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InterMedics
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Indian FERTILITY Society

SONO-NAVIGATOR SERIES

**ROLE OF ULTRASOUND IN THE
DIAGNOSIS OF PCOS**

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most common endocrine abnormality in women of reproductive age and carries with it significant health risks, including infertility, endometrial hyperplasia, diabetes, and cardiovascular disease. Insulin resistance and hyperandrogenemia are the major culprits.

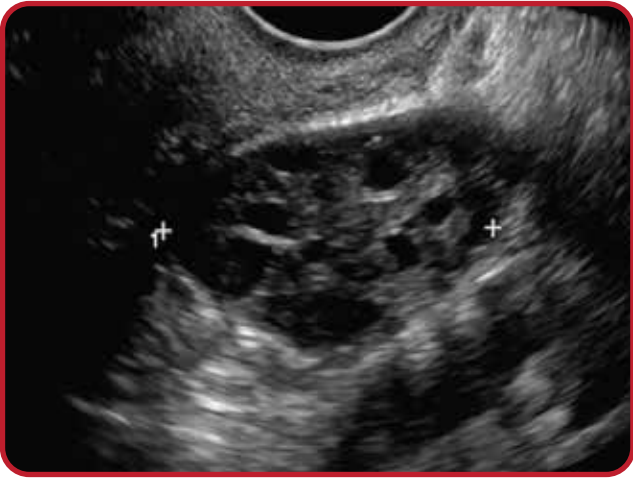
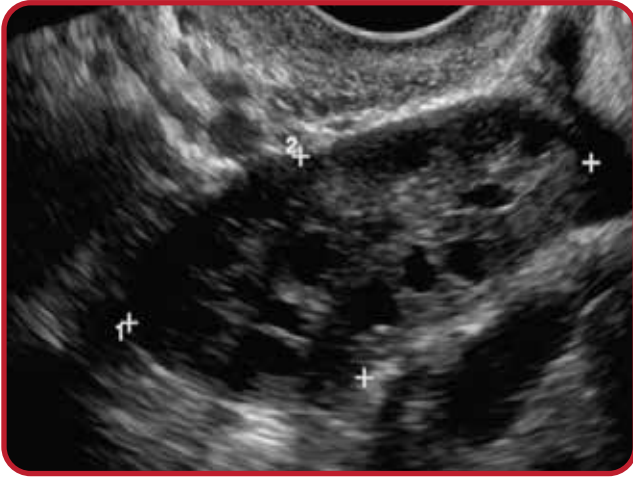
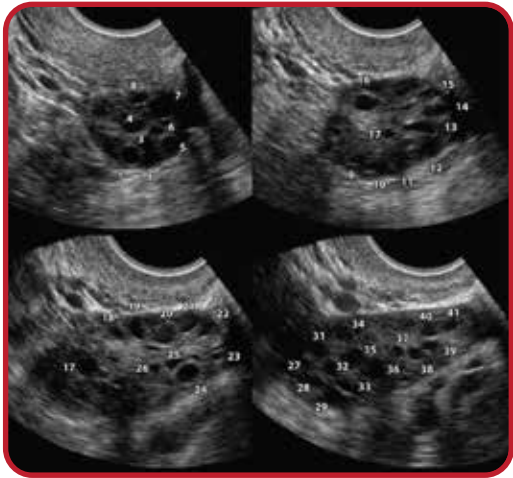
Ultrasound criteria for diagnosis

The 2003 joint **ESHRE/ASRM meeting in Rotterdam**¹ created a consensus definition for the polycystic ovary, which was reaffirmed by the Androgen Excess and PCOS Society in 2009 and subsequently incorporated into American College of Obstetricians and Gynecologists guidelines.

According to the **Rotterdam criteria**, polycystic ovaries are present when

- (a) one or both ovaries demonstrate 12 or more follicles measuring 2–9 mm in diameter, or
- (b) the ovarian volume exceeds 10 cm.³

Only one ovary meeting either of these criteria is sufficient to establish the presence of polycystic ovaries.

Ovarian volume	Number of follicles
Formula- $0.5 \times \text{length} \times \text{width} \times \text{thickness}$	The classic “string of pearls” appearance of a polycystic ovary should not be used.
The length and width are measured in the longitudinal plane (fig. 1). Placement of the US probe in the orthogonal plane provides the third diameter of the ellipsoid (fig. 2).	Number of follicles present across the entire volume of the ovary, according to the Rotterdam definition, should be used (fig.3).
 <p>fig. 1</p>  <p>fig. 2</p>	 <p>fig. 3</p>

Additional diagnostic clues to diagnosis of PCOS

1. **Increase in stromal echogenicity** - However it is a subjective observation only (fig. 4)
2. **Increased stromal volume** - correlates positively with serum androgen levels. However, no standardized method exists for determining stromal volume and overall ovarian volume correlates well with stromal volume in polycystic ovaries. Hence, stromal volume measurement alone has little role.
3. **Color Doppler of ovarian artery in PCOS** - Polycystic ovaries showed typical vascular pattern: **Increased stromal vascularity, increased peak systolic velocity and end-diastolic velocity, and a trend toward lower resistance index and PI values.** Overall, the most sensitive and specific predictor for the diagnosis of PCOS was PI.²

Role of 3D ultrasound

Three-dimensional (3D) ultrasound provides a new method for the objective quantitative assessment of follicle count, ovarian volume, stromal volume and blood flow within the ovary as a whole.

1. **Volumetric measurements** - PCO ovaries are not entirely ellipsoid and regular. So the ellipsoid formula does not give the exact measurement. Various display modalities in 3D mode allow to correct for any surface irregularities. More recently introduced rotational method possible through the **virtual organ computer-aided analysis (VOCAL)-imaging program** gives a better assessment of volume. **Most studies demonstrated an increase in volume in PCOS.** (fig. 5)
2. **Vascular flow assessment** - Stromal vascularity by 3D Doppler vascular indices (VI, FI and VFI) was found to be increased in PCO ovaries in few studies. (fig. 6)
3. **Sono AVC** - Sono-AVC mode allows individual identification and **automatic volume calculation** of cystic structures. In this case several follicles within ovary are seen, each one depicted in a different color. Use of this software showed better accuracy in determining follicular volume and reduced observer variation in follicle counts. (fig. 7)

Drawbacks of ultrasound criteria in diagnosing PCOS

- A. **Not all PCO ovaries constitute PCOD** - Data suggest that 23% of women of reproductive age will have findings of polycystic ovaries. However, only 5%–10% of these women will have classic symptoms of PCOS.
- B. **Transvaginal vs transabdominal ultrasound** - Data suggest that, compared with transvaginal US, the appearance of polycystic ovaries may not be detected at transabdominal ultrasound in up to 30% of women with PCOS.
- C. **Timing of scan:**
 - Regularly menstruating women should undergo scanning during the early follicular phase (days 3–5).
 - A history of oral contraceptive use should be elicited, since oral contraceptives cause a decrease in ovarian size, thereby decreasing the sensitivity of ultrasound evaluation.
 - Also, presence of dominant follicle >10 or any cystic structure in ovary should postpone examination to next menstrual cycle.
- D. **Adolescent and postmenopausal females** - The Rotterdam consensus group identifies no specific threshold for identifying polycystic ovaries in adolescents and postmenopausal females. **Transvaginal ultrasound cannot be used in sexually inactive adolescents** and it is difficult to differentiate polycystic ovaries as ovaries in adolescents are normally multicystic. Similarly, postmenopausal ovaries are smaller in volume.

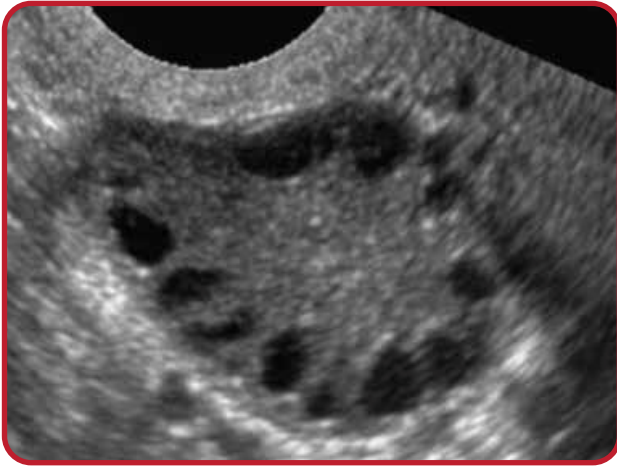


fig. 4: Increased stromal echogenicity in PCOS

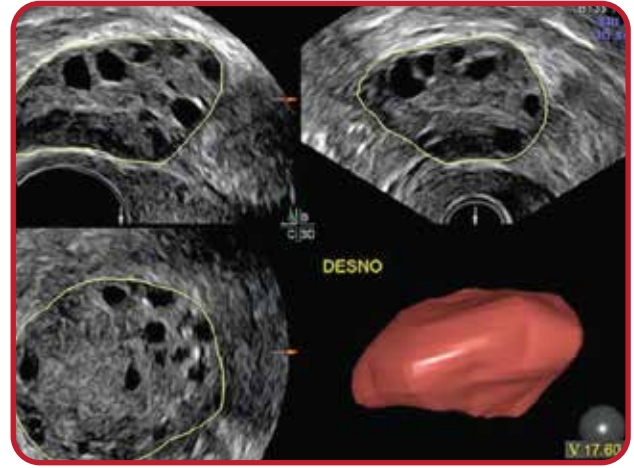


fig. 5: Ovarian volume calculation by VOCAL

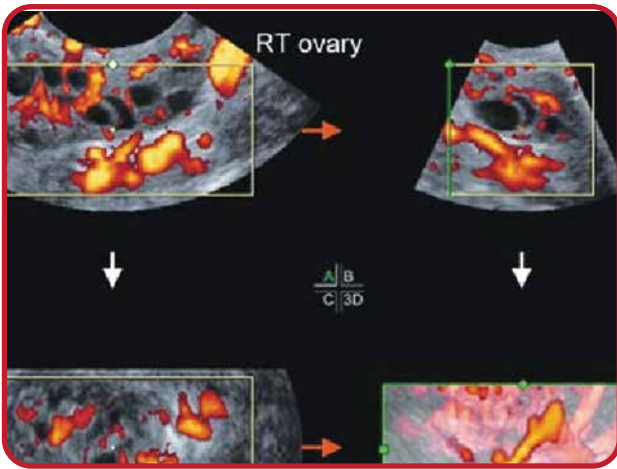


fig. 6: Increased stromal vascularity in PCOS

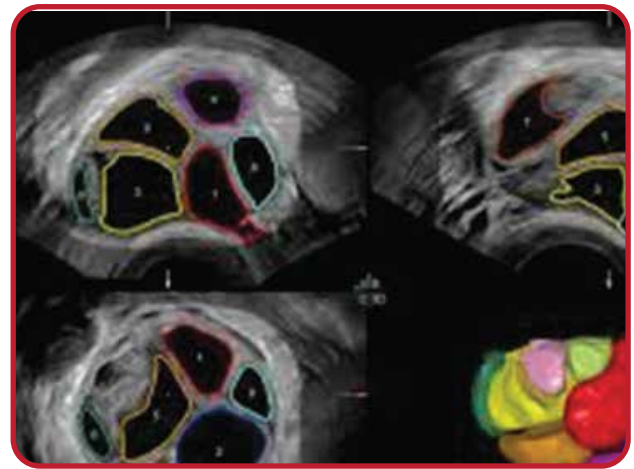


fig. 7: Sono AVC showing follicles in different colours

References

1. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril* 2004;81:19–25.
2. Aleem, F.A. and Predanic, M. (1996) Transvaginal colour Doppler determination of the ovarian and uterine blood flow characteristics in polycystic ovary disease. *Fertil. Steril.* , 15, 510–516.
3. Polson DW, Adams J, Wadsworth J, Franks S. Polycystic ovaries: a common finding in normal women. *Lancet* 1988;1(8590):870–872.

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Organised by



Theme: Beyond Tomorrow

15th Annual Congress of
Indian Fertility Society
FERTIVISION
2019 6-8 December
The Leela Ambience Hotel, Gurugram
New Delhi | India

First Announcement



www.fertivision2019.com

Invitation

Dear Friends, Welcome to *FERTIVISION 2019*

On behalf of the Indian Fertility Society (IFS), we are extremely pleased to announce and cordially invite you to the much awaited academic event – the **15th National Annual Conference - Fertilvision 2019**, to be held on **6th, 7th & 8th December 2019** at Hotel **The Leela Ambience, Gurugram, New Delhi / NCR, India**.

This conference is aimed to provide the most comprehensive academic platform in the field of Infertility and Assisted Reproductive Technology (ART) befitting the theme of the meeting “Beyond Tomorrow”

Renowned and leading expert faculty from around the world would gather and deliver talks in our cutting edge scientific program which will not only enrich your current knowledge and clear all doubts faced in day-to-day clinical practice, but will also enlighten you about the latest innovations and ongoing research.

A large number of renowned international faculties have already confirmed their participations till date. The pre-congress workshops on 6th December are specially designed for informal in-depth training with hands on sessions on simulators and live, where ever feasible. There will be 4 simultaneous running streams on 7th & 8th December covering a wide variety of topics, enabling you to choose the deliberations specific to your area of interest and clinical practice. We are having a dedicated hall for the esteemed embryologist friends.

The best oral and poster presenters under various categories and the quiz winners will be honored with special awards and prizes. Do join us in large numbers and update your knowledge with most updated current standards in clinical practice, as well as get inspired to innovate further to overcome remaining enigmatic issues!

The three days of scientific program will encompass didactic lectures, keynote presentations, panel discussions and orations. There will be 9 Pre-conference workshops based on Ovulation Induction, Ultrasound, Andrology, Embryology, Hands on Embryo Transfer, Ovum Pickup and PGS and more. These workshops will be in addition to the special state of the art workshops by the faculty from IFFS and ESHRE. We expect delegates across India, Sri Lanka, Bangladesh, Nepal, Middle - East Countries and African Nations and the arrangements are being made to accommodate more than 2500 delegates.

The exhibition area will be one of the highlights of the conference. Exhibiting provides tremendous benefits to both participating industry and the society. Tea, coffee and lunch will be served confluent with the trade area to allow optimal interaction between the trade companies and delegates during beverage and lunch breaks.

We invite you to participate in the Fertilvision 2019 and exchange your expertise with more than 2500 specialists in the field of Assisted Reproduction.

We look forward to your active participation and suggestions for successful conduct of the conference.

With Our Best Regards



Dr. M Gouri Devi
Organizing Chairperson
FERTIVISION 2019



Dr. Pankaj Talwar
Organizing Secretary
FERTIVISION 2019

and All Executive Committee of Current IFS team

Scientific Highlights

1

Fertivision 2019 Would be One of the Most Comprehensive Coverage on "Best Practices, Innovations and Progress in the Field of Infertility and ART" Being Conducted in India.

2

We Promise You Cutting Edge Academic Deliberations Delivered by Leading Renowned Expert Faculty from Around the world befitting the Theme of the Meeting "Beyond tomorrow"

3

In the Conference There Would Be 4 Simultaneous Halls Running with Legendary Faculty in Lead Interacting With You, Covering a Wide Variety of Topics, and Enabling You to Tailor the Program Especially to Your Area of Interest and Clinical Practice. We are Having a Dedicated Hall for the Esteemed Embryologist Friends.

4

Along With the Main Conference We are Having 9 Pre -Congress Workshops on 6th Dec 2019 Pertaining to the Burning Issue in ART.

5

We Welcome You and Offer You This Opportunity to Showcase Your Research Work on a Prestigious National Platform and Enhance Your CV.

6

Scientific Quiz for sharp talented young minds with primary rounds conducted by various IFS Chapters across the country and abroad

7

Several Prizes and Awards for Best Paper, Poster and Quiz winners

8

Enjoy the Evenings With Exciting Social and Cultural Program

9

Sightseeing Tours in and Around Delhi Organized Professionally by Leading Event Management Teams.

10

A Great Opportunity for All of Us to Amalgamate the Most Updated Current Standards in Our Clinical Practice and Look Beyond Tomorrow

Limited Seats

Choose from 10 Pre Conference Workshops | 6 December

1) <i>IFFS Workshop on Do's and Don'ts in Ovarian Stimulation</i>	7) <i>Total Quality Management</i>
2) <i>Reproductive Surgery</i>	<i>Pre Lunch Workshop (0900 - 1300 Hrs)</i>
3) <i>Ultrasonography Imaging In Infertility</i>	8 A) <i>Holistic Medicine and Patient Counselling</i>
4) <i>Andrology & Semenology</i>	<i>Post Lunch Workshop (1400 - 1700 Hrs)</i>
5) <i>Ovum Pickup and Embryo Transfer (With Simulators)</i>	8 B) <i>Publish or Perish</i>
6) <i>Cryobiology</i>	9) <i>PGT and Genomics</i>

Early Bird Reg. Ends 1st September

Registration Details

Category	Early Bird Fees Till 1st September 2019		Regular Fees Till 15th October 2019		Onspot	
	IFS Member	INR 10500		INR 12500		INR 14500
Non IFS Member	INR 12500		INR 14500		INR 16500	
Conference Registration plus Life Time IFS Membership	Embryologist	INR 14500	Embryologist	INR 16500	Embryologist	INR 18500
	Gynaecologist	INR 15500	Gynaecologist	INR 17500	Gynaecologist	INR 19500
PG Students (No Dinner)	INR 6000		INR 7000		INR 8000	
Accompanying Person	INR 10500		INR 11500		INR 12500	
Foreign Delegates	\$ 350		\$ 400		\$ 500	

Inclusive of 18% GST

Register at www.fertivision2019.com

Venue:

**The Leela Ambience Hotel, Gurugram
New Delhi | India**



The Leela Ambience Hotel & Residences is located on the fringe of the Gurgaon Central Business District, fifteen minutes from Delhi's International Airport and thirty minutes from Central Delhi.

In addition to 322 contemporary and world class five star deluxe rooms and suites, The Leela Ambience Gurgaon also features 90 residences (with one, two and three bedroom) fully serviced luxury Residences.

Multi Award winning restaurants include; Multi-cuisine all day dining– Spectra, Italian – Zanotta, cucina Italiana, North Indian – Diya and whisky bar- Rubicon. The "Royal Club" is located on the 6th floor of the Hotel. The Royal Club features are 24 hour butler service, with evening cocktails and a Boardroom.

The 27,000 square feet, beautifully finished convention facilities, meeting and boardrooms were recently awarded the prestigious 5-Star deluxe "Best Luxury Hotel and Conference Centre – India".

This venue has been chosen with a lot of care and thought keeping in mind the comfort and also enjoyment of the delegates when visiting Delhi.

Conference Secretariat

Indian Fertility Society

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New Delhi – 110017
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fertivision2019@gmail.com



FERTIVISION

2019

6-8 December The Leela Ambience Hotel
Gurugram, New Delhi, NCR | India

Registration Form

Title Prof/ Dr/ Mr/ Ms _____

Gender : Male Female

First Name _____ Last Name _____

Institution _____ IFS Member No. _____

Correspondence Address _____

City _____ Pin Code _____ State _____

Mobile No. _____ Email _____

(All the above fields are mandatory)

Choose from 9 Pre Conference Workshops | 6 December

Choose Any 1 Workshop

Limited Seats

1) <input type="checkbox"/> IFFS Workshop on Do's and Don'ts in Ovarian Stimulation	7) <input type="checkbox"/> Total Quality Management
2) <input type="checkbox"/> Reproductive Surgery	Pre Lunch Workshop (0900 - 1300 Hrs)
3) <input type="checkbox"/> Ultrasonography Imaging In Infertility	8 A) <input type="checkbox"/> Holistic Medicine and Patient Counselling
4) <input type="checkbox"/> Andrology & Semenology	Post Lunch Workshop (1400 - 1700 Hrs)
5) <input type="checkbox"/> Ovum Pickup and Embryo Transfer (With Simulators)	8 B) <input type="checkbox"/> Publish or Perish
6) <input type="checkbox"/> Cryobiology	9) <input type="checkbox"/> PGT and Genomics

Registration Fees

Inclusive of 18% GST

Please tick the appropriate checkbox

Category	Early Bird Fees Till 1st September 2019	Regular Fees Till 15th October	Onspot
IFS Member	INR 10500 <input type="checkbox"/>	INR 12500 <input type="checkbox"/>	INR 14500 <input type="checkbox"/>
Non IFS Member	INR 12500 <input type="checkbox"/>	INR 14500 <input type="checkbox"/>	INR 16500 <input type="checkbox"/>
Conference Registration plus Life Time IFS Membership	Embryologist INR 14500 <input type="checkbox"/>	Embryologist INR 16500 <input type="checkbox"/>	Embryologist INR 18500 <input type="checkbox"/>
	Gynaecologist INR 15500 <input type="checkbox"/>	Gynaecologist INR 17500 <input type="checkbox"/>	Gynaecologist INR 19500 <input type="checkbox"/>
PG Students (No Dinner)	INR 6000 <input type="checkbox"/>	INR 7000 <input type="checkbox"/>	INR 8000 <input type="checkbox"/>
Accompanying Person	INR 10500 <input type="checkbox"/>	INR 11500 <input type="checkbox"/>	INR 12500 <input type="checkbox"/>
Foreign Delegates	\$ 350 <input type="checkbox"/>	\$ 400 <input type="checkbox"/>	\$ 500 <input type="checkbox"/>

Inclusive of 18% GST

Conference Registration Fees Includes

Mode of Payment

- 18 Hrs of World Class Academic Program with Access to Best & Brightest International & National Faculty
- 3 Lunches and 6 Tea / Coffee Served During the Conference on 6, 7 & 8 December
- Banquet Dinner on 7 December
- Conference Kit (Including Bag, Badge, Notepad, Certificate & Pen)
- 1 Pre Conference Workshop
- Accompanying Person is Entitled for Food Coupons Only

1. Bank Draft/Cheque - To be made in favor of "INDIAN FERTILITY SOCIETY"

2. Bank Transfer Details

IFS Account Name : Indian Fertility Society
Account Number: 50562010067180
IFSC Code : ORBC0100179
Bank Name: Oriental Bank of Commerce
Branch: Connaught place, New Delhi- 110001

Cancellation Policy

- Cancellation till 31st October, 2019 – 50% Refund.
- Cancellation from 1st November, 2019 – No Refund.
- All refunds will be made after the congress.

Cheque / Draft No. _____ Total Amount _____

Note: Kindly email us bank deposit slip / UTR number once you made the payment for our record. Payment confirmation will take 7-10 working days post deposit of cheque, DD or RTGS

3. To Register online log on to www.fertivision2019.com

Congress Manager's

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

www.fertivision2019.com