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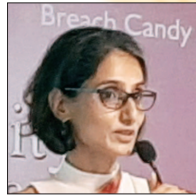
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Welcoming....

Our New Patron Members



Dr. Karishma Balani



Dr. Sukhpreet Patel



Dr. Vimee Bindra



Dr. Yashodhara Pradeep

Our New Life Members

Dr. Adarsh Bhargava
Dr. Akanshi Singh
Dr. Amitha Prithvirat
Dr. Anshumala Shukla Kulkarni
Dr. Archana Reddy Cheruku
Dr. Aruna Vanam
Dr. B. Usha Naveen
Dr. Bhawna Kamlesh Mistry

Dr. Geeta Pradeep Vaidya
Dr. Hemalekha Kumarasamy
Dr. Jasmine Kaur
Dr. Kanchan Agarwal Murarka
Dr. Mamta Laxman Shenoy
Dr. Mamta Singh
Dr. Mangala Gowri K.
Dr. Manisha Trimbak Kapadnis

Dr. Medha Anand Bhawe
Dr. Meenakshi Mehta
Dr. Padma Sajja
Dr. Pahula Bapat Verma
Dr. Rashmi Chaudhry
Dr. Rashmi Das
Dr. Sanjay Pagare
Dr. Sharanya T.

Dr. Sharda Morge
Dr. Shashikant Shamrao Bhise
Dr. Shivani Jain
Dr. Sitalakshmi A
Dr. Sudeshna Ray
Dr. Suganya P.
Dr. Sumanta Kumar Patel
Dr. Sumupriya Sugumar

Dr. Surbhi Saini
Dr. Taswin Kaur
Dr. Tauseef Nabi Khushoo
Dr. Tina Mangla
Dr. Usha Vikrant
Dr. Vaishnavi K. V.
Dr. Vani S.
Dr. Veena S. Bhat
Dr. Y. Padmalatha

Events & Updates

The Art of ART in PCOS

...a Certified Course by The PCOS Society of India

The Art of ART in PCOS



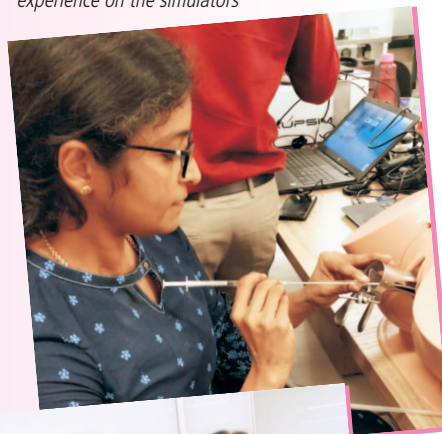
Dr. Madhuri Patil & Dr. Pratap Kumar with the Course delegates



Delegates getting hands on experience on the simulators



Dr. Madhuri Patil & Dr. Pratap Kumar with the Course delegates



Delegates receiving their course completion certificates from Dr. Duru Shah



Feedback from the delegates

"Great workshop from PCOS Society and its a wonderful academic feast for us.

Special thanks to Dr. Duru Shah Ma'am for all the efforts taken by the team to spread knowledge along with ethics among the gynaecologists."

– Dr. Hemlekha

"Thank you PCOS Society for a wonderful course."

– Dr. V. Aruna

"Great academic boost up for me."

– Dr. Tanmoy

"Thank You PCOS Society for the wonderful and practical work shop."

– Dr. Rashmi Das

Faculty

Dr. Duru Shah
Dr. Kaustubh Kulkarni
Dr. Kersi Avari
Dr. Padma Rekha Jirge
Dr. Rupin Shah
Dr. Vijay Mangoli

Dr. Hitesh Bhat
Dr. Kedar Ganla
Dr. Madhuri Patil
Dr. Pratap Kumar
Dr. Sankalp Singh

List of Delegates

Dr. Hemaleka, Madurai
Dr. Aruna V., Nizambad
Dr. Jheelam Mukherjee, Durgapur
Dr. Rashmi Das, Burla
Dr. Chandrani Saha, Agartala
Dr. Jyoti Sharma, Deharadun
Dr. Priya Mishra, Bilaspur
Dr. Nisha V. Krishnan, Mumbai

Dr. Usha Naveen B., Nizambad
Dr. Tanmoy Mondal, Midnapore
Dr. Sashikala, Asansol
Dr. Swati Jalan, Guwahati
Dr. Romy Sharma, Jammu
Dr. Gautam Vyas, Bardoli
Dr. Ranjita Malpe, Amravati

Editorial

Editorial Team



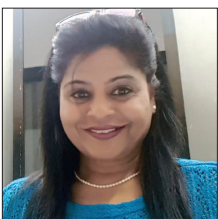
Dr. Duru Shah

MD, FRCOG, FCPS, FICS, FICOG, FICMCH, DGO, DFP
Director, Gynaecworld
The Center for Women's Fertility & Health, Mumbai
President, The PCOS Society, India
Chief Editor, Pandora



Dr. Zoish Patel

BHMS
Coordinator, Pandora



Ms. Rochelle Lobo

Administrative Assistant, Pandora

Dear Friends

As we approach the end of 2019, let's take a breath and reflect on what we have achieved during this year!

I feel proud that the PCOS Society of India was chosen as one of the collaborators for the preparation of the "**International evidence-based guidelines for the assessment and management of polycystic ovary syndrome 2018**", We were one of the 37 organizations which collaborated, which included the **American Society of Reproductive Medicine (ASRM)** and the **European Society of Human Reproductive and Embryology (ESRE)**! **The Centre for Research Excellence in Polycystic Ovary Syndrome (CREPCOS)** and **Monash University** who created these Guidelines, published them simultaneously in *Fertility Sterility* and *Human Reproduction*, in May 2018.

As the PCOS Society of India was involved in their making, it was our commitment to promote these guidelines in India. We discussed these guidelines with international experts through **12 webinars** organized throughout the year, in collaboration with the **Monash University**. I thank Helena Teede and Rob Norman for assisting me in making this a reality and to **USV Private Limited** for supporting this extremely useful educational activity.

This was truly a year of Webinars! We organized another 6 webinars on "**Advances in Infertility Management in PCOS**" in collaboration with the **Breach Candy Hospital**, These Webinars were multidisciplinary and truly appreciated for their practical discussions. I thank all our speakers, for their expertise and time, the Breach Candy Hospital for offering us their Auditorium facilities and **Torrent Pharmaceutical Private Limited** for supporting this very well received educational activity.

All the Webinars, a total of 18 episodes, are archived on the PCOS Society of India's website <https://www.pcosindia.org/> and **are available to our members free of cost**, to be viewed at their own convenience. The sessions are a fantastic source of updating our knowledge on PCOS, with an excellent feedback received from our online and offline delegates.

We held 2 **Hands-on ART Courses on "The Art of ART in PCOS"** this year, one in March and the other in September 2019. Both the 6 day Courses were fully booked, restricted to 16 delegates in each course, the intention being to be able to give full attention to them and solve all their difficulties. The feedback was outstanding and we continue to make minor changes to our next program as per the feedback received. We thank **Torrent Pharma** for supporting this much needed Course for aspiring fertility specialists.

We completed 4 "**Beat PCOS**" CMES' in the various zones of Mumbai, which were based on the "**Endocrine Aspects of PCOS**" delivered by a 4 member endocrine speaker team, to cover the endocrine aspects of PCOS for gynecologists. We thank **USV Private Limited** for supporting this activity.

Just before we ended the year, we hosted the "**International Conference on "Puberty and Adolescence in PCOS"**" in collaboration with the **International Society of Gynecological Endocrinology (ISGE)** which was held between 9th-10th November in Mumbai. A truly brilliant **ISGRE certified Masterclass** was held on the 9th of November, entirely conducted by 4 eminent international speakers, and moderated by our National Experts, bringing to the fore the latest in the field of Adolescent PCOS. This was followed by a day of highly clinical discussions on topics which I am sure were of great value for those who attended, and now will be able to manage their patients better. I thank **our colleagues from the Pharma industry** for supporting this event.

For the last 4 years we have archived a tremendous amount of educational material on our website <https://www.pcosindia.org/> which was accessible to all earlier, but from September this year we have restricted it to members of the PCOS Society. Do become our members soon and take advantage of learning more and more about a syndrome which affects almost one in 5 of your patients who come to you for their problems. The updates on the website will help you manage them and guide them better in order to prevent morbidity in their own lives and the lives of their future generation.

We have an "**Online Advanced Course on PCOS and Infertility**" entitled **EXPERT (Excellence in PCOS and Expertise in Reproductive Technologies)** which is a 6 Module Course free of cost, to all to access, with Certification offered to only Members of the PCOS Society of India.

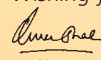
There are a few multiple choice questions and answers after completion of each Module and on scoring 80%, you can get to the next module. A Certificate will be given to those who complete all 6 modules with 80% or more marks. On receiving the Certificate, you will be eligible for the "**Online Quiz**" to be held in April 2020 and winners of the Online quiz will get an opportunity to participate in the "**Live Quiz**" during the "**Annual conference of the PCOS Society of India**" in August 2020 in Bengaluru. **The Prize winners of the Live Quiz will get outstanding awards and 100 top winners of the Online Quiz will be eligible to get 25% off on their Registration for the Annual Conference!**

We have also had the privilege over the last 2 years to be part of "**Abhiyaan PCOS – A Consortium for Healthy Womanhood**" created by a group of 4 National Organizations including the **Kasturba Health Society, Medical Research Centre, ICMR- National Institute for Research in Reproductive Health, Tata Institute of Social Sciences** and the **PCOS Society of India**, focusing on PCOS research and services. The PCOS Society of India has also been the knowledge partner to **Metropolis Healthcare Limited** to reach out to PCOS girls and women through a website "**Conquer PCOS**" www.conquerpcos.in

For the next year, our vision is to collaborate with other like minded organizations in order to widen our knowledge in the field of PCOS, to create awareness on PCOS amongst young girls so as to halt the morbidity in their future lives, and to carry out clinical research which can be easily done in our clinics by all those interested in certain areas of clinical PCOS.

After having achieved credibility and stability over the last 4 years, our mission this year is to expand our wings through the **creation of a Managing Committee** with representatives from different parts of the country, from different disciplines of medicine, and make it a stronger Organization, which will aim to nurture the health of women affected with PCOS in our country.

Wishing you all a Very Happy New Year 2020!



Duru Shah

Founder President, The PCOS Society

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www.pcosindia.org

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Webinars on "Advances in Infertility Management in PCOS"

3rd Webinar 10th July 2019

Topic: **Ovarian Reserve**

Programme

- Current evidence on Ovarian Reserve
- Panel Discussion with the Experts

- A – Dr. Duru Shah.
 B – Dr. Rana Chouhary.
 C – L to R – Dr. Purnima Nadkarni, Dr. Madhuri Patil, Dr. Duru Shah, Dr. Rana Chaudhary, Dr. Kedar Ganla, Dr. Amish Dalal, Dr. David Chandy.
 D – L to R – Dr. Purnima Nadkarni, Dr. David Chandy, Dr. Kedar Ganla, Dr. Amish Dalal.



4th Webinar 14th Aug. 2019

Topic: **Adjuvant Therapies in PCOS Infertility**

Programme

- Adjuvant Therapy in PCOS Infertility – List of Adjuvants & Rationale for Use
- Current Evidence on "Adjuvant Therapy in PCOS Infertility"
- Panel Discussion with the Experts

- A – Dr. Priti Vyas. B – Dr. Kinjal Shah.
 C – Dr. Sukhpreet Patel.
 D – L to R – Dr. Reema Shah, Dr. Kinjal Shah, Dr. Ruby Sound, Dr. Priti Vyas, Dr. Rajkumar Shah, Dr. Altamash Shaik, Dr. Duru Shah, Dr. Seema Pandey, Dr. Sukhpreet Patel, Dr. Rajesh Koradia.
 E – L to R – Dr. Ruby Sound, Dr. Rajesh Koradia, Dr. Seema Pandey, Dr. Altamash Shaik, Dr. Rajkumar Shah.

5th Webinar 11th Sept. 2019

Topic: **Male Infertility – Double Trouble!**

Programme

- Advances in the diagnosis of Male Infertility
- Panel Discussion with the Experts

- A – Dr. Sachin Dalal.
 B – L to R – Dr. Zoish Patel, Dr. Visheha Yadav, Dr. Bipin Pandit, Dr. Rupin Shah, Dr. Satish Tibrewala, Dr. Duru Shah, Dr. Vineet Malhotra, Dr. Sachin Dalal.
 C – L to R – Dr. Bipin Pandit, Dr. Rupin Shah, Dr. Satish Tibrewala, Dr. Vineet Malhotra, Dr. Sachin Dalal.



Monash Webinars on International PCOS Guidelines

These 4 Webinars were held between July 2019 to Sept. 2019

Webinar 1: August 30th Friday
 Topic: Optimising Ovulation Induction in PCOS
 Speaker: Dr. Richard Legro
 Moderator: Dr. Duru Shah

Webinar 2: August 12th Monday
 Topic: Hyperandrogenism in PCOS
 Speaker: Prof. Dr. Joop S.E. Laven
 Moderator: Dr. Duru Shah

Webinar 3: July 30th Tuesday
 Topic: What should we expect during pregnancy in PCOS? Any precautions before, during and after pregnancy?
 Speaker: Dr. Roger Hart
 Moderator: Dr. Duru Shah

Webinar 4: Sept. 26th Thursday
 Topic: Does IVF improve Fertility Outcome in PCOS?
 Speaker: Dr. Armando Hernandez-Rey
 Moderator: Dr. Duru Shah

PCOS Society of India – Monash University collaboration: A series of 12 Webinars highlighting the latest "International PCOS Guidelines" were held by the PCOS Society of India in collaboration with Monash University. Each session lasted for one and a half hour which consisted of a 30 minute talk on a subject of clinical relevance in PCOS, by an International speaker who had been involved in the making of the Guidelines. This was followed by an hour of discussion with Dr. Duru Shah. Questions from the online audience were received and replied during the discussion. If you missed out on these very informative sessions, then you can view the recordings on the PCOS Society website <http://www.pcosindia.org/recorded-presentations.php>

Health related quality of life and mental well-being among women with PCOS



Dr. Chandrika N Wijeyaratne
University of Colombo, Sri Lanka)



Dr. Achini Ranasinghe
University of Colombo, Sri Lanka)

Polycystic Ovary Syndrome (PCOS) is recognized worldwide as the commonest endocrine disorder among women of reproductive age. The increasing community prevalence noted in Asia signifies the need for due attention be paid to address PCOS in a holistic manner and as a public health priority. The constellation of clinical features in the PCOS phenotype is heterogeneous in several combinations of clinical features that includes menstrual irregularity, infertility, acne, temporal hair loss and excess body hair in the male pattern along with overweight/obesity and acanthosis nigricans. The clinical presentation often changes its degree of severity during an individual woman's life cycle. Such characteristics in the clinical profile of PCOS often leads to delay in diagnosis with confusing treatment protocols for the affected woman, further complicated by the absence of a permanent cure that can be offered.

The aetiology of PCOS is attributed to a collection of genetic factors, where lifestyle plays a central role in their expression. We reiterate that although the polycystic ovary is regarded as a diagnostic criterion, PCOS is a multifaceted clinical condition that is not confined to gynecological practice, but transcends to endocrinological, dermatological, metabolic and psychological domains. This signifies that many women are likely to face a complex pathway from the confirmation of their diagnosis to metabolic and hormonal outcomes. This is indeed portrayed by the consensus definitions that evolved over time to the current international consensus based on the Rotterdam criteria, which require the presence of any two of the following: 1) irregular ovulation or anovulation, 2) excess androgenic activity (as per clinical assessment or laboratory testing), and 3) polycystic ovaries (**Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group 2004**). The complex array of symptoms associated with PCOS along with the cluster of metabolic disorders have been shown to trigger a psychological burden that is not limited to the affected adolescent girls and women, but also among their parents and life partners.

Being a lifestyle disease, the rapid urbanization, modernization and major socio-economic changes witnessed in South Asia alongside the technological advances in diagnostics, are mirrored by a significant surge in the number of women confirmed with PCOS (**Chen et al., 2008; Kumarapeli et al., 2008**). This upward trend observed in the prevalence of PCOS is disquieting as it elevates the risk of metabolic disorders such as type-2 diabetes mellitus and cardiovascular disorders from adolescence to the post-menopausal phase. Increasing public awareness of such outcomes has potential to marginalize affected women and be made vulnerable to social stigma during their entire lifecycle. Hence, as responsible practitioners and care givers, the psycho-social impact of PCOS must be borne in mind at all times.

PCOS is a woman-centered problem since it directly interferes with the menstrual cyclicality, reproductive ability and cosmesis. Most of the South Asian cultures and communities are still 'pronatal' in nature, where fertility is considered as the synonym of womanhood. Being diagnosed with PCOS can have a hazardous impact on the affected women's mental health, irrespective of class, religion, education or economic status. As PCOS is characterized by a spectrum of symptoms with no definite cure, the bio-psycho-social perspective gives a holistic dimension to the larger issues revolving around PCOS across the life span. As a girl-child steps into her adolescent years and progresses into early adulthood, mid-life and post-menopausal years, she does not simply undergo biological changes, but also numerous psycho-social changes linked with every new aspiration. The heterogeneous nature of PCOS can interfere with her social roles (e.g. wife, mother) and transitions (marriage, pregnancy and parenthood) across the life course.

The adolescent years are unique, as it is the time of academic achievements, extra-curricular activities and peer interactions that are central in their young life. Since this is also quite often the time when PCOS begins to manifest, adolescent girls can experience an emotional turmoil if their symptoms are unrecognised and poorly managed. The psychological distress and fears they experience can directly interfere with their academic performance with long-term negative consequences. PCOS related hirsutism and obesity can lead to young girls avoiding sports and physical activities that expose their body (e.g. swimming, dancing). The embarrassment they suffer due to hirsutism, acne or obesity can make them feel unattractive, which affects their peer relationships. Their increasing need to be socially hidden or isolated, the confusion about "being not normal" due to irregular periods, the struggle with their bodies and the compulsive need to keep up with the expectations of parents on losing weight, can make them vulnerable to develop depression, social phobia, suicidal thoughts and eating disorders. In early and late adulthood years when significant life events such as finding a partner, sexual activity and marriage are the center of attention, PCOS can cause excessive emotional distress, especially where the BMI and hirsutism are alluded to in clinical discussions (**Eggers, 2001**). In addition, PCOS-related infertility and other symptoms can lead to marital conflicts, sexual problems and affect the family cohesion. Even though, the cardinal feature of PCOS disappears when a woman reaches her menopause. She remains unable to conquer the adverse effects of the disease. Co-morbidities of PCOS, such as cardiovascular disease, type 2 diabetes mellitus and endometrial cancer manifest in the perimenopause. It is evident that the heterogeneous nature of PCOS can be a hindrance to achievements of life's goals of an affected woman at every stage of her life and thus severely impact her **health-related quality of life (HRQoL)**.

HRQoL is a broad, multidimensional construct, defined as the subjective assessment of the impact of symptoms of a disease or health condition and side effects of its treatment across physical, social, and mental health domains (**Revickiet al., 2014**). Despite a wealth of research data to decipher the pathophysiology of PCOS, there is a dearth of research on psychological well-being and HRQoL of women with PCOS. Studies conducted so far on the latter in USA, UK, Canada, Germany, Iran and Australia have underlined the impact of PCOS on psychological well-being and diminished HRQoL (Jones et al., 2008). Matching data from South Asia cannot draw similar conclusions. The lack of a validated questionnaire in the vernacular for non-English speaking populations is the key reason for this. Therefore, the translation and validation of PCOS specific HRQoL questionnaires such as PCOSQ (Cronin et al., 1998) and M-PCOSQ (Barnard et al., 2007) is recommended.



PCOS is reported to have a greater negative impact on the psychological, emotional and social well-being of affected women compared to any other chronic illness such as diabetes, coronary heart disease, asthma, cancer and rheumatoid arthritis (Coffey et al., 2006; Elsenbruch et al., 2003). The diverse clinical problems of PCOS have adverse psycho-social effects across a vast arena, that includes family dynamics, professional activities, leisure activities and physical fitness (**Elsenbruch et al., 2003**). Hence, PCOS is considered a disabling condition that may significantly compromise health-related quality of life (HRQoL) and psychological well-being. (**Eggers, 2001; Elsenbruch et al., 2014; Janssen et al., 2006**).

Obesity, acne and hirsutism are found to be the major mediators for impacting on HRQoL in young women as they threaten their feminine identity. This has been exacerbated by the mass media and social media that promotes a socially constructed notion that physical attractiveness is a woman's most important asset and attractive women are more desirable, credible and inspirational.

A mainstream obsession with thinness and fair complexion can lead to poor body image and impaired self-confidence, fear of negative evaluation by others, poor social interaction and self-consciousness among affected women as they perceive that PCOS has stolen their feminine identity (**de Niet et al., 2010; Kocelak et al., 2012**). Excess body hair impacts significantly as it crosses the boundaries between femininity and masculinity.

These issues can lead to diminished HRQoL and mental health issues of women with PCOS. **A Sri Lankancohort analysis found that 32.9% women experience psychological distress and hirsutism is a significant predictor of poor quality of life (Kumarapeli et al., 2011)**.

Continued on page 10

The PCOS Society of India

In collaboration with
The International Society of
Gynecological Endocrinology (ISGE)

OPENING CEREMONY

Saturday 9th November, 2019



Duru Shah



Andrea Genazzani



Ameera Shah



Tanya Khubchandani Vatsa



Shri Sadhguru, Jaggi Vasudevji



L to R: Madhuri Patil & Andrea Genazzani



L to R: Piya Ballani, Madhuri Patil, Duru Shah, Sangeeta Agrawal, Uday Thanawala



L to R: Robert Taylor, Suganya P., Piya Ballani, Sarah Berga, Alessandro Genazzani, Uday Thanawala, Andrea Genazzani, Duru Shah, Madhuri Patil, Ameera Shah, Sangeeta Agrawal, Tanya Khubchandani Vatsa

Master of Ceremonies : Dr. Sangeeta Agrawal	
07:30 p.m.	Welcome and Greetings....
07:35 p.m.	Presidential Address....
07:40 p.m.	Presidential Address....
07:45 p.m.	"Five leadership lessons to be successful in healthcare"...
08:05 p.m.	"My personal experience with PCOS"...
08:15 p.m.	Video message....
08:25 p.m.	Vote of Thanks
08:30 p.m.	Cocktails and Dinner

ISGRE COURSE

Saturday 9th November, 2019



Charles Sultan



Andrea Genazzani



Sarah Berga



Alessandro Genazzani



L to R: Sarah Berga, Pankaj Desai, Smita Mahale



L to R: Andrea Genazzani, Usha Rama Krishna, Charles Sultan, Rishma Pai, Gauri Karandikar



L to R: Charles Sultan, Neela Baheti, Geeta Fazalbhoy, Anurag Lila



L to R: Andrea Genazzani, Alessandro Genazzani, Sarah Berga, Duru Shah, Nita Dalal, Uday Thanawala

“
Today's ISGE Master class on Puberty and Adolescence At International conference on PCOS by PCOS society was marvelous to say the least The speakers were excellent and the conduct of the conference was superb with max interaction Thank you for this opportunity.
– Dr. Shubham

“
I had the opportunity to be a part of the PCOS Society Conference on PCOS in Adolescence and Puberty. It was a great experience to meet experts across the nation and world and learn so much from them. Thanks for organising this one of a kind conference.
– Dr. Suganya P.



Our delegates

CLINICAL DILEMMAS AND EXPERT OPINIONS

Sunday 10th November, 2019



L to R: Yashodhara Pradeep, Ritu Joshi, Duru Shah, Andrea Genazzani, Padma Rekha Jirge, Swati Kanakia



L to R: Madhuri Patil, Sandhya Saharan, Sujata Kar, Charles Sultan, Padmavathy Menon, Gulrez Tyebkhan, P. C. Mahapatra



L to R: Madhuri Patil, Sarah Berga, P. Balamba, Manoj Pandya, Sarita Bhalariao, Manjiri Valsangkar



L to R: Deepak Sanghavi, Padmavathy Menon, Ganpat Sawant, Padma Ramkrishna, Piya Ballani, Ajay Kumar



“
 Thank you so much for a lovely time during the conference with well planned and presented academics.
 – Dr. Ratna Vijay

“
 Superb! A One ! Fantastic! are the words I have in my vocabulary. I am so happy I came here, have learnt so much.
 – Dr. Dipti Nabh

“
 That was a wonderful treat indeed, the conference... Came back with new ideas and thoughts. Very grateful to the organising committee for having arranged such a perfect event. And very proud to be a part of the PCOS society of India ...have joined recently. Thank you so much each and everyone of you who worked behind the scenes too.
 – Dr. Sitalakshmi

“
 It was a conference that would be remembered for long .. What an Academic feast...Khudoos to The PCOS society,
 – Dr. Ritu Petkar

“
 Thanks for a wonderful conference, great academics as always.
 – Dr. Vijaylaxmi Ganorkar Nashik

“
 Great academic feast !!! Looking forward for some more feasts. Congratulations!
 – Dr. Asha Gangane Gulbarga

“
 The conference was a focused and knowledge imparting one, thank you so much.
 – Dr. Jamunadevi, Hyderabad



L to R: Ameya Joshi, Raman K. Marwaha, Suvarna Khadikar, Ratnabali Chakravorty, Shreyas Padgaonkar, Pariskshit Tank



L to R: Suchitra Pandit, Alessandro Genazzani, Ameet Patki, Kanthi Bansal



L to R: Madhuri Patil, Sarah Berga, P. Balamba, Manoj Pandya



L to R: Andrea Genazzani, Padma Rekha Jirge, Ritu Joshi, Swati Kanakia

“
 As always excellent academics.
 – Dr. Reno Malan

“
 Thanks for the excellent academic journey of two days. Looking forward for the next.
 – Dr. Kishori Kadam & Dr. Bhawna Mistry

For detailed program and more pictures of the conference, please visit our website page <https://pcosindia.org/events.php>

Co-Morbidities in PCOS



Dr. Pankaj D. Desai

MD (O&G)

- Consultant Obgyn Specialist
Janani Maternity Hospital,
Vadodara, India
- Dean (Students), A. Professor and
Unit Chief (VR)

Introduction

PCOS is a chronic hyperandrogenic state that has many significant short-term and long-term implications for patients such as oligomenorrhea, amenorrhea, infertility, diabetes mellitus, cardiovascular disease, increased risk of endometrial cancer, and excessive body hair (hirsutism). Usually, a woman with PCOS seeks treatment for cycle control, cosmetic problems, or infertility. Nevertheless, such a visit provides the clinician with an opportunity to review the potential long-term health consequences and their preventive measures.

Diabetes Mellitus and PCOS

Insulin resistance and β -cell dysfunction are both known to precede the development of glucose intolerance and type-II DM. Consequently PCOS women would be predicted to be at an increased risk for type-II DM. The overall risk of developing type-II diabetes among women with PCOS was found to be increased 3-7 times.

Women with PCOS are at significantly increased risk **for glucose intolerance (31.1% IGT) and type-II DM (7.5% undiagnosed diabetes)** compared to concurrently studied age, weight and ethnicity-matched controls of the reproductive age. Non-obese PCOS women may also have glucose intolerance (10.3% IGT; 1.5% diabetes). Besides, these women tend to develop diabetes earlier in life, around the third or fourth decade. It is generally recommended, because of the known long-term complications of diabetes, that these young women be tested early in life and followed closely. These women should be screened in early pregnancy, as they have an increased risk of developing gestational diabetes.

Glucose testing: Glucose tolerance testing is important in PCOS. **As many as 35% to 45% of PCOS patients will have impaired glucose testing and about 7% to 10% will have type-II diabetes mellitus.** A fasting glucose to fasting insulin ratio less than 4.5 is predictive of insulin resistance. Values of the 2HR glucose tolerance test are as follows: 2H < 140 mg/dL (normal); 140-199 mg/dl (impaired glucose); and > 200 mg/dL (type-II diabetes).

Relationship of cardiovascular disease to PCOS

Women with PCOS would be expected to be at high risk for dyslipidemia due to elevated androgen levels, body fat distribution, and hyperinsulinemic insulin resistance. Several studies have shown that women with PCOS exhibit an abnormal lipoprotein profile characterized by raised concentrations of plasma triglycerides, marginally elevated low-density lipoprotein (LDL) cholesterol, and reduced high-density lipoprotein (HDL) cholesterol. Higher LDL-cholesterol, lower HDL-cholesterol, elevated triglycerides, elevated C-reactive protein level, hypertension, obesity, and insulin resistance are all known cardiovascular risk factors. **Central obesity**

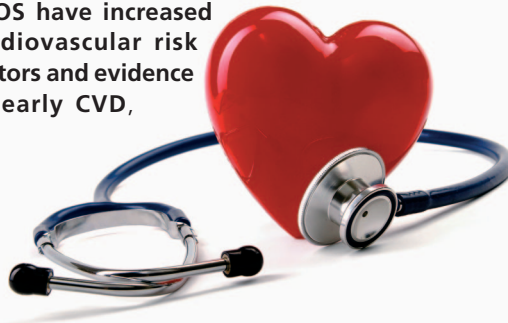
with a hip ratio of > 0.85 is associated with cardiovascular disease and is a marker for PCOS.

In addition to the lipid abnormalities seen in women with PCOS, these patients are 7 times more likely to have a myocardial infarction.

Because cardiovascular disease is the leading cause of death among women, prevention is essential.

While the association with type-II diabetes is well established, whether the incidence of cardiovascular disease is increased in women with PCOS remains unclear. Echocardiography, imaging of coronary and carotid arteries and assessments of both endothelial function and arterial stiffness have recently been employed to address this question. These studies have collectively demonstrated both structural and functional abnormalities of the cardiovascular system in PCOS. These alterations, however, appear to be related to the presence of individual cardiovascular risk factors, particularly insulin resistance, rather than to the presence of PCOS and hyperandrogenemia per se.

Overweight women with PCOS have increased cardiovascular risk factors and evidence of early CVD,



compared with weight-matched controls, potentially related to IR. Nevertheless, on examining the cardiovascular risk profiles in women with PCOS compared with healthy age and weight-matched control subjects using novel biochemical and biophysical markers, it was found that there were no differences in surrogate markers of the processes linked to enhanced cardiovascular risk between patients with PCOS and weight-matched controls.

While it is acceptable that women with PCOS have increased levels of cardiovascular risk factors: insulin resistance, obesity, dyslipidemia, hypertension and markers of abnormal vascular function, however, the level of risk for the cardiovascular disease remains uncertain.

Cardiac risk profile

It is imperative, that these patients are screened for an abnormal HDL, cholesterol, and triglycerides at 35 years of age. Normal results should be repeated in 3-5 years. Serum TG/HDL-C > 3.2 has high sensitivity and specificity for the detection of metabolic syndrome in women with PCOS. **Women with PCOS have an 11-fold increase in the prevalence of metabolic syndrome compared with age-matched controls.** The risk of metabolic syndrome is high even at a young age, highlighting the importance of early and regular screening (LEVEL OF EVIDENCE: II-2). In addition to a high TG and a low HDL-C, the atherogenic lipoprotein profile in insulin-resistant hyperinsulinemic individuals also includes the appearance of smaller and denser low-density lipoprotein particles, and the enhanced

postprandial accumulation of remnant lipoproteins; changes identified as increasing risk of CVD.

Elevated plasma concentrations of plasminogen activator inhibitor-1 (PAI-1) are associated with increased CVD, and there is evidence of a significant relationship between PAI-1 and fibrinogen levels and both insulin resistance and hyperinsulinemia. This increased activity is found to be independent of obesity.

Evidence is also accumulating that sympathetic nervous system (SNS) activity is increased in insulin-resistant, hyperinsulinemic individuals, and, along with the salt sensitivity associated with insulin resistance/hyperinsulinemia, increases the likelihood that these individuals will develop essential hypertension. The first step in the process of atherogenesis is the binding of mononuclear cells to the endothelium, and mononuclear cells isolated from insulin-resistant/hyperinsulinemic individuals adhere with greater avidity. Adhesion molecules produced by endothelial cells modulates this process and there is a significant relationship between the degree of insulin resistance and the plasma concentration of the several of these adhesion molecules.

Further evidence of the relationship between insulin resistance and endothelial dysfunction is the finding that asymmetric dimethylarginine, an endogenous inhibitor of the enzyme nitric oxide synthase, is increased in insulin-resistant/hyperinsulinemic individuals.

Finally, plasma concentrations of several inflammatory markers are elevated in insulin-resistant subjects. For instance, it has been demonstrated that PCOS women have an increased WBC count. C-Reactive protein (CRP) has been implicated as a vascular disease risk factor. Although CRP was found to be significantly higher in PCOS patients than in controls, PCOS associated with IMT (Intima Media Thickness) independently of CRP and PCOS remained associated with IMT independent of insulin or visceral fat. Thus, it appears that CRP does not appreciably mediate the effect of PCOS on IMT.

Obesity partially explained the influence of PCOS and CRP on IMT.

It is obvious that the cluster of abnormalities associated with insulin resistance and compensatory hyperinsulinemia contains many well-recognized CVD risk factors, choosing which one, or ones, that are primarily responsible for the accelerated atherogenesis that characterizes PCOS is not a simple task.

Endothelial Dysfunction, Obesity and Adipose Hormones

In recent years, it has been shown that adipocytes are secretory cells that produce a variety of proteins with hormonal-type functions, which collectively have been called adipocytokines. **The first adipose hormone discovered was leptin** a protein which acts mostly as a signaling factor from adipose tissue to the central nervous system, thus regulating food intake and energy expenditure, its circulating levels are strictly correlated to adipose mass and are higher in obese humans.

Adiponectin is produced exclusively by adipose cells and may have a role in preventing or counteracting the development of insulin resistance. In contrast to leptin, the production of adiponectin is decreased in obese subjects. Finally, a third protein produced by adipocytes, resistin, was synthesized and was thought to be related to the development of insulin resistance. It has been reported that circulating levels of resistin are increased in obesity.

It has been reported that leptin is mostly produced by subcutaneous adipose tissue. Adiponectin was believed to correlate with visceral fat production but not with subcutaneous fat. This has been recently challenged and is found that reduction in both distribution of fat reduces adiponectin. In PCOS, leptin levels were similar to those of matched controls and in general were strongly correlated with body weight (expressed as BMI) and less well with insulin and insulin sensitivity (expressed as QUICKI). There was little difference between controls and women with PCOS and the correlations of leptin with insulin and insulin resistance were strictly dependent on changes in body weight. Adiponectin was clearly lower in PCOS. For the entire group, resistin levels were also higher in PCOS, although this difference was less obvious with BMI stratification. A decrease of adiponectin and an increase of resistin have been linked to the development of insulin resistance.

While in normal women both adiponectin and resistin, although in opposite ways, correlated with insulin and QUICKI, these correlations were not found in PCOS. It has been suggested that differences in adipose tissue distribution may influence the secretion of the different adipocytokines. Therefore, women with PCOS who are having a normal weight may have, in reality, an increase in total visceral adipose tissue that may contribute to the development of cardiovascular risk in these patients.

A study was designed to determine if abnormal carotid IMT and brachial flow-mediated dilation (FMD) in young women with PCOS may be explained by insulin resistance and elevated adipocytokines. These data suggest that young women with PCOS have evidence for altered endothelial function. Adverse endothelial parameters were correlated with insulin resistance and lower adiponectin. Both insulin resistance and adiponectin appeared to be important parameters.

Cardiovascular Risks in PCOS in Young Adults Polycystic ovary syndrome (PCOS) is associated with premature carotid atherosclerosis. PCOS affects femoral and carotid wall mechanics leading to premature sub-clinical atherosclerosis in young women with PCOS. Adolescence may be a more appropriate time to intervene for PCOS patients, as many cardiovascular risks are already present during early adulthood. Significant vascular abnormalities range from endothelial dysfunction and low-grade or sub-clinical inflammation to evident atherosclerosis.

Among many cardiovascular risk factors evaluated, the diagnosis of PCOS, increased body mass index and decreased sex hormone-binding globulin were significant independent predictors of increased IMT. PCOS women had higher left atrium size and left



ventricular mass index, lower left ventricular ejection fraction and early to late mitral flow velocity ratio than controls. The differences between PCOS women and controls were maintained in overweight and obese women. In normal-weight PCOS women also, a significant increase in the left ventricular mass index and a decrease in the diastolic filling were observed. **This shows that PCOS can have a detrimental effect on the cardiovascular system even in young women asymptomatic for cardiac disease.**

Middle-aged women with PCOS are at increased risk of the metabolic cardiovascular syndrome and have been demonstrated to increase the incidence of coronary artery calcification and aortic calcification as compared with controls. Components of metabolic cardiovascular syndrome mediates the association between PCOS and coronary artery calcification, independently of obesity.

PCOS and Hypertension

Although a positive relationship between insulin and blood pressure has been demonstrated in many populations, it is possible that this association does not exist in PCOS. Women with PCOS do not appear to be hypertensive compared to control subjects matched for body composition, even if they have significant insulin resistance.

One study confirmed the advantages and the importance of 24-hour monitoring as a diagnostic and predictive method for assessment of blood pressure alterations even in the absence of overt hypertension. **PCOS is characterized by a higher incidence of unstable blood pressure that is an additional risk factor for further development of cardiovascular diseases in this relatively young age group.**

PCOS and Fibrocystic Breast Disease

Two studies show paradoxical results as regards the association between the fibrocystic disease of the breast and PCOS. While one shows that there is a positive correlation between PCOS and occurrence of fibrocystic disease of the breast, another study shows that there is a protective effect of PCOS. As a result in clinical practice, it will be best to wait for further studies to get a clear picture.

PCOS and Endometrial cancer

While the majority of women with endometrial cancer are postmenopausal, when endometrial carcinoma does develop before age 40, it is usually foreshadowed by chronic obesity and/ or anovulation. The chronic anovulatory or oligo-ovulatory state of PCOS is characterized by high estrogen (and insulin) but little or no progesterone activity, with resultant endometrial hyperplasia.

Tonically elevated insulin up-regulates estrogen-producing aromatase enzyme systems in both, endometrial glands as well as in the stroma 51. This yields additive and deleterious results for the woman who is both hyperinsulinemic and anovulatory. **Once present, endometrial hyperplasia advances to frank endometrial carcinoma in as many as 30% of cases.** Indeed, endometrial cancer cell lines demonstrate an accelerated growth rate in the presence of insulin.

PCOS and other Gynecological Malignancies

Ovarian cancer risk was found to increase 2.5-fold among women with PCOS. This association is found to be stronger among women who never used oral contraceptives. The data suggest that the hormonal status of women with PCOS featuring abnormal patterns of gonadotropin secretion (enhanced levels of LH) in lean women may be a mitigating factor for the observed association between PCOS and ovarian cancer. Although the proportion of women with a positive family history of breast cancer was significantly greater in women with PCOS compared with controls. The risk of breast cancer risk is not clearly increased with PCOS.

Conclusion

The fundamental flaw in PCOS remains unknown and is an area of perpetual continuing study. There is now a reasonable agreement to the fact that the key features in PCOS include insulin resistance, androgen excess, and abnormal gonadotropin dynamics. There are clear associations between PCOS and endometrial cancer, obesity, cardiovascular disease and diabetes mellitus with both short and long term consequences. Although the adversative health effects associated with PCOS are considerable, most women are not aware of these risks. Lifestyle modifications, mainly a balanced diet, and regular exercise are critical in altering the effects of PCOS including the comorbidities associated with it.

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Health related quality of life and mental well-being among women with PCOS

Infertility can be devastating to a woman who is already suffering from PCOS related stressors, if she lives in a society where tremendous importance is being placed on marriage and childbearing. In patriarchal societies, childbearing is considered as the sole responsibility of the woman and her inability to achieve this societal norm is linked to social exclusion, inauspiciousness, ill-treatment within the household, marital abandonment and deep emotional distress. Unfortunately, these women get subjected to secondary victimization as society tends to adopt a more sympathetic attitude towards the male partner while the woman has to carry the blame for the couple's childlessness. These issues pave the way to diminished psychological well-being and HQoL of these women. The psycho-social stress associated with the state of being infertile, can augment infertility by an adverse effect on ovulatory functions and increasing disturbances in reproductive hormones that will enhance the risk of treatment failure (Eggers et al., 2001). Adolescent girls too can experience poor HRQoL as a result of the frustration they experience when they do not menstruate every month as their healthy peers do, along with the lack of understanding about PCOS (Lee et al., 205; Trent et al., 2003).

The multitude of intense stressors (cognitive, psychological or social) experienced by women with PCOS place them at a higher risk of developing psychiatric disorders if they are already carrying a genetic vulnerability that accounts for biochemical imbalances in the brain. In addition, most of the mental illnesses mark their onset during adolescence and young adulthood. As PCOS begins to appear and is diagnosed at the same age, the enormous psycho-social stress related to the illness can be also identified as a significant determinant that can aggravate psychological disturbances if there is an inborn genetic vulnerability (Sundararaman et al., 2008). Depression and anxiety are the most commonly reported psychiatric disorders associated with PCOS (Trent et al., 2002; Himelein et al., 2006; Barnard et al., 2007; Tan et al., 2008). Current clinical practice that has a multitude of medications for psychological problems often overlooks the possibility of medication induced impact on obesity and the metabolic syndrome. Hence, pharmacotherapy in this field needs careful consideration with inter-disciplinary discussion.

In summary, clinical manifestation of PCOS and its future metabolic risks could plausibly aggravate the risk of mental illness, especially mood disorders (Sundararaman et al., 2008). This can further worsen the psychological well-being and HRQoL of affected women as, there are many social and economic repercussions such as increased health care cost, impaired academic or occupational achievements and suicidal ideation associated with psychiatric morbidities.

Embarrassment is a recurring theme for many women with PCOS from South Asia. Despite living in a country with universal health coverage, only 55% sought treatment for PCOS, that suggests a 'culture of silence' around the young South Asian woman with PCOS (Kumarapeli et al 2011). This may hold true for many other countries in the region. Such health seeking behaviour may be explained by their perception of failing to conform to societal expectations of femininity and womanhood, belief on being stigmatized and the lack of knowledge about PCOS. In addition, in the South Asian context women are often discouraged to make decisions and become independent. It is the father and then the husband or the mother-in-law who makes decisions and this can be a major barrier to seeking treatment as these adolescent girls and young women would find it humiliating to openly discuss their personal issues with the immediate family. This social structure prevents timely diagnosis and leads to worsened HRQoL that may be more often overlooked. It is vital that these issues are addressed and psychological

interventions be prioritized and coordinated in the holistic management of PCOS.

Peer support groups have been identified as one of the most suitable forms of intervention in improving HRQoL as it provides a supportive and compassionate platform where women and adolescent girls with PCOS have the opportunity to meet others facing similar challenges and receive emotional support from one another without much exposure. The perception of a woman living with PCOS is a 'normal women' is severely challenged when they live in world of silence, while such a program will afford them a sense of belonging. Women in the West who have participated in online peer support groups have reported many outcomes related to self-empowerment such as empathy, gaining emotional support by sharing of experiences, experiencing a sense of fulfillment through helping others, an excellent rapport with their physician, positive involvement in treatment-related decision making accurate illness perception and improved quality of life (Holbery et al., 2013; Eggers et al., 2001).

Meanwhile, depression has been recognized as one of the major contributing factor for diminished HRQoL, which in turn drastically decrease their motivational level. As an adequate level of motivation is vital for maintaining a regular compliance with diet, exercise and medication, it is important that psychological interventions are implemented to alleviate depression. **Cognitive Behavioural Therapy (CBT)** is an evidence-based intervention that is salient in the management of depression and psychological distress associated with PCOS (Barnard et al., 2007; Sundararaman et al., 2008). Scheduling behaviourally activating events, resetting life goals for exercise and nutrition, teaching coping skills, problem solving skills and relaxation techniques in parallel with identifying and modifying the dysfunctional thoughts linked with poor body image and self-confidence can help in mitigating psychological distress and improving HRQoL. It is also recommended that immediate family members of the affected women also be educated about PCOS and its repercussions. Educational materials written in native languages should be freely available in both health and community setting.

The authors wish to caution and highlight the need to be conscious of the psychological impact of PCOS when conducting public health programs in the community. All efforts should be taken not to portray PCOS as a major disability. In the South Asian countries in which arranged marriage systems and sub-class systems that share similar roots and values are yet prevailing, the purpose of the marriage is viewed as reproduction and not conjugal intimacy and companionship. Marriage and motherhood are considered as the definition of womanhood and mandatory life stages. Therefore, such programs should not lead to a societal 'labeling' of girls and young women as having PCOS, which can have negative consequences for her marriageability as the society may doubt these girls' ability to conform to culturally defined notions of womanhood.

Hence, all psychological interventions should be tailored according to the cultural needs, individual perceptions of symptoms and personal priorities in order to yield a maximum positive outcome where the affected girls and women are ensured a life with dignity. Effective communication between patients and their health care practitioners is crucial for many reasons. Seeking unsolicited health advice from family, friends, acquaintances and alternative medicine practitioners can further pose challenges to HRQoL. The best example is that most of the parents believe that if the adolescent girls are taking contraceptive pill, it is an indirect way of giving them permission for sexual behavior. There are an umpteen number of young women who perceive that contraceptives lead to "artificial" periods and "fake"

femininity. Therefore, a positive relationship with a multidisciplinary team of professionals (e.g. gynecologists, endocrinologists, psychologists, nutritionists, yoga and physical exercise therapists) will aid medication adherence, create an avenue to receive accurate health information and will ultimately lead to better PCOS outcomes and improved HRQL. Similarly, health care professionals partnering with women with PCOS should ensure that these women are screened for mental health issues such as anxiety, depression, psycho-sexual function and suicidal ideation at regular intervals. Nevertheless, maximum care should be taken to avoid over diagnosis and further stigmatization of the affected woman and psychological referrals should be done appropriately.

As there is no known permanent cure for PCOS, adopting an approach that addresses preventive and palliative lifestyle management is vital in upholding the HRQoL and psychological well-being among women with PCOS.

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