is to support and facilitate the process of conception through Assisted Reproductive Technologies (ART) for couples facing infertility and to promote interest in research findings in human reproduction and embryology to the concerned doctors.  
**Mission:** The mission of IFS Kashmir Chapter is to make the ART (Assisted Reproductive Technology) affordable & accessible to every infertile couple of J&K State at their door steps with quality expertise to achieve positive outcome.

## Inauguration of IFS Kashmir Chapter on 2<sup>nd</sup> December, 2018

More than 100+ Gynaecologists, Post graduates and doctors from all parts of the state attended the Inaugural event of IFS Kashmir Chapter today on 2<sup>nd</sup> December 2018 at Hotel Raddison, Srinagar from 5pm to 8:30pm. The eminent gynaecologists of J&K state Prof. Dr. Shahida Mir and Prof Dr. Aabida Ahmed-HOD SKIMS Maternity Hospital officially Inaugurated the IFS Kashmir Chapter in presence of Chief Guest-Secretary General Indian Fertility Society Prof Dr. Pankaj Talwar and Guest of Honour-Joint Secretary IFS Dr. Rashmi Sharma.

The renowned IVF Expert and Clinical Embryologist of MED AGE IVF Centre, Srinagar Dr. Syed Sajjad Hussain has been recognized as founder Secretary General, IFS Kashmir Chapter for the promotion of excellence in all aspects of ART and Reproductive Medicine in the state. HOD Gynae, Govt Lal Ded Hospital, Srinagar Prof. Dr. Shahnaz Teng recognized as Patron IFS Kashmir chapter. HOD Gynae, SKIMS Maternity Hospital Srinagar Prof. Dr. Aabida Ahmed recognized as Advisor IFS Kashmir chapter. Dr. Ambreen Qureshi Associate Prof. Gynae LD Hosp taken as Joint Secretary IFS Kashmir Chapter and HOU Gynae, Govt Lal Ded Hospital, Srinagar Associate Prof. Dr. Samiya Mufti as Chief Spokesperson IFS Kashmir chapter.

In her speech Prof Dr Shahida Mir congratulated the newly launched Kashmir Chapter of Indian Fertility Society especially the hard and dedicated work of its founder Secretary General Dr. Syed Sajjad and other team members and welcomed such academic & informative sessions of infertility & Assisted Reproductive Technology. In his welcome speech Dr. Syed Sajjad made special thanks to Prof Dr. Pankaj Talwar, who encouraged the chapter in one way or the other and contributed towards the realization of this IFS Kashmir Chapter and added that this Inauguration is a stepping stone to a forthcoming greater academic session of Assisted Reproductive technology and Reproductive Medicine in coming Summer in the Paradise i.e Kashmir, the dates of which will be finalized shortly after the valuable suggestions from our Patron, Coordinator and Advisory Board of IFS Kashmir Chapter and the dates may be announced in the coming **Fertivision-2018 at Kochi, Kerala on 15<sup>th</sup> of December.**

The doctors present in the event really enjoyed and learnt lots from the inspiring talk given in a very visually appealing form by Prof.Dr. Pankaj Talwar and Dr.Rashmi Sharma. It was an extremely informative, enjoyable and above all valuable session and the participant doctors were keen and eager to join the Indian Fertility Society in the earliest through IFS Kashmir Chapter.



## Executive Committee

- |                   |  |
|-------------------|--|
| Patron            | Prof. (Dr.) Shehnaz Teng   |
| Secretary         | Dr. syed Sajjad Hussain  |
| Jt. Secretary     | Dr. Ambreen Qureshi  |
| Treasurer         | Dr. Gulshan Ara, Dr. Samiya Mufti,   |
| Executive Members | Dr. Masooda Shah, Dr. Zohra Bano,<br>Dr. Kripal Kour, Dr. Iram Shafi,<br>Dr. Sajada Tak, Dr. Zeenat u Nisa |



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## ELIGIBILITY & ENTRANCE EXAMINATION SYLLABUS

### DIPLOMA IN CLINICAL ART

**Eligibility:** Postgraduate in OB/GYN (MD/DNB). Registered with the MCI / State Medical Council. The candidate must be a life member of IFS.

**Entrance Examination Syllabus:** Clinical Reproductive Biology, Physiology, Anatomy, Endocrinology, Basic Embryology and Andrology, Clinical Genetics.

### DIPLOMA IN CLINICAL EMBRYOLOGY

**Eligibility:** MBBS/Postgraduate in Medical Sciences or M.Sc./Ph.D in Life Sciences or Veterinary Sciences (Regular Course) from recognised institute in India.

**Entrance Examination Syllabus:** ICMR Guidelines, Basic Human Embryology, Human Cell culture, Genetics, TOM, Basic Semenology, Anatomy, Physiology & Pathology of Reproductive Biology.

**Entrance Examination Annually**

Amity University, Sec-125, Noida (New Delhi NCR) | Tel: 98-160-26719, 98-105-66870 | [www.amity.edu](http://www.amity.edu)

IFS Secretariat: Akanksha IVF Centre, A 3/7, Janak Puri, New Delhi-58 | Tel. : 98-993-08083, 011-45682024

Email: [indianfertilitysocietydelhi@gmail.com](mailto:indianfertilitysocietydelhi@gmail.com) | Website: [www.indianfertilitysociety.org](http://www.indianfertilitysociety.org)



The  
ultimate cover ...  
in times of  
Reproductive needs

With

# Vitacover<sup>TM</sup> Gold

Treat infertility & other Gynaecology Complication

## In male infertility

**CoQ10** Available as **Trans CoQ10** form

- Improves sperm count, functional sperm concentration, motility & morphology

Indian J Urol 2001; 18: 57-61

**Methylcobalamin** administration increases

- Sperm concentration 38.4%
- Sperm count 53.8%
- Sperm motility 50.0%

Methylcobalamin enhances the testicular functions, resulting in a increased output of motile sperm.

Ref: Isoyama R, KAWAI S, Shimizu Y et al. Clinical Experience with Methylcobalamin for male infertility. Hinyokika kyoe 1984;30:581-586



CoQ10	100 mg
Lycopene 6%	10000 mcg
Methylcobalamin	500 mcg
Vit C	100 mg
Niacinamide	50 mg
Vit B1	10 mg
Vit B2	10 mg
Vit B6	3 mg
Calcium Pantothate	12.5 mg
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 Tumours**

**Habitual & Spontaneous Abortion**

Tackles complicated conditions ... naturally