The Mumbai Obstetric & Gynecological Society

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» MOGS NEWS HEADLINES

'एमओजीएस'ची ५१ वी वार्षिक परिषद उत्साहात

जगभरातून ८५० हून अधिक प्रतिनिधी सहभागी

मुंबई, नवराष्ट्र न्यूज नेटवर्क. मुंबई ऑब्स्टेट्रिक अँड गायनॅकॉलॉजिकल सोसायटीतर्फे ५१ वी वार्षिक परिषद आयोजित केली होती. 'गायनॅकॉलॉजी अँड ऑब्स्टेट्रिक लर्निंग डायलेम्मा या विषयाशी संबंधित असलेली ही परिषद एमओजीएसचे अध्यक्ष डॉ. निरंजन चव्हाण यांच्या नेतृत्व आणि मार्गदर्शनाखाली झाली. गायनॅकॉलॉजिक सर्जरी, ईमर्जन्सी व ऑपरेटिव्ह ऑब्स्टेट्रिक आणि मॉर्डन टेक्नॉलॉजी इन फर्टिलिटी कंट्रोल अशा विविध विषयांवर या परिषदेत चर्चा करण्यात आली. या परिषदेत जगभरातून ८५० हून अधिक प्रतिनिधी सहभागी झाले होते. प्रमुख पाहुणे म्हणून एमओजीएसचे अध्यक्ष डॉ. हृषिकेश पै, चित्रपट अभिनेत्री वर्षा उसगावकर यांच्या हस्ते उद्घाटन झाले. पारितोषिक वितरण आणि 'व्हिजन फॉर हर' पुरस्कारप्राप्त डॉ. नलिनी एन. चव्हाण यांचा परिचय करून देण्यात आला. या परिषदेत २१ पेक्षा जास्त प्रमुख वक्ते, ५ वक्ते, १२ पॅनल चर्चा आणि तीन वादविवादांसह आंतरराष्ट्रीय आणि राष्ट्रीय वक्त्यांच्या सहभागासह कनिष्ठ आणि वरिष्ठ स्त्रीरोग तज्ज्ञांनी १५२ पेपरचे वाचन केले. गायनॅऑन्कोलॉजीमध्ये नवीन काय आहे? यावर डॉ. निरंजन चव्हाण यांचे एमओजीएस अध्यक्षीय ओरेशन होते. डॉ. हृषिकेश पै यांचे आर्टीफिशियल रिप्रोडक्टिव्ह टेक्नॉलॉजीमध्ये नवीन काय? या विषयावर डॉ. एम. डी. अडातिया ओरेशन होते. फ्रँकफर्ट जर्मनीतील डॉ. फ्रँक लोवेन यांचे टीचिंग द ब्रीच अँड इट्स सेफ्टी फीचर्स या विषयावर डॉ. उषा कृष्णा ओरेशन होते, डॉ. प्रताप कुमार यांचे स्कार्ड युटेरस या विषयावर डॉ. सुभाष जे पेनकर आणि डॉ. मेरी परेरा ओरेशन होते.

> ही वार्षिक परिषद अभूतपूर्व यशस्वी ठरली. यामध्ये जगभरातील सुमारे ८५० प्रतिनिधी आणि प्राध्यापक सदस्यांनी सहभाग घेतला. प्राध्यापक आणि प्रतिनिधींचा उत्साह संसर्गजन्य आणि जबरदस्त होता.
> - **डॉ. निरंजन चव्हाण,** अध्यक्ष, मुंबई प्रसूती आणि स्त्रीरोग सोसायटी

तज्ज्ञांचे मार्गदर्शन

परिषदेत सुप्रसिद्ध आणि वरिष्ठ स्त्रीरोग तज्ज्ञ आणि सर्जन डॉ. शिरीष शेठ, डॉ. दीपक दवे, डॉ. उषा कृष्णा, डॉ. उषा सरैया, आयव्हीएफ सल्लागार डॉ. इंदिरा हिंदुजा आणि डॉ. फिरोजा पारीख, एमओजीएसचे माजी अध्यक्ष डॉ. सी. एन. पुरंदरे, प्रख्यात अल्ट्रासाऊंडचे शिक्षक ज्येष्ठ डॉ. पी. के. शाह, इंटर्नल इलियाक सर्जन डॉ. राजेंद्र सरोगी, मुंबईतील ए. ए. स्टिच तज्ज्ञ डॉ. अशोक आनंद आदी सहभागी झाले होते.

Dr. Niranjan Chavan
PRESIDENT

Dr. Rajendra Sankpal
SECRETARY

Dr. Geetha Balsarkar
TREASURER

We request our esteemed readers to send their valued feedback, suggestions & views at **mogs2012@gmail.com**

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From the Desk of President

Dr. Niranjan Chavan

MD, FCPS, DGO, DFP, DICOG, MICOG, FICOG,

Diploma in Endoscopy (USA), Training In Minimal Access Surgery. (Hampstead, U.K)

Dear MOGS members,

It gives me great pleasure to present to you all MOGS Newsletter BUZZ & BYTES, April 2023 issue as President of MOGS and Editor-in-Chief of this newsletter. Editors – Dr. Ameya Purandare, Dr. Punit Bhojani and Co-editors – Dr. Riddhi Desai and Dr. Zubin Sheriar have curated a fascinating newsletter for you all. We present to you interesting scientific content with articles by stallworths in the field of Obstetrics and Gynaecology.

The last quarter of the year was an academic treat with multiple Outreach CMEs on Recent advances in Infertility and Key advances in the field. World Cancer Day was marked with an exceptional CME in association with SAFOG. The 51st Annual MOGS GOLDs Conference held on 11th and 12th February 2023 at J W Marriott which was attended by more than 850 delegates. 152 papers were read by junior and senior gynecologists with the participation of International & National speakers with more than 21 keynote speakers, 5 orations, 12 panel discussions, and 3 debates. We also got to see the fun side to our managing and youth council as they put on a thrilling Bollywood themed fashion show in front of a roaring audience. The Dr. Nandita Palshetkar Postgraduate CME attended by 450 students was held in 2 phases and showcased the progress of exam going PG students while refining them for their exams. We bring to you glimpses of the several Outreach CMEs held from January 2023 to March 2023; they are a visual delight. I would like to thank the Editors, Co-Editors, Dr. Shruti Rane and Dr. Zeba Pathan from Dr. NNC Unit Sion Hospital. After a stellar 2022, we look forward to an exciting 2023! Hope you all enjoy the Fun and learning, Sudoku and Crossword provided for your entertainment.

With warm personal regards,

Dr. Niranjan Chavan
President, MOGS

From the Desk of Secretary

Dr. Rajendra Sankpal

Dear Friends & Colleagues,

We are extremely pleased to present to you the MOGS Newsletter BUZZ & BYTES, April 2023 issue. This newsletter includes all the exciting events that were conducted by MOGS, almost every single weekend like the MOGS outreach program, Dr. Nandita Palshetkar PG CME. It also showcases MOGS celebration of the International Women's Day. I hope, like me, you too are excited to see all photographs of each and every event! If that's not enough, there are enthralling articles on some of our favorite topics ranging from Poor Ovarian Reserve to Vaccination in Pregnancy and for those looking to rack their brains with some teasers, there is Quiz, Sudoku and Word Puzzle. Do enjoy pictures of all conferences and events to relive all the fun that we all had in the past few months. Editors Dr. Ameya Purandare, Dr. Punit Bhojani and Co-editors Dr. Riddhi Desai and Dr. Zubin Sheriar have compiled this wonderful newsletter for MOGS with great detail.

With warm personal regards,

R. Sankpal

Dr. Rajendra Sankpal
Secretary MOGS

VISION FOR HER NC
HEAL EDUCATE RESPECT

From the Desk of Editors

EDITORS

Dr. Ameya Purandare

Dr. Punit Bhojani

CO-EDITORS

Dr. Zubin Sheriar

Dr. Riddhi Desai

Dear friends,

As we look back on the past year at MOGS, we are filled with a sense of pride and accomplishment. It has been an academically enriching and fulfilling year, marked by our efforts to reach out to the grassroots and collaborate internationally. A heartfelt gratitude to all our MOGS members, for their active participation and valuable contributions and for making this a truly successful year! We are thrilled to present the final edition of the MOGS Newsletter, Buzz and Bytes, under the able guidance of our esteemed President Dr Niranjan Chavan, Secretary Dr Rajendra Sankpal, and Treasurer Dr Geetha Balsarkar. This issue showcases the events from Feb-Apr 2023, including MOGS Outreach CMEs, special events on World Cancer Day, International Women's Day, MOGS Dr Nandita Palshetkar Postgraduate CME and the landmark 51st MOGS Annual GOLDs Conference. This issue also features a collection of insightful scientific articles from experts and some stress-busting word puzzles, Sudoku and learn with fun segments.

We acknowledge and thank the entire team of Buzz and Bytes, who have worked tirelessly behind the scenes to bring to you the choicest articles and meticulous compilation of all the events. We would also like to express our gratitude to President Dr Niranjan Chavan for providing us with this opportunity and congratulate the Office Bearers for a fabulous year. Hope you all like this issue as much as we liked putting it together for you!

Happy reading!

Dr. Ameya Purandare Dr. Punit Bhojani

Editors

Dr. Zubin Sheriar Dr. Riddhi Desai

Co-Editors

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Poor Ovarian Response - A Nightmare for Infertility Specialists

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Infertility Specialist, Gynecologist & Obstetrician

INTRODUCTION

Ovarian reserve refers to size and quality of available ovarian follicular pool and the ability of the ovaries to respond to exogenous gonadotropin stimulation. Ovarian reserve testing is done with intentions to predict fecundity and to gain prognostic information regarding the likelihood of successful response to ovarian stimulation in couples opting ART procedure. Poor ovarian reserve (POR) indicates a reduction in the quantity of ovarian follicular pool in women of reproductive age group However, the incidence may be much higher in the infertile population as many may never undergo a complete evaluation or IVF.

Diminished ovarian reserve is a phenomenon often noted in women in their mid to late thirties, but it may affect younger women as well. It is believed that there is an accelerated decline in follicular pool at the age of 37–38 when it reaches below a critical of 25,000.[1] as a result there is a very limited time for conception with one's own eggs.

Existence of POR has been unmasked due to an increasing acceptance of in vitro fertilization (IVF) as a modality of treatment for infertility. It is estimated that approximately 10% of the women undergoing ART procedures will show poor response to gonadotropin stimulation.[2-4]

Poor ovarian reserve may be due to declining quality due to aging oocytes, and hence, young women with POR may have better chance at conception. [5,6] However, recent evidence challenges this and POR may be associated with low pregnancy rates irrespective of age [7, 26] and a high pregnancy loss.[27,28]

Identifying the " poor responder " can be a difficult challenge before the treatment for the infertile patient. It is important in the evaluation of infertile couple to screen for their ovarian reserve and determine the risk for a poor response to controlled ovarian hypertimulation [COH]. This review was done with an aim to diagnose and manage POR and its implications on fertility and long-term health of such women. Literature was searched using the keywords "ovarian reserve", "'poor ovarian reserve" and "diminished ovarian reserve". Around 500 articles were reviewed and signicant conclusions were withdrawn. Appropriate cross-references were manually searched.

DIAGNOSIS

Failure to respond adequately to standard protocols and inadequate recruitment of follicles is termed as" poor response" and leads to decreased production of oocytes and cycle cancellation. Identifying POR, whether age-related or otherwise becomes important as these women have a lower pregnancy rate and higher pregnancy loss compared to age-matched controls with normal ovarian reserve.[28] Shortening of the menstrual cycles due to early follicle development and ovulation is an indicator of POR.[29] but this variable symptom cannot be utilized as a diagnostic criteria of POR. Various ovarian reserve tests (ORTs) have been in use to assess ovarian reserve and predict response to

ovarian stimulation.[30,31] like basal FSH, basal estradiol, antimullerian hormone[AMH], inhibin B, antral follicle count , ovarian volume, ovarian vascular flow as assessed by Doppler flow, ovarian biopsy.

Increasing age is associated with a declining oocyte yield in IVF and reduced pregnancy and live birth rate.[32, 33] However, POR may occur in young women; hence, other markers of ovarian reserve are needed to identify such women who would otherwise be labeled as having unexplained infertility).Ovarian reserve tests [ORTs] provide an indirect measure of a woman's remaiming follicular pool. One of the earliest ORTs found to be associated with poor response is Elevated basal follicle-stimulating hormone (FSH) However, a normal FSH can not exclude poor response and elevation may happen relatively late in the course of declining ovarian reserve. Hence, basal FSH is not an ideal test to identify poor responders.[33] Antral follicle count (AFC) and anti-Mullerian hormone (AMH) are the most sensitive markers of ovarian reserve identified to date and are ideal for planning personalized ovarian stimulation protocols. These sensitive markers permit prediction of the whole spectrum of ovarian response with reliable accuracy, and clinicians may use either of the two markers as they can be considered interchangeable.[34]

Majority of the attempts at definition of POR have considered certain parameters noted during ovarian stimulation for IVF: Either a low peak estradiol concentration following conventional ovarian stimulation (300–500 pg/ml)[3,4,35] or a low number of follicles (≤five follicles) and/or eggs (≤five eggs).[35, 36] Some definitions consider the age of ≥40 years, an abnormal value of ORT, or previous poor response for diagnosing POR.[37-39] it can be concluded that it is a retrospective diagnosis following at least one cycle of IVF with conventional stimulation. A review in 1999 had already documented 35 definitions of POR.[40]

Lack of homogeneity in the definition of poor responders makes it difficult to evaluate the effectiveness of proposed interventions therefore to reduce the heterogeneity in the definition of poor responders Bologna criteria have been introduced following the consensus meeting of "ESHRE working group on POR definition" held in 2011.[41]

Bologna criteria recommend the presence of at least two of the following three features for diagnosis of POR:

i. Advanced maternal age (≥40 years) or any other risk factor for POR
ii. A previous POR (cancelled cycles or ≤three oocytes with a conventional stimulation protocol)
iii. An abnormal ORT (i.e. AFC less than 5–7 follicles or AMH less than0.5–1.1 ng/ml).

Two episodes of POR after maximal stimulation are sufficient to define a patient as poor responder in the absence of advanced maternal age or abnormal ORT. Women more than 40 years of age with an abnormal ORT may be classified as "expected poor responders" since both advanced age and an abnormal ORT may indicate reduced ovarian reserve and act as a surrogate of ovarian stimulation cycle.[41]

Bologna criteria have been criticized mainly because of the diversity of the risk factors included such as pelvic infection, endometrioma, ovarian surgery, and extensive periovarian adhesions as the impact of each of these factors on ovarian reserve is highly variable. However, ESHRE consensus is acknowledged as the most important step toward a uniform definition of POR and that these criteria be used in any future randomized controlled trial involving intervention strategies for POR.[42,43]

The POSEIDON (which stands for Patient-Oriented Strategy Encompassing Individualized Oocyte Number) classification has been introduced to classify women with a low chance of success IVF into four groups based on age, egg count and response in the previous IVF treatment cycle.

Treatment options, such as an increase in dose of injectable fertility drugs (the gonadotrophins LH and FSH), additional injections of drugs such as recombinant LH (an injectable fertility drug) and egg pooling have been advocated. Most of these proposed treatment options need further research to prove or disapprove their apparent beneficial effect. Some of these suggested strategies are not patient-friendly and, in addition, raise the treatment cost.

Group 1- age < 35 yrs, AFC ≥ 5, AMH ≥ 1.2ng/ml

Group 2- age ≥ 35 yrs, AFC ≥ 5, AMH ≥ 1.2ng/ml

Group 3- age < 35 yrs, AFC < 5, AMH < 1.2ng/ml

Group 4- age ≥ 35 yrs, AFC < 5, AMH < 1.2ng/ml

The proposed treatment options in groups 1 and 2 include increasing the starting dose of gonadotrophin and/or the addition of recombinant LH as well as the use of dual stimulation (duostim) to increase the oocyte yield (Sunkara et al., 2020). For POSEIDON groups 3 and 4, additional options of adding adjuvants and the use of dual triggers have been suggested (Haahr et al., 2019; Polyzos and Drakopoulos, 2019).

MECHANISM AND ETIOLOGY OF POOR OVARIAN RESERVE

Reproductive aging is a continuous process from before birth till menopause.[44] . In females, the number of oocytes peaks around 20th week of gestation when approximately 6-7 million oocytes arrested at the first meiotic prophase are found in the ovarian cortex. Afterward, regulated apoptosis starts an irreversible decline in the population of germ cells. At the time of birth number of oocytes are 1-2 millions and at puberty around 3 to 4 lakhs. over the next 35 -40 yrs of reproductive life, only about 400 oocytes ovulate and the rest undergo atresia.

Accurate modeling of pattern of follicle depletion in human ovary is important because the ability to measure reproductive aging or to predict the number of remaining follicles to tell time on the biological clock would help clinician to take decision regarding individualized ART procedure.

A mathematical model proposes that women experience a biphasic exponential decline in ovarian follicles - a slow decay from birth till 38 years of age with an accelerated decline thereafter.[4] Recent evidence challenges this view and suggests that the decline is due to a progressively increasing rate of atresia throughout the reproductive period.[44] This power model also highlights the difference in the size of the nongrowing follicular (NGF) pool between women. Even among those with "normal ovarian reserve" of the same age, the difference in the size of the follicular pool can be as high as 100-fold. However, it is unclear at present whether this is due a difference in the size of the initial follicular pool or due to differences in the rate of depletion.

Follicular atresia has important clinical implications for ovarian stimulation as the magnitude of recruited of follicles is proportional to the size of the NGFs. In addition, women of all age groups with NGFs below the normal range would have a suboptimal response to ovarian stimulation and experience a shortened reproductive lifespan. Considering a fixed time interval between end of fertility and menopause, these women would undergo an early menopause.[46]

Other than aging several other factors may further deplete the ovarian reserve during reproductive years such as Endometrioma, certain pelvic inflammatory diseases, genital tuberculosis, ovarian surgery, uterine artery embolization for treatment of fibroids etc. Chlamydial infection adversely affects the ovarian response in those undergoing IVF.[3] Such etiological factors are believed to induce impairment of intrafollicular endocrine and other regulatory mechanisms, reduced aromatase activity, reduced biological activity of gonadotropin surge-attenuating factor, and altered blood flow. [47-50]

Endometrioma and its surgical excision is known to cause POR.[51] Mechanical pressure on ovarian cortex, impaired vascular networks, and alteration of cortical stroma are some of the mechanisms attributed to the damage caused to ovarian follicles. [52]

These women show signs of poor response, requiring high doses of gonadotropins for ovarian stimulation, and reduced oocyte yield during IVF. [54]

Chemotherapy and radiotherapy in various malignancies are known to affect the ovarian reserve adversely.[56-58] Obesity and chronic smoking are other factors known to be associated with POR. [59,60]

Ethnicity also is known to affect OR as determined by ovarian reserve markers. In a study of Indian women undergoing IVF, ovarian age of Indian women was found to be approximately 6 years older than their Spanish counterparts.[61] In comparison to White European women, those from India, Southeast Asia, Middle-East, and Afro-Caribbean undergoing IVF in the UK showed a lower live birth rate indicating a possible causative role of ethnicity.[62] Another study examining the ovarian reserve markers in women among different ethnicities found that Chinese, Latina, and African women had a lower ovarian reserve compared to Caucasian women of similar age.[63] However, a study evaluating the disparities in ovarian reserve between different ethnicities showed that Bangladeshi women who migrated to UK as adults or living in Bangladesh had lower ovarian reserve compared to those who migrated in childhood or European women. The role of ethnicity may not be a simple one and early developmental factors may need to be taken into consideration while evaluating inter-group variations.[64]

Altered expression of certain genes in cumulus and granulosa cells have been implicated in the etiology of POR in young women.[65,66] FSH receptor (FSHR) polymorphism is considered to be an important cause of unexpected poor response in young women undergoing IVF. Mutations, polymorphisms, and alternatively spliced variants in FSHR have varied effects on receptor function. They are believed to bring about structural change in the receptor, thereby reducing the hormone-binding ability or hormone-induced signaling ability.[67] Certain types of mutations in FMR1 gene are known to be associated with reduced ovarian functional reserve in young women.[68]

MANAGEMENT

Women with POR have a limited reproductive lifespan and the main concern is to conceive with their own eggs. The vast majority of available evidence on efficacy of various therapeutic interventions in women with POR is in the context of IVF and shows a lowered pregnancy and live birth rate irrespective of age.[7,8,26,69]. Treatment of patients aims at Avoiding profound and prolonged pituitary suppression, prevention of premature luteinizing hormone (LH) surge, and controlled ovarian stimulation (COS) to maximize oocyte yield and get good qualities of embryo. A common hurdle for comparison of treatment strategies has been the different criteria used by investigators to define POR, though the Bologna criteria offers the right direction to identify homogenous groups for evaluating efficacy of various therapies.[70-72]

Controlled ovarian stimulation for in vitro fertilization-

Most widely used ovarian COS protocols in poor responders involve stimulation with high doses of FSH (300–450 IU/day) to maximize the oocyte yield. [71,72] The addition of LH in the early follicular phase may have beneficial effect on the oocyte and hence embryo quality. However, the available evidence regarding addition of recombinant LH to FSH is inconclusive.[73] Low-dose HCG supplementation or addition of pure HMG where HCG is the source of LH activity has shown some improvements

in the oocyte yield.[74,75] Luteal start of FSH has been used to influence the recruitment of follicles without any reported clinical benefit.[76]

Agonists

Agonists are widely used in poor responders undergoing IVF to prevent an endogenous LH surge. Long agonist protocol increases both duration of treatment and total dose of gonadotropins necessary to effect follicular development in poor responders. However, agonists due to their initial flare effect may help in recruitment of the follicles. Hence, short agonist protocol where agonist administration is initiated in the early follicular phase before gonadotropin administration is one of the most widely used agonist protocols in poor responders.[77] Microdose flare and ultrashort protocols are preferred by some clinicians, in an effort to minimize the pituitary suppression, but have not shown to improve the clinical outcomes. [71,72]

Antagonists

Antagonist protocol is increasingly used in the management of women with POR undergoing IVF in the last decade. Antagonists provide an effective way of preventing premature LH surge without prolonging the treatment duration. Pregnancy rates achieved are similar to short agonist protocol. Two meta-analyses have not found any difference in the pregnancy rate between antagonist and short agonist protocols.[78,79]

Natural cycle in vitro fertilization- Natural cycle IVF is used as an alternative to the high-dose regimens in POR to reduce the gonadotropin burden, with possible improvement in oocyte quality, and to reduce the financial burden of high-dose regimens.[80-82] Modified natural cycle IVF with the addition of antagonists and small doses of FSH[83-86] or minimal stimulation combining oral letrozole or clomiphene citrate along with small doses of gonadotropins[87] to improve the number of follicles and successful oocyte retrieval are alternatives to high-dose protocols in women with POR. Cancellation in natural cycles can be as high as 50%. The pregnancy rates have been reported as 8–18% per patient and these protocols provide an alternative for poor responders when the more widely used high-dose FSH protocols are unsuccessful.[71,72]

Pretreatment with oral contraceptive pills (OCPs), progesterone, or ethinyl may improve follicular synchronization, prevent premature ovulation, and scheduling of cycles. Even though there are no differences noted in the pregnancy rates, pretreatment with OCP may increase the duration of stimulation.[88,89]

Adjuvant therapy

Androgen supplementation in the form of oral dehydroepiandrosterone or transdermal testosterone in poor responders has been explored as it is believed to improve the intrafollicular environment and follicular sensitivity to exogenous FSH. Available evidence shows a modest improvement in various parameters including number of oocytes, embryo quality, and live birth rates.[90-93]

Growth hormone (GH) supplementation – it is an another adjuvant therapy used in combination with COS in an attempt to improve oocyte yield and pregnancy rates in poor responders. Limited evidence involving small number of women suggests that GH as an adjuvant may be beneficial in poor responders.[94]but threatment with growth hormone is costly and mny authors have questioned about its use in non-GH deficient patients. Initial studies were encouraging but later on there has been so many arguments about use of GH.

Low-dose aspirin has been used in IVF in an attempt to improve pregnancy and live birth rates, and a recent study shows no improvement in IVF outcomes in poor responders following low-dose aspirin supplementation.[95]

As mentioned earlier, the existing evidence favors

an early recourse to IVF in women with POR as protracted courses of simpler treatment modalities have minimal success rate and IVF offers the highest possibility of live birth in such women.

Pregnancy rate is low with all modalities of treatment with an increased risk of pregnancy loss across all age groups.[27]

IMPLICATIONS

The impact of diminished ovarian reserve is most often seen in the context of infertility where the time available to achieve pregnancy is limited. Pregnancy rates are very low with simple forms of treatment, and IVF in such women offers the highest probability of pregnancy. Irrespective of the age, women with DOR have a lower pregnancy rate than normoresponders. Diagnosis of DOR imposes a high financial and emotional burden on such couples. Oocyte donation or adoption sometimes remains the only choices for such patients.

Whether ovarian reserve testing should be offered to women who wish to delay childbearing to assist in making an informed decision remains debatable. However, AMH is increasingly being used as a tool to predict fertility potential of such women. They then have the choice of changing their priorities and decide not to delay conception or may undergo IVF to freeze eggs or embryos for future use (social freezing).[82]

Due attention to conserving ovarian cortex during any pelvic surgery including endometrioma excision and, avoiding overenthusiastic ovarian puncture in women with polycystic ovary syndrome are important steps in minimizing the iatrogenic risk of POR. A better understanding of genetic causes may lead to development of molecular markers to assist in choosing the most appropriate COS regimes in such women.

It is known that there is a fixed time interval between onset of POR and menopause.[46] Young women with POR are hence likely to undergo menopause at an earlier age than the normal population. This has long-term health implications beyond fertility to such women, including bone and cardiovascular health.

Role of artificial intelligence- The ovarian response to COS is a quantitative reflection of the reserve function of the ovary. Poor ovarian response leads to a high risk of treatment cycles being canceled or a lack of high-quality embryos for transfer[80]. Studies have demonstrated that the impact features, e.g., a women's clinical information (age, body mass index (BMI), infertility cause, and infertility duration), basal endocrine level (Anti-Müllerian hormone (AMH), basal follicle stimulating hormone (bFSH)), and ultrasound-related index (antral follicle count (AFC)), are closely related to the extent of ovarian response to COS [9,10,11,12,13,14,15]. The features, such as age, AMH, bFSH, and AFC, etc., are currently recognized as high-impact features related to ovarian reserve function [10,16,17,18]. As the impact features have their characteristics and interact with each other, it is necessary to formulate a comprehensive and accurate relationship between them and the COS outcome, and this brings about new challenges to clinical practice. In recent years, there are booming works on building machine learning-based clinical decision models for the IVF [19,20,21,22], considering the relevant prognostic features. The machine learning algorithms, such as the artificial neural network (ANN), supporting vector machine (SVM), decision tree, and random forest have been utilized for the selection of the embryo [22], classification of ovarian response [23] and embryo [24], and prediction of the embryo implantation outcome [25], etc

Natural conception should always be encouraged in patients with diminished ovarian reserve.

CONCLUSIONS

Diminished ovarian reserve (DOR) represents a major challenge in reproductive medicine, as it is often associated with poor ovarian stimulation

response, high cycle cancellation rate, and low pregnancy rate.Poor ovarian reserve (POR) is an important limiting factor for the success of any treatment modality for infertility. Majority or women with POR need to undergo in vitro fertilization to achieve pregnancy. However, pregnancy rate remains low despite a plethora of interventions and is associated with high pregnancy loss. Early detection and active management are essential to minimize the need for egg donation in these women. Lack of universally accepted diagnostic criteria for POR has limited a meaningful comparison of therapeutic interventions in these women.

An early recourse to IVF remains the only option with reasonable chance of achieving pregnancy in such women. None of the available therapeutic interventions have the ability to overcome the barriers of low quantity and quality of eggs in women with POR. Women with POR need to be counseled regarding a limited reproductive lifespan, high cost of treatment modalities with lower than normal pregnancy rates. At present, there is no known mechanism to reduce the follicular atresia and prolong fertility. Social egg freezing is a step toward this but does not always ensure pregnancy and childbirth. Delaying childbirth as seen in most of the societies in recent years combined with an increasing incidence of POR poses a great hurdle and challenge to the concerned individuals, the specialists offering fertility services, and the researchers working on various aspects of ovarian reserve.

Fun Time

Report of Recent Advances in infertility CME held on 2nd February 2023 at Sir. H N Reliance Foundation Hospital, Girgaon, Mumbai

The Mumbai Obstetric & Gynaecological Society and H. N. Reliance Foundation Hospital organized a Workshop and CME on Recent Advances In Infertility on 2nd February 2023 between 2:00 pm to 5:00 pm at Convention Centre, 1st Floor, Kapol Nivas, Sir. H. N. Reliance Foundation Hospital, Girgaon, Mumbai - 400 004.

The program began with a Live relay of the Workshop and Lecture on Rare Sperm Vitrification demonstrated by Michael Belenky, Embryologist, Assuta Rishon Medical Center Tel Aviv. The session was coordinated by Mr. Shrenik Shah, Chief Embryologist, Well Women IVF Centre at Sir HN RFH.

This was followed by Inauguration and Lamp lighting at the hands of Dr. Tarang Gianchandani, CEO, Sir H. N. Reliance Foundation Hospital, Dr. Niranjan Chavan

President MOGS, Dr. Firuza R Parikh, Director Well Women Centre, and Dr. Asha Dalal, Director Dept of OBGYN, Sir HN RFH. Dr. Tarang Gianchandani, CEO, of Sir H. N. Reliance Foundation Hospital, welcomed all the faculty and delegates and congratulated MOGS for all efforts towards the betterment of women's health in Mumbai. She also highlighted the increase in the prevalence of infertility and announced that the state of ART Well Women Centre would be launched soon at the Sir HN RFH and would cater to the needs of all women. She also said that RFH would continue to partner with MOGS in future programs as well.

Dr. Niranjan Chavan President of MOGS addressed the gathering and thanked Dr. Firuza R Parikh, Director of Well Women Centre, and Dr. Asha Dalal, Director Dept of OBGYN, Sir HN RFH for

organizing such a splendid event with eminent faculty from Israel.

The academic session consisted of keynote addresses on key issues related to Male infertility. The first keynote was delivered by Dr. Niranjan Chavan, President of MOGS on the topic of "Micronutrients In Male Infertility". He highlighted the important roles of various micronutrients in optimizing sperm count and function. The chairpersons for the session were Dr. Ameya Purandare and Dr. Trupti Mehta.

The next keynote was delivered by Dr. Firuza Parikh, Director – of Well Women Centre, RFH on the subject of "Temporal Decline in Sperm Parameters". She gave an insightful talk on the various factors that have led to declining sperm parameters by putting forward all the research conducted by her and from across the world. The chairpersons for the session were Dr. Ritu Hinduja and Dr. Navina Singh. The final keynote was delivered by Dr. Arie Berkovitz (MD), Department of Obstetrics and Gynaecology, Meir Medical Centre, Kfar Saba, Israel on the interesting and futuristic topic "A New Attitude Towards Sperm Selection for ICSI Procedure". He explained the newer technologies and strategies in sperm micromanipulation and selection, especially the role of innovations like artificial intelligence and digital data capturing, etc. The chairpersons for the session were Dr. Asha Dalal and Dr. Firuza Parikh. The workshop and CME were attended by 60 delegates. The conveners for the CME were Dr. Ameya Purandare and Dr. Ritu Hinduja (from MOGS) and Dr. Trupti Mehta, Dr. Navina Singh, and Mr. Shrenik Shah (from Sir HN RFH). The conveners thank the President and Secretary of MOGS and Dr. Tarang Gianchandani, CEO, of Sir H. N. Reliance Foundation Hospital, Dr. Firuza R Parikh, Director of Well Women Centre, and Dr. Asha Dalal, Director Dept of OBGYN, Sir HN RFH for all the support and co-operation extended towards the successful conduct of this program.

Report of MOGS CME for World Cancer Day in Association with SAFOG Oncology Committee held on 4th February 2023

MGS CME in association with SAFOG with the theme Close the care gap was held on Tuesday, 18/03/2023 on occasion of World Cancer Day between 5 pm – 6.30 pm as a Webinar. The event was attended by about 200 gynaecologists online. The program conveners were MOGS President Dr. Niranjan Chavan, Chair of SAFOG Oncology Committee Dr. Aliya Aziz and Past Chair of the Oncology Committee Dr. Bhagyalaxmi Nayak.

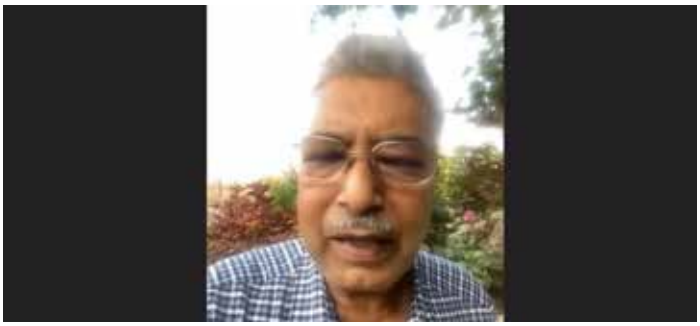
Dr. Niranjan Chavan Inaugurated the program with a virtual lamp lighting and welcomed the esteemed Chief Guests FOGSI President Dr. Hrishikesh Pai and FOGSI Secretary General Dr. Madhuri Patel who spoke a few words. The guests of Honour were also introduced and requested to say a few words. Past President FIGO Dr. C.N Purandare, SAFOG President Dr. Rohana Haththotuwa and President elect SAFOG Dr. Shyam Desai.

Our Chairpersons for the first lecture were Dr Janamejaya Mahapatra and Dr Shalini Rajaram. The speaker was Dr. Komal Chavan, who spoke on Results & Analysis of MOGS Cervical Cancer Awareness KPA Survey. Our Chairpersons for the second lecture were Dr. Sarita Bhalerao and Dr. Askok Kumar Padhy. The speaker was Dr. Harshad Parasnis who spoke on Updates in Management of Ca Endometrium.

The panel discussion on Adolescent Ovarian Tumours ~ Demystified! was ably moderated by Dr. Niranjan Chavan & Dr. Bhagyalaxmi Nayak. The panelists included Dr. Aliya B Aziz, Dr. Ugyen Tshomo, Dr. Sabera Khatun, Dr. Uzma Chisti, Dr. Tahira Yasmeen, Dr. Yapa Wijeratne, Dr. Sujeeva Weerasinghe all of whom gave clear take-home messages to the audience.

The program concluded with a Vote of Thanks proposed by Dr. Niranjan Chavan. The academic content and variety of topics were much appreciated by the audience.

We would like to thank the MOGS and the Office Bearers, our esteemed President Dr. Niranjan Chavan and Secretary Dr. Rajendra Sankpal and also the SAFOG President Dr. Rohana Haththotuwa for this opportunity.



Report of MOGS - GOLDs 51st Annual Conference held on 11th & 12th February 2023 at J. W. Marriott Hotel, Juhu, Mumbai

The Mumbai Obstetric and Gynecological Society (MOGS), on the 11th and 12th of February 2023 organized the Gynecology & Obstetrics Learning Dilemmas Solved (GOLDs) 51st Annual Conference 2023 under the leadership and guidance of Dr. Niranjan Chavan, President, MOGS.

The magnificent conference was organized at J.W. Marriott Hotel, Juhu, Mumbai, and the theme subjects were Minimal Access Gynecological Surgeries, Emergency and Operative Obstetrics, and Modern Technology in Fertility Control, which was attended by more than 850 delegates. 152 papers were read by junior and senior gynecologists with the participation of International & National speakers with more than 21 keynote speakers, 5 orations, 12 panel discussions, and 3 debates. The Conference inauguration was done at the esteemed hands of Dr. Hrishikesh Pai, President FOGSI as Chief Guest, and Ms. Varsha Usgaokar, a renowned national and famous film personality. This was followed by prize distribution & introduction of a new prize named after the well-known late Dr. Nalini N. Chavan Vision for HER Award (Heal Her, Educate Her & Respect Her) based on the theme for this year.

The congress highlights were 5 orations which included Dr. M.D. Adatia oration by Dr. Hrishikesh Pai on What's New in Artificial Reproductive Technology? MOGS Presidential oration by Dr. Niranjan Chavan on What's New in Gynec Oncology? Dr. Usha Krishna's oration by Dr. Frank Lowen from Germany, Frankfurt Teaching the Breech and its safety features, Dr. Subhash J Penkar

and Dr. Marie Pereira Silver Jubilee's oration by Dr. Pratap Kumar on Infertility & Dr. Shradhanand Thakur oration by Dr. Vanita Raut on Lessons Learned. It was a full jam-packed house for the orations.

Many well-known & renowned senior gynecologists & obstetricians were present like great vaginal Surgeon Dr. Shirish Sheth, Dr. Deepak Dave, Dr. Usha Krishna, Dr. Usha Saraiya, IVF consultants Dr. Indira Hinduja & Dr. Firuza Parikh, FIGO Past President Dr. C N Purandare, Eminent Ultrasound teacher Dr. P K Shah, Internal Iliac Surgeon Dr. Rajendra Saraogi, A A stitch expert Dr. Ashok Anand from Mumbai and SOVSI President Dr. Hara Patnaik, Cuttack, Critical Care expert Dr. Alpesh Gandhi from Ahmedabad, Dr. Sudhir Shah & Dr. Dipak Bhagde from Rajkot participated.

The evening was well spent with gynecologist letting their hair down by enjoying the Dr. Rishma Pai personality contest won by Dr. Komal Chavan, MOGS GOT TALENT on Toes! where medical college students took part in a dance competition, Bollywood Bling Ramp Walk for which the show stopper was well-known DJ Akbar Sami, and lastly the "Vision for HER" walk by all gynecologists followed by a gala dinner.

92 pages MOGS Newsletter Buzz & Bytes, issue no 3 covering the social and academic work done by MOGS from September 2022 till January 2023 was released at the hands of Guest of Honour Ms. Varsha Usgaonkar.

The Conveners of the conference were Dr. Komal Chavan, Dr. Parikshit Tank & Dr. Pratik Tambe. The vote of thanks was given by Secretary MOGS Dr. Rajendra Sankpal.

The annual conference was a phenomenal success that saw participation from around 850 delegates and faculty members globally. The spirit and enthusiasm of the faculty and the delegates were infectious and overwhelming.

Screening and Monitoring of Diabetes in Pregnancy

Dr. Komal N. Chavan
MD, DNB, MNAMS, FCPS, DGO, FICOG, Diploma in Reproductive Medicine (UKSH)

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as 'carbohydrate intolerance with recognition or onset during pregnancy', irrespective of the treatment with diet or insulin

Hyperglycaemia first detected at any time during pregnancy should be classified as either :

- Diabetes mellitus in pregnancy
- Gestational diabetes mellitus

Diabetes in pregnancy should be diagnosed by the 2006 WHO criteria for diabetes if one or more of the following criteria are met:

- fasting plasma glucose ≥ 7.0 mmol/l (126 mg/ dl)
- 2-hour plasma glucose ≥ 11.1 mmol/l (200 mg/dl) following a 75g oral glucose load
- random plasma glucose ≥ 11.1 mmol/l (200 mg/ dl) in the presence of diabetes symptoms.

In women with pregestational diabetes, HbA1c is strongly associated with fetal anomaly risk. Infants of diabetic mothers had an 8% major anomaly rate. HbA1c of 10% in pregnancy is associated with a 10% anomaly rate. HbA1c of 13% in pregnancy is associated with a 20% anomaly rate. Preconceptual care is important to reduce prevalence.

Gestational diabetes mellitus should be diagnosed at any time in pregnancy if one or more of the following criteria are met:

- fasting plasma glucose 5.1-6.9 mmol/l (92 -125 mg/dl)
- 1-hour plasma glucose ≥ 10.0 mmol/l (180 mg/dl) following a 75g oral glucose load*
- 2-hour plasma glucose 8.5-11.0 mmol/l (153 -199 mg/dl) following a 75g oral glucose load

PATHOPHYSIOLOGY

Insulin requirements: Increase till 9 weeks, decrease to a nadir by 16 weeks, increase gradually till 36 weeks then drop gradually till term. Pregnancy unmasks the tendency toward Type II DM via the following mechanisms.

- Hormones in pregnancy i.e human placental lactogen, estrogen, progesterone, cortisol, and prolactin decrease peripheral insulin sensitivity.
- Insulinase in placenta
- Increased maternal hepatic glucose production
- Increased insulin resistance- new mediators implicated – TNF alpha, Leptin , Resistin.
- Increased GLUT 1 expression in syncytiotrophoblast of placenta

HIGH RISK FOR GESTATIONAL DIABETES MELLITUS

- Maternal age >25 years
- Body mass index >25 kg/m^2
- Ethnicity- Latina, Native American, South or East Asian, Pacific Island ancestry, African American
- Personal/Family history of DM
- PCOS

- History of macrosomia/LGA baby
- Glycosuria

LOW RISK FOR GESTATIONAL DIABETES MELLITUS

- Age <25 years
- Not a member of an ethnic group with high prevalence of GDM
- Normal pre pregnancy body weight (not 20% or more over desired body weight or BMI 27 kg/m^2 or more)
- No family history of diabetes in first-degree relatives. No history of abnormal glucose tolerance. No history of poor obstetric outcome

SCREENING

Whom to Screen?

According **to American Diabetes Association** screening should be done only for high-risk women.

- Body mass index more than 30 kg/m2
- Previous macrosomic baby weighing 4.5 kg or more
- Previous gestational diabetes
- Family history of diabetes (first-degree relative with diabetes)
- Family origin with a high prevalence of diabetes
- Clinical conditions associated with insulin resistance like PCOS.

FOGSI and FIGO recommend universal screening.

- FOGSI recommends screening of every pregnant woman at the 1st visit using the DIPSI guidelines.
- This single step screening method is recommended by both FOGSI and FIGO.

DIPSI RECOMMENDATIONS

DIPSI came into existence on 12 December, 2004 and the criteria was proposed in August 2006.

Diabetes in Pregnancy Study Group India (DIPSI diagnostic criteria 2-hour PG ≥ 140 mg/dL is similar to WHO criteria 2-hour PG ≥ 140 mg/dL to diagnose GDM).

Pregnant women given a 75 g oral glucose load, irrespective of whether she is in the fasting or non-

Table 1:

	Glucose load	Fasting	1 hr	2 hr	3 hr	Values
ADA (2016)	75 gm (1 step)	92	180	153	-	Any 1
	50 gm (2 step)	-	140	-	-	Confirm OGTT
WHO (2013)	75 gm	92-125	180	153-199	-	Any 1
ACOG (2013)	50 gm	-	140	-	-	Confirm OGTT
DIPSI (2010)	75 gm	-	-	140	-	
IADPSG (2010)	75 gm	92	180	153	-	Any 1

Table 2:

2 hr plasma Glucose	In Pregnancy	Outside Pregnancy
> 200 mg / dl	Diabetes	Diabetes
> 140 – 199 mg / dl	Gestational Diabetes Mellitus (GDM)	Impaired Glucose Tolerance (IGT)
120 – 139 mg / dl*	Gestational Glucose Intolerance (GGI)	
< 120 mg / dl	Normal	Normal
*Needs follow up		
The term IGT should not be used to indicate any glucose intolerance in pregnancy (as this terminology is used outside pregnancy)		

fasting state and without regard to the time of the last meal (Kolkata declaration 2010).

A venous blood sample is collected at 2 hours for estimating plasma glucose by the GOD-POD method.

If the test is normal, the test is repeated at 24-28 weeks and then at 32-34 weeks.

Target levels:

Fasting glucose - 90 (80- 90) mg/dl.

Peak postprandial - 120 (110 - 129) mg/ dl respectively.

MONITORING OF SUGARS

A. Government of India guidelines :

Once GDM is diagnosed, the mother has advised MNT. It consists of meals where carbohydrate intake is controlled & optimization of nutrition to meet the nutrition needs of the mother and the foetus. The plan includes energy appropriate for optimum weight gain and for maintenance of normal glucose levels with appropriate exercise. When on MNT, blood glucose 2 hours after a meal (PPBS) is checked after 15 days. If less than 120mg/dl - continue on MNT and exercise. If the PPBS is not maintained at <120mg/dl and she is less than 20 weeks pregnant, insulin therapy is started. On insulin therapy, blood sugar is monitored every third day or frequently. The target levels of FBS are less than 95 and PPBS less than 120mg/dl. If the woman is more than 20 weeks gestation and her PPBS is more than 120mg/dl, she is started on metformin. When on metformin, blood sugars are tested twice in a week. Metformin is started at 500m/day twice daily and is increased up to 2 gm/day until blood sugar control is obtained. The advantages of metformin over insulin is the reduced maternal weight gain and incidences of hypoglycemia. If blood sugar target levels are not obtained with metformin, injection insulin is added. If the two-hour PPBS is very high at the initial diagnosis of GDM, Insulin is started at once.

B. NICE Guidelines:

According to the NICE Guidelines, GDM is diagnosed when there is a fasting plasma glucose level of 5.6mmol/L or a 2-hour plasma glucose level of 7.8mmol/L. Once the diagnosis of GDM is made, the patient is advised diet therapy and exercise. The patient is reviewed after 1-2 weeks. If the target levels are not met, oral metformin or insulin therapy is initiated. Insulin is started at once if there is a contraindication or if the patient is not interested in metformin therapy. If target levels are not attained on metformin therapy, insulin is added. Glyburide is initiated if there is intolerance to metformin or the patient refuses insulin therapy and is not controlled on metformin therapy.

Immediate initiation of insulin therapy:

a. If the fasting glucose level is more than 7.0mmol/L at diagnosis.

b. If the fasting glucose level is between 6.0 and 6.9mmol/L and there is macrosomia or hydramnios.

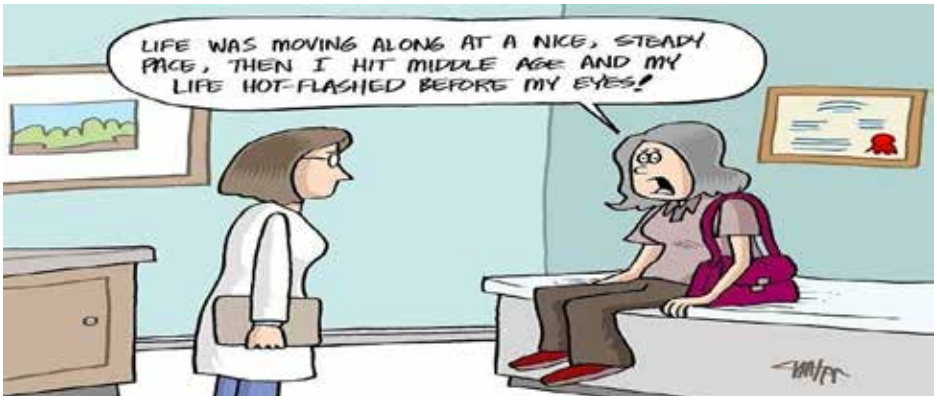
ACOG (2013)

All pregnant women should be screened for gestational diabetes using history, clinical risk factors, or glucose screening tests. Screening for gestational diabetes usually occurs at 24 to 28 weeks' gestation. Early screening is recommended in women with risk factors (i.e., history of gestational diabetes, known impaired glucose metabolism, or obesity [body mass index of 30 or more]). If early screening results are negative, screening should be repeated at 24 to 28 weeks' gestation.

TIME OF ANTENATAL APPOINTMENTS

16 weeks	Offer retinal assessment at 16-20 weeks to women with pre-existing diabetes if diabetic retinopathy was present at their first antenatal clinic visit. Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the second trimester.
20 weeks	Offer an ultrasound scan for detecting fetal structural abnormalities, including examination of the fetal heart (4 chambers, outflow tracts and 3 vessels).
28 weeks	Offer ultrasound monitoring of fetal growth and amniotic fluid volume. Offer retinal assessment to all women with pre-existing diabetes. Women diagnosed with gestational diabetes as a result of routine antenatal testing at 24-28 weeks enter the care pathway.
32 weeks	Offer ultrasound monitoring of fetal growth and amniotic fluid volume. Offer nulliparous women all routine investigations normally schedule for 31 weeks in routine antenatal care.
34 weeks	No additional or different care for women with diabetes.
36 weeks	Offer ultrasound monitoring of fetal growth and amniotic fluid volume. Provide information and advice about: • Timing, more and management of birth • Analgesia and anaesthesia • Changes to blood glucose-lowering therapy during and after birth • Care of the baby after birth • Initiation of breastfeeding and the effect of breastfeeding on blood glucose control • Contraception and follow-up
37^{+6} weeks to 38^{+6} weeks	Offer induction of labour, or caesarean section if indicated, to women with type 1 or type 2 diabetes; otherwise await spontaneous labour.
38 weeks	Offer tests of fetal wellbeing.
39 weeks	Offer tests of fetal wellbeing. Advise women with uncomplicated gestational diabetes to give birth no later than 40^{+6} weeks.

Fun Time

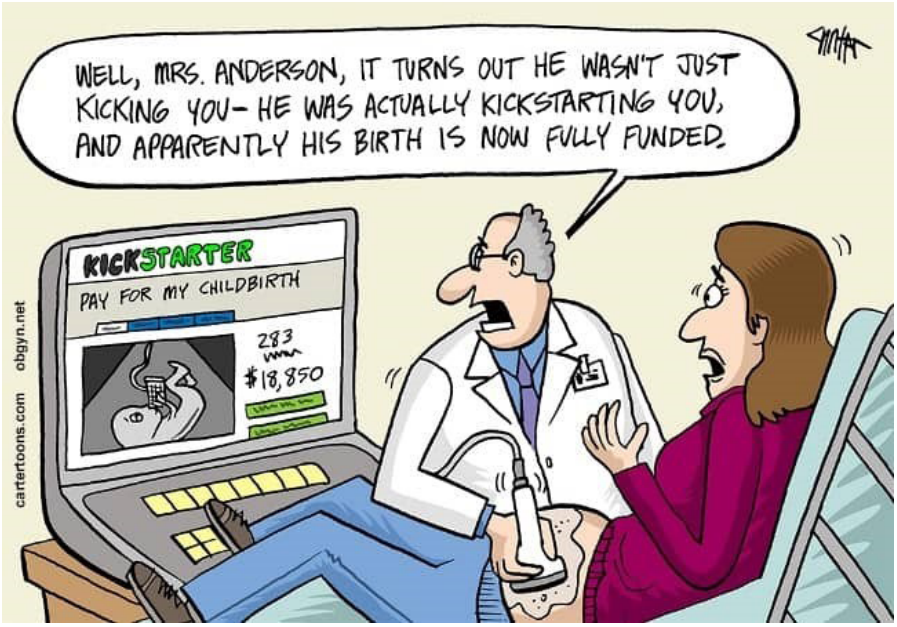


MOGS Learn with Fun (Q & A)

by Dr. Radhika Bhutada and Dr. Monika Dhauchak

1. The shortest diameter in fetal head is:
   a. Biparietal diameter
   b. Suboccipito frontal diameter
   c. Occipito frontal diameter
   d. Bitemporal diameter
2. The risk of endometrial carcinoma is the highest with the following histological pattern of endometrial hyperplasia:
   a. Simple hyperplasia without atypia
   b. Simple hyperplasia with atypia
   c. Complex hyperplasia without atypia
   d. Complex hyperplasia with atypia
3. CA-125 is a marker antigen for the diagnosis of:
   a. Colon cancer
   b. Breast cancer
   c. Brain cancer
   d. Ovarian cancer
4. The risk of Asherman syndrome is the highest if Dilatation and Curettage (D & C) is done for the following condition:
   a. Medical termination of pregnancy
   b. Missed abortion
   c. Dysfunctional uterine bleeding
   d. Post partum haemorrhage
5. With which of the following types of viral hepatitis infection in pregnancy, the maternal mortality is the highest?
   a. Hepatitis A
   b. Hepatitis B
   c. Hepatitis C
   d. Hepatitis E

Fun Time



Report of MOGS Outreach CME on Key Issues in Obstetrics and Gynecology held on 22nd February 2023 at Fortis Hospital, Mulund

The program coordinators were Dr. Atul Ganatra, Dr. Pratik Tambe, and Dr. Sonal Kumta. We were privileged to have eminent senior gynecologists including Dr. Shraddha Upasani, Dr. Anjali Tillu, and Dr. Bhavna Hingwala as faculty at the event. The program was accredited with 2 ICOG and 1 MMC credit point.

Dr. Pratik Tambe, one of the conveners, welcomed the delegates and the faculty and thanked the MOGS for the opportunity to conduct this event. The scientific proceedings began with a video message from our MOGS President Dr. Niranjan Chavan who spoke on the various forthcoming events and multiple unique initiatives launched during the MOGS year.

Our Chairpersons for the first session were Dr. Anjali Tillu, Dr. Bhavna Hingwala, and Dr. Anjali Talwalkar. The first speaker was Dr. Siddesh Iyer, who spoke on Intrapartum Monitoring: When and How and covered the topic excellently in a short space of time. Dr. Shrutika Thakkar was the next speaker and she explained Which Antioxidants Work in Clinical Practice. Dr Anita Soni was the session's final speaker and spoke on Contraception in Perimenopause.

The Chairpersons for the second session were Dr. Shraddha Upasani, Dr. Aparna Padgaonkar, and Dr. Mandakini Megh. Dr. Sonal Kumta explained why hyperhomocysteinaemia is Important with practical and evidence-based discussions. Dr. Atul Ganatra demonstrated Uterine Artery Ligation in Gynecology with a series of excellent videos demonstrating all the spaces in the pelvis. The session's final speaker was Dr. Pratik Tambe who questioned whether Natural Cycle FET is a Better Alternative to conventional HRT FET. All the talks in the session were widely appreciated for their content and their uniqueness in the scientific problem-solving approach illustrated by the speakers.

The case-based panel discussion on PPH: Preventing Maternal Morbidity and Mortality was ably moderated by Dr. Madhuri Mehendale using a variety of clinical scenarios. The panelists included Drs Punit Bhojani, Rohan Palshetkar, Shreya Prabhoo, Nageshwari Nanda, Shailendra Jadhav, and Manjiri Mehta all of whom gave clear take-home messages to the audience.

The program concluded with a Vote of Thanks proposed by Dr. Sonal Kumta. Apologies were

received from Drs Ameya Purandare, Suman Bijlani, Anjali Deval, and Sanjeev Khot. The academic content and wide variety of topics were much appreciated by the audience. Top-notch evidence-based talks, participation from senior MOGS members, and appearances by MOGS Managing and Youth Council members were the highlights of this event. Despite it being conducted on a weekday and traffic woes owing to BMC roadworks, we had an excellent audience.

We would like to thank the MOGS and the Office Bearers, our esteemed President Dr. Niranjan Chavan and Secretary Dr. Rajendra Sankpal for this opportunity, and the Fortis Hospital authorities for their kind cooperation.

Recent Advances in Stress Urinary Continence

Prof. (Dr.) J. B. Sharma

Chairperson, Urogynaecology Committee FOGSI, Professor, Obs & Gynae & Incharge Urogynaecology AIIMS, New Delhi

Urinary incontinence has a significant effect on the quality of life for many women. The prevalence of urinary incontinence is low in young women, peaks around menopause and rises steadily thereafter into later life. A full diagnostic evaluation of urinary incontinence requires a thorough medical history, drug history, storage symptoms, abdominal, pelvic, and neurological examination, urinalysis, and other tests. Majority of women do not seek medical help for this condition. Management can be done using either surgical or non-surgical methods. Initially, non-surgical techniques are used to manage the condition and in case of failure, surgical methods are advised. The present article reviews recent advances in the diagnosis and treatment strategies for the management of stress urinary incontinence.

INTRODUCTION

The primary functions of the urinary bladder include storage and excretion of urine. Looking closely at the anatomy of the bladder, we know there are two ureters and urethral openings, internal urethral sphincter, and external urethral sphincter where the latter is in our voluntary control. The supports of the urethra are classified as extrinsic and intrinsic supports. Extrinsic supports include levator ani, endopelvic fascia and arcus tendineus fasciae pelvis. The intrinsic supports are the striated and smooth muscles of the urethra, epithelial coaptation of the folds of the urethra, tone of the urethra, urethral elasticity, congestion of the submucosal venous plexus.

During childbirth, the extrinsic supports such as endopelvic fascia and arcus tendineus fasciae pelvis get torn or affected. Furthermore, with advancing age of a woman, the estrogen levels drop leading to thinning of the intrinsic supports of the urethra. All of this may result in urinary incontinence at later years of life though not immediately after childbirth.

The proximal urethra is an intraabdominal organ. In extrinsic support-hammock hypothesis, whenever there is a raise in the intraabdominal pressure, it causes the urethra to close against the hammock. However, after childbirth trauma, the proximal urethra gets displaced. Hence the raise in the intraabdominal pressure is communicated to the bladder but not to the urethra. This leads to a raise in intraabdominal pressure than intraurethral pressure resulting in the leakage of urine.

The sympathetic nervous system is placed from T10-L2, which inhibits the detrusor muscle and the stimulation of the urethral muscle. The parasympathetic nervous system from S2-S4 causes the stimulation of the detrusor muscle and inhibition of the urethral muscle. The somatic nervous system from S2-S4 can stimulate the external sphincter. The parasympathetic nervous system plays a major role in enabling urine passage.

The American College of Gynecology in 2014 defined urinary incontinence as a condition of involuntary loss of urine on effort, physical exertion, sneezing or coughing that is often bothersome to the patient and frequently affects the quality of life.

GRADING OF URINARY INCONTINENCE

- Grade 0 – Continent
- Grade 1 – Loss of urine with sudden increase in intraabdominal pressure not in bed at night
- Grade 2 – Incontinence worsens with lesser degree of physical stress
- Grade 3 – Incontinence with walking, standing erect from sitting position, or sitting up in the bed
- Grade 4 – Total incontinence occurs, and urine is lost without relation to physical activity.

EPIDEMIOLOGY

The prevalence of urinary incontinence is low in young women, peaks around menopause and rises steadily thereafter into later life. The prevalence of mixed incontinence is higher than urge incontinence. According to various studies, an average of 45% of women between 30 and 60 years of age experience urinary incontinence. Among women with stress urinary incontinence (SUI), 77.5% of them have bothersome symptoms. Hence, it is necessary to generate awareness in patients regarding the condition to be able to provide necessary treatments. In India, there is a 8–9% prevalence of urinary incontinence with a high prevalence of urological symptoms during pregnancy as compared to before pregnancy with incidence of SUI being 19% in second and 21% in the third trimester of pregnancy.

RISK FACTORS FOR URINARY INCONTINENCE

- Pregnancy and vaginal delivery
- Caffeine and fluid intake
- Medications such as diuretics, alpha-blockers, etc
- Constipation, chronic cough
- Conditions affecting mobility
- Medical conditions such as diabetes, stroke, etc.
- Oral estrogen substitution and body mass index (Modifiable risk factors). A detailed evaluation of history and other risk factors should be performed to give the best management options. A right diagnosis only will lead to the best management of the condition. An International Urogynecological Association and International Continence Society Joint on the terminology for female pelvic floor dysfunction is as mentioned below:
- SUI: Complaint of involuntary loss of urine on effort or physical exertion
- Urgency Incontinence: Complaint of involuntary loss of urine associated with urgency
- Postural (urinary) Incontinence: Complaint of involuntary loss of urine associated with a change of body position
- Mixed Urinary Incontinence: Complaint of involuntary loss of urine associated with urgency and with physical exertion
- Continuous Incontinence: Complaint of continuous involuntary loss of urine
- Insensible Incontinence: Complaint of urinary incontinence where the woman has been unaware of how it occurred
- Coital Incontinence: Complaint of involuntary loss of urine with coitus.

STEPS TO APPROACH PATIENTS WITH URINARY INCONTINENCE

It is important to evaluate patients with urinary incontinence to identify the right cause which will lead to better management outcomes. The common steps to be followed are as mentioned below:

- Patient history: Review all the symptoms with utmost importance including duration, QoL, etc.
- Storage symptoms: Assess the frequency, nocturia, urgency, and incontinence

- Voiding symptoms: Hesitancy, slow stream, positiondependent micturition, dysuria, etc.
- Past medical history: Review all other conditions such as pulmonary disease, neurological disease.
- Drug history
- Previous surgical history and treatment for incontinence
- Menstrual and obstetric history.

Other laboratory investigations and general examination of the patient should include the following:

- Abdominal examination: Mass impinging on the bladder, hernias, over-distended bladder
- Pelvic examination: Excoriation, prolapse, atrophy, tone of the pelvic muscles, demonstration of leak, cough stress test, Bonney's test, Q tip test, Pediatric Foley's test
- Neurological examination: Mental status, anal reflex, bulbocavernosus reflex, perineal sensation
- Urinalysis: Bacteriuria, hematuria, glucosuria, post-void residual volume (n < 50 ml)
- Cystoscopy, magnetic resonance imaging, computed tomography, and X-ray are not recommended except for some rare cases
- Pad test: This test allows the detection and quantification of incontinence. The test is observed for a period of 1 h after drinking 500 ml of water and doing a certain set of exercises
- Dye test using phenazopyridine, indigo carmine, and methylene blue: This test can be performed when there is a doubt if the discharge is truly urine. It can be done to exclude extra-urethral incontinence.

BONNEY'S TEST

This is a routine test performed to identify urinary incontinence. Cough stress test is done to confirm SUI. Elevation of urethra against the pubic bone – No leak on cough stress (Positive Bonney's Test) – Good prognosis for urethral elevation surgeries. This causes direct urethral compression and hence it is difficult to diagnose urethral hypermobility.

Miyazaki – Bonney's Test: This test is to assess if Burch colposuspension can be used. When the anterior vaginal wall is stretched superolaterally up to the lateral pelvic wall using ring forceps and the test is positive, Burch procedure can result in favorable outcomes.

Q-tip Test: This test is used for the demonstration of hypermobility. The measurement of change in the Q-tip angle is checked after the Valsalva maneuver. If the hypermobility is more than 30 degrees, then the Q-tip test is considered positive. Burch procedure is suitable for patients reporting positive for this test.

Pediatric Foley's Test :This test is performed to screen for intrinsic sphincter deficiency (ISD) and is similar to the test performed for cervical incompetence. In this procedure, No. 8 Foleys is inserted into the urethra without inflation. In normal patients, the foleys cannot be withdrawn if it is inflated, however, if it can be withdrawn with inflation, the test is considered to be ISD positive. A micturition diary is a tool that helps in observation and record-keeping for both the HCPs and the patients to understand the leakage frequency, duration, etc. Maintaining records for a minimum of 3–7 days can ensure good understanding and results.

URODYNAMICS

Both the American College of Obstetricians and Gynecologists and the Royal College of Obstetricians and Gynecologists recommend urodynamics to be done only for certain cases and not all cases.[1] It is especially useful for complicated incontinence cases.

It is recommended to be done in indications such as:

- Where the results may change the management such as prior to most invasive treatments
- After any treatment failure if more information is needed to plan further therapy
- As a part of both initial and long-term surveillance programs in some types of neurogenic lower urinary tract dysfunction. The urodynamic study gives objective information about the lower urinary tract function. It also helps in the correct diagnosis and classification of incontinence. There are 4 main components of this study as mentioned:[2]
- Uroflowmetry: It is a simple procedure where the volume of urine is plotted over time. The normal flow rate is 15–25 ml/s and if the flow rate is <10 ml/s it must be considered as an atonic bladder or having urethral obstruction.
- Cystometry: It is a pressure study conducted using a filling catheter, a bladder pressure catheter, and a vaginal pressure catheter to measure the results [Table 1].
- Tests of urethral function: Valsalva leak point pressure, fluoroscopic and cystoscopic assessment of the bladder neck[3]
- Voiding cystometrogram: Pressure flow study.

According to the European Association of Urology, 5–69% of women have at least one episode of SUI. About 50% of women with incontinence have SUI. The annual incidence of SUI is 4–10 %.

MCGUIRE CLASSIFICATION OF SUI

There are three types of SUI according to this classification as mentioned below:

Type 1 and 2: Occur because of urethral hypermobility

Type 3: Occur because of ISD.

MANAGEMENT OF SUI

The management of SUI can be done either through surgical or non-surgical methods. Initially,

Table 1: Normal cystometric values Parameter Value Residual urine 15 ml/s

Parameter	Value
Residual Urine	<50 ml
First desire to void	150-250 ml
Cystometeric Capacity	400-600 ml
Maximum detrusor pressure	
Filling	<15 cm H2O
Voiding	<70 cm H2O
Peak Urine Flow Rate	>15 ml/s

non-surgical techniques are used to manage the condition and in case of failure using these, surgical methods are advised.

The non-surgical management methods include:

- Lifestyle changes such as weight reduction, decreased caffeine intake, fluid restriction, and bladder training
- Physical therapy for pelvic floor muscle training with Kegel's exercises restore the muscle tone, strengthen the pelvic floor muscles, and improve the pelvic organ support. Improvement of symptoms can be seen in 6 weeks
- Bladder drill and bio feedback are computerized bio feedback devices using small sensors close to the muscles being monitored to record electrical activity. This feedback mechanism allows the patient to understand which muscles are being used. There are two types of sensors – tampon-link to be placed in the vagina and external stick-on type of sensor outside the vaginal opening
- Vaginal cones are not available in India but are a good way of toning muscles
- Medical management using estrogens, alpha agonists, betablockers etc. are not beneficial.
- Duloxetine: It is a selective serotonin and norepinephrine reuptake inhibitor. It stimulates the pudendal nerve increasing the urethral sphincter tone.[4] The surgical management methods include the following:

Table 2

Transabdominal	Transvaginal	Laproscopic
Advantages 1. Excellent exposure and access 2. Long term data supporting its durability 3. Opportunity to repair coexisting abdominal pathology	1. Less complications, short operating time 2. More effective than TVT or TOT	**Advantages** 1. Miniature abdominal incision 2. Decrerased post operative pain and recovery 3. Decreased postoperative voiding dysfunction 4. reduced blood loss 5. shortened hospitalization
Disadvantages 1. Large incision 2. Prolonged hospital stay and recovery period		**Disadvantages;** 1. Surgeon's expertise 2. Longer operating time

- Abdominal retropubic suspension 1. Burch retropubic urethropexy 2. Marshall-Marchetti-Krantz procedure 3. Paravaginal repair 4. Vaginal obturator shelf.
- Laparoscopic retropubic suspension 1. Laparoscopic Burch suspension 2. Laparoscopic paravaginal repair.
- Tension free midurethral slings 1. Tension free vaginal tape (TVT) 2. Transobturator approach – inside out/outside in 3. TVT secur 4. Mini arc slings surgery 5. Minitape.

BURCH COLPOSUSPENSION

This procedure ensures 90% cure rate within 1 year and 70% cure rate for 5 years. Complications can include voiding difficulty, de novo detrusor overactivity, and genitourinary prolapse. Types of Burch Colposuspecsion are given in Table 2.

TVT

- Introduced in 1996 by Ulmsten et al. and is a long-term treatment for SUI
- In this procedure, a synthetic tape is passed transvaginally at the mid-urethral level through the retropubic space, and the rationale for the treatment is based on the integral hammock theory of UI
- TVT is widely accepted as it is minimal invasive procedure, shorter hospital stays, similar success rates as Burch, decreased morbidity, and cost-effective procedure
- The success rate is 96.6% in 1-year post-surgery and 83% at 5 years.

PUBOVAGINAL SLING

- It combines the vaginal and abdominal procedure with the sling passing around the bladder neck and the urethra
- It provides support and compresses the urethra
- The types of slings include autologous, heterologous, and synthetic models.

ARTIFICIAL SPHINCTER

- This can be used as a primary procedure in women with ISD where an inflatable cuff is placed around the bladder neck and proximal urethra to provide occlusion, reservoir is placed to allow deflation, and a pump in labia majora
- When the patient wants to void, the cuff is deflated by labial pump, and it reinflates after 2 min of voiding

- The cure rate is 80% and the improvement rate is 90%

CONCLUSION

The treatment of SUI in women has seen revolutionary changes in the past years. Advances in the treatment of SUI have provided physicians and patients with various options and advantages. The future trends include stem cell therapy where myoblasts, fibroblasts, and neuronal stem cells are used. Injected ultrasonography guidance into the external urethral sphincter can be another explorable option.

Soduku

By Dr. Shruti Rane & Dr. Rutuja Mohite

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	8		1		5		3	
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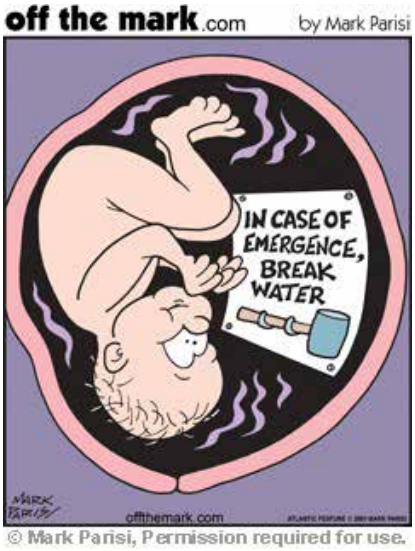
Fun Time



Report of MOGS Women's Day Celebration held on 9th March 2023 at The Hotel Orchid, Vile Parle East, Mumbai

The President and the Managing Council of the Mumbai Obstetrics and Gynaecological Society along with the Association of Medical Women In India- Mumbai Branch organized a Women's Day Celebrations CME on - Thursday 9th March 2023 from 7 p.m. - 10:30 pm at THE HOTEL ORCHID, Vile Parle East, Mumbai.

The CME had 1MMC POINT and 2 ICOG POINT Credit Points. The CONVENERS were Dr Komal Chavan and Dr Priya Vora. Masters of Ceremony were Dr Jagruti Ghosh, Dr Pradnya Changede & Dr Aditi Tandon. After welcome & registration the Scientific Programme went off well in the following manner. The chairpersons for the Junior Scan were Dr Rupali Dharwadkar and Dr Maya Gade. Dr Jagruti Ghosh spoke on Quatre folic: Latest generation smart folate. Then was the Keynote address by National President AMWI Dr Mandakini Megh on the Prevention of Primary Caesarean Section. The chairpersons were Dr Geetha Balsarkar and Dr Pratik Tambe.

Then we had the AMWI, Mumbai Branch Dr Homai Colabawala Oration on HPV and cervical cancer by Dr Sarita Bhalerao. The chairpersons were Dr Bakhtawar Vajifdar, Dr Anahita Chauhan, and Dr Priya Vora. This was followed by AMWI Mumbai Branch - Rashmi Ramkrishna Pethe Oration on Topic - Prediction, Prevention & Management of Preterm Labour by Dr Madhuri Patel, Dr Suvarna Khadilkar.

Dr Mandakini Megh & Dr Komal Chavan chaired the oration. Both the orators were felicitated with a plaque & shawl. Then we had the Inauguration ceremony & Felicitation & Award Ceremony. Dr Manohar Motwani, Dr SN Agarwal, Dr. Asha Dalal, Dr. Sujata Dalvi, Dr Bakhtawar Vajifdar, Dr Rajendra Chauhan ,Dr Sangeeta Agrawal, Dr Nikhil Datar ,Dr. Kartikeya Bhagat, Dr Supriya Arwari, and Dr Nilima Vaidya were all felicitated for their extensive work on women's health by Dr Niranjan Chavan, Dr Anahita Chauhan, Dr Sarita Bhalerao and the convenors.

Following this was an interesting panel discussion on Enigmatic Endometriosis. The Moderator was Dr Ganpat Sawant, and the Panellists were Dr Sujata Dalvi, Dr Priti Vyas, Dr Punit Bhojani, Dr Ridhi Desai, Dr Pradnya Supe, Dr Pradnya Changede, Dr Aditi Tandon, Dr Asmita Pandey. The panelists gave very important take-home points.

Followed by audience Interaction and Dinner. Total attendance was 112. The convenors would like to thank President Dr Niranjan Chavan, Secretary Dr Rajendra Sankpal & Treasurer Dr Geetha Balsarkar & Spectra division of Sun Pharma for the educational grant.

Report of MOGS Outreach CME on Key Issues in Obstetrics and Gynecology held on 18th March 2023 at GCC Club, Mira Bhayender

A MOGS Outreach CME on Key Issues in Obstetrics and Gynaecology was held on Wednesday, 18/03/2023 between 7 pm – 11 pm at GCC Club, Mira Bhayender. The event was supported by Spectra and was attended by about 65 gynecologists.

The program conveners were Dr. Rajendra Nagarkatti, Dr. Urmila Sureka and Dr. Pratik Tambe. The co-ordinators were Dr. Navneet Desai, Dr. Ashwini Kalyankar, Dr. Jagruti Ghosh and Dr. Sarita Channawar. The program was accredited with 2 ICOG and 1 MMC credit point.

Dr. Ashwini Kalyankar, one of the co-ordinators, welcomed the delegates and the faculty and thanked the MOGS for the opportunity to conduct this event. The scientific proceedings began with a video message from our MOGS President Dr. Niranjan Chavan who spoke on the various forthcoming events and multiple unique initiatives launched during the MOGS year.

Our Chairpersons for the first session were Dr. Shravan Desai, Dr. Urmila Sureka and Dr. Madhu Vyas. The first speaker was Dr. Navneet Desai, who spoke on New generation Smart Folate and covered the topic excellently in a short space of time. Dr. Rohan Palshetkar was the next speaker and he spoke on Predicting Ovarian Response. Dr Jagruti Ghosh was the session's final speaker and spoke on Pregnancy and Obesity.

The Chairpersons for the second session were Dr. Sanjay Shah, Dr. Vipin Checker and Dr. Mandakini Megh. Dr. Pratik Tambe gave us the latest developments in Preventing Preterm Labour. Dr. Rajendra Nagarkatti spoke about the use of 4th Generation COCs for endometriosis. All the talks in the session were widely appreciated for their content and their uniqueness in the scientific problem-solving approach illustrated by the speakers.

The case-based panel discussion on Hypertensive disorders in pregnancy was ably moderated by Dr. Pradnya Changede and Dr. Deepali Kale using a variety of clinical scenarios. The panelists included Drs Rajendra Saraogi, Rakesh Pandia, Kiran Dane, Sanjay Manjalkar, Riddhi Desai, Priti Sharma, Kiran Shinde and Sarita Channawar all of whom gave clear take-home messages to the audience.

The program concluded with a Vote of Thanks proposed by Dr. Pratik Tambe. The academic content and wide variety of topics were much appreciated by the audience. Top-notch evidence-based talks, participation from senior MOGS members, and appearances by MOGS Managing

and Youth Council members were the highlights of this event. Despite it being conducted on a weekday and traffic woes owing to BMC roadworks, we had an excellent audience

We would like to thank the MOGS and the Office Bearers, our esteemed President Dr. Niranjan Chavan and Secretary Dr. Rajendra Sankpal for this opportunity, and the GCC Club authorities for their kind cooperation.

Report of MOGS Outreach CME on Key Issues in Obstetrics and Gynecology held on 23rd March 2023 at Fortis Hospital, Mulund

A MOGS Outreach CME on Key Issues in Obstetrics and Gynaecology was held on Thursday, 23/03/2023 between 1 pm – 5 pm at Fortis Hospital, Mulund. The event was supported by Emcure and was attended by about 45 gynecologists.

The program conveners were Dr. Atul Ganatra, Dr. Pratik Tambe and Dr. Sonal Kumta. The program was accredited with 2 ICOG and 1 MMC credit point.

The Event started off with Lunch and Registration. The scientific proceedings began with a video message from our MOGS President Dr. Niranjan Chavan who spoke on the various forthcoming events and multiple unique initiatives launched during the MOGS year.

Our chairpersons for the first session were Dr. Anjali Tillu, Dr. Rita Mehra, Dr. Shubhada Gupta and Dr. Sandeep Jeste. The first speaker was Dr. Yogesh Trivedi, who spoke on Mandatory Antenatal Investigations. Dr. Geetha Balsarkar was the next speaker and she spoke on Vaginal Birth After Caesarean Section. Dr Rohan Palshetkar was the session's final speaker and spoke on Anaemia Mukt Bharat: Is it Only a Dream?

The Chairpersons for the second session were Dr. Shraddha Upasani, Dr. Kishori Kadam, Dr. Suman Bijlani and Dr. Pratik Tambe. Dr. Dhruti Mahajan gave us the Importance of Urodynamic Studies. Dr. Shreya Padgaonkar spoke on the topic Freeze all? The final talk was by Dr. Atul Ganatra on Placenta Accreta spectrum Disorders.

The case-based panel discussion on Medical disorders in pregnancy was ably moderated by Dr. Komal Chavan and Dr. Ganpat Sawant using a variety of clinical scenarios. The panelists included Drs Sonal Kumta, Anoop Gupta, Bhavin Bhayani, Tushar Palve, Payal Lakhani, Mahesh Medhekar, Meenal Sarmalkar, Bharti Morey, Dipti Mhatre, Freni Shah all of whom gave clear take-home messages to the audience.

The program concluded with a Vote of Thanks proposed by Dr. Pratik Tambe. The academic content and wide variety of topics were much appreciated by the audience. Enthralling talks, participation from senior MOGS members, and appearances by MOGS Managing and Youth Council members were the highlights of this event. The outcome of the audience on a weekday was commendable.

We would like to thank the MOGS and the Office Bearers, our esteemed President Dr. Niranjan Chavan and Secretary Dr. Rajendra Sankpal for this opportunity, and the Fortis Hospital authorities for their kind cooperation.


The Mumbai Obstetric
aecological Society


The Mumbai Obstetric
& Gynaecological Society
Niranjan Chavan
President
Dr. Rajendra Sankpal
Secretary
Dr. Geetha Balsarkar
Treasurer


Atul Ganatra


The Mumbai Obstetric
& Gynaecological Society


The Mumbai Obstetric
Options for a patient
with previous cesarean
Trial of labor after cesarean (TOLAC)


The Mumbai Obstetric
& Gynaecological Society
MAGNESIUM SULPHATE
Fortis

Vaccination in Pregnancy

Dr. Bipin Pandit
Gynecologist Obstetrician Infertility IVF

INTRODUCTION

Many vaccine-preventable diseases can be avoided by immunizing the mother.

Vaccination during pregnancy is an integral part of obstetric care. Pregnancy increases susceptibility to many bacterial and viral infections which lead to morbidity and mortality of both mother and fetus. Inactivated vaccines and toxoids are considered safe during pregnancy. Vaccination during pregnancy protects the mother as well as the newborn from infections as the antibodies are passed to the neonate who is protected for the first few months of life until it is time for his own vaccination.

Maternal IgG antibodies are actively transferred to fetus, mainly after 32 weeks of gestation. Hence, there is a high level of protection due to these antibodies in fetus born at term compared to preterm.

Other factors influencing the transfer of maternal IgG are placental integrity, total maternal IgG & its subtype, and timing of immunization compared to delivery.

Traditionally, vaccination was the responsibility of pediatricians and physicians. Now obstetricians have a key role to play for both the mother and neonate. Immunization history should be obtained and vaccines advised as part of antenatal care. The success of maternal and neonatal tetanus by immunization adds hope for many diseases in future.

TETANUS

- A newborn suffers from neonatal tetanus when anti-tetanus antibodies are not transferred passively from the mother.
- The infection usually spreads through unhealed umbilical stump.
- In 2006, WHO position paper on tetanus recommended three doses of diphtheria-tetanus-pertussis (DTP) vaccine in infancy, with boosters in childhood and adolescence and a sixth dose at first pregnancy. When the immunization status is unknown, the mother should receive two doses of vaccine 4 weeks apart and preferably 2 weeks before delivery.
- If a mother received two doses in her last pregnancy and conceives within 3 years, only one booster dose is recommended.
- WHO also recommends a third dose of tetanus toxoid 6 months after the second one to extend protection for at least 5 years.
- A serum antibody titer of >0.01 U/mL provides protection. The wide coverage of vaccine has been successful in elimination of maternal and neonatal tetanus in low- and middle-income countries by 94–96%.[8]
- The vaccine also prevents premature births.
- Elimination of neonatal tetanus is defined as less than one case per 1,000 live births in every district of every country. India was finally free of maternal and neonatal tetanus in 2015. Eradication of tetanus is not possible because the spores are widespread in the environment.
- If a case of neonatal tetanus is identified, the

mother should be given tetanus toxoid as early as possible and the baby to be treated as per national guidelines.

- The mother should receive second dose of toxoid 4 weeks after the first and a third dose 6 months after the second.

DIPHTHERIA

Though the disease burden has declined due to childhood vaccination, India still contributes substantially to the global scenario. India has moved toward Tetanus- Diphtheria vaccine, instead of only tetanus. In pregnancy, this will benefit both mother and the neonate against two diseases.

PERTUSSIS (WHOOPING COUGH)

The highest risk of complication and hospitalization is among the neonates who are too young to be vaccinated. Adolescents and adults act as reservoirs for disease transmission as the immunity imparted by the vaccine wanes off. Family members and caregivers transmit the infection to the baby.

Antenatal vaccination prevents pertussis in mothers and their infants by passive transfer of maternal anti-pertussis antibodies. The probability of the mother infecting her newborn is also reduced.

TETANUS DIPHTHERIA ACELLULAR PERTUSSIS (T-DAP) VACCINE

- The T-dap vaccine includes tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis.
- This provides protection against three bacterial infections—Tetanus, Diphtheria, and Pertussis. Antenatal immunization protects both the mother and the baby.
- The recommendation is to immunize all pregnant women with a single dose of T-dap in the third trimester, preferably between 27 and 36 weeks of gestation irrespective of prior Td or T-dap vaccination.[11,12] This maximizes passive transfer of antibody to the infant.
- However, it may be given at any time during pregnancy.
- This has to be repeated in every pregnancy regardless of previous immunization status as the protection against pertussis is short-lived.
- T-dap vaccine can be considered instead of the second dose of tetanus toxoid to extend protection against diphtheria and pertussis in addition to tetanus.
- However, it may be given at any time during pregnancy.
- This has to be repeated in every pregnancy regardless of previous immunization status as the protection against pertussis is short-lived.
- T-dap vaccine can be considered instead of the second dose of tetanus toxoid to extend protection against diphtheria and pertussis in addition to tetanus.
- Family members are usually the source of pertussis transmission in infants.[13] Hence, T-dap is also important for health-care professionals and any person (siblings, grandparents, child-care providers) having close contact with an infant aged less than 1 year.
- This is termed as cocooning and a good strategy against infantile pertussis.[14]
- Post-partum vaccination with T-dap, if missed during pregnancy, also offers some protection to the infant.
- T-dap is in use since 2012 in various countries like the US, the UK, Australia, and New Zealand.
- The vaccine is well tolerated in pregnancy.
- Pain and swelling at the injection site, fever, and body ache are the only side effects.

INFLUENZA IN PREGNANCY

- The virus undergoes frequent antigenic change.
- Pandemic flu can occur due to antigenic drift of its surface proteins. A 2011 Lancet meta-analysis

reports 20 million influenza-related acute lower respiratory infections.

- Pregnant women with influenza virus infection are seven times more likely to be hospitalized and four times more likely to need ICU care.
- Also there is increase in miscarriage rates, stillbirths, and early neonatal deaths.
- There is increased risk of premature and complicated birth.[2]
- The best solution for f lu prevention is immunization. The CDC recommendation is to immunize all pregnant women with inactivated influenza vaccine during flu season. There is no place for live-attenuated vaccine in pregnancy. The influenza vaccination is beneficial for both seasonal influenza and influenza pandemics.[7]
- It is recommended for mothers from 26 weeks onward and in case of pandemic, the vaccine can be given earlier to protect the mother.[14] Transfer of maternally derived antibodies occur.
- The strains included in the vaccine are selected based on epidemiologic and virological surveillance by WHO's Global Influenza Surveillance and Response System (GISRS).
- WHO monitors the evolution of viruses and recommends the viruses to be included in the vaccines twice a year (Northern and Southern hemisphere formulations). Influenza vaccine formulations change up to twice annually.

VACCINES IN PREGNANCY UNDER SPECIAL CONDITIONS

SARS-CoV-2 Vaccination in Pregnancy: A Unique Opportunity for Equity

Vaccination is highly effective in reducing the severity of COVID-19 infection, hospitalization, and death.

Table 1: Vaccines Recommended For All Pregnant Women

Vaccine	Vaccine type	Pregnancy recommendation
T-dap	Tetanus and diphtheria— inactivated toxoids; acellular pertussis— inactivated subunit	1 dose T-dap from 27 to 36 weeks, regardless of previous immunization
Tetanus Toxoid/Tetanus Diphtheria (Incomplete immunization/ unknown status)	Inactivated toxoids	2 doses 4 weeks apart (2nd dose can be T-dap)
Influenza	Inactivated viral subunit	1 dose during flu season, any gestational age
Vaccines recommended under special circumstances	Vaccines contraindicated in pregnancy	
COVID-19 (pandemic)		
Hepatitis A	Measles Mumps	
Hepatitis B	Rubella (MMR)	
Pneumococcal	Varicella	
Meningococcal	Human Papilloma	
Yellow fever	virus (HPV)	
Japanese encephalitis	Bacillus Calmette	
Typhoid	Guerin (BCG)	
Rabies		
Anthrax		

Protective antibodies are found in umbilical cord blood and breast milk which shows protection to the neonate. Vaccines available in India are:

- Covishield—produced by Serum Institute of India (SII) in collaboration with Astra-Zeneca. This is an adenovirus based viral vector vaccine.
- Covaxin—produced by Bharat Biotech Ltd. This is an indigenous vaccine and is an inactivated (killed) whole virus vaccine.
- Sputnik V

Ministry of Health and Family Welfare, Government of India, approved vaccination of pregnant women against COVID-19 on 2nd July, 2021. The dosage and side effects are similar to that of general population.

Counselling will help overcome the fear of vaccination in pregnancy.

Hepatitis A

- Hepatitis A is RNA virus and the vaccines are formalin-inactivated.
- The safety of vaccination during pregnancy is not known.
- However, due to the fact that the vaccine is inactivated, the risk to the fetus is expected to be low.
- The vaccine is indicated in special circumstances when the benefits outweigh the risks—chronic liver disease, hemophilia, intravenous drug abuse, working with primates, and travel to endemic regions.
- Finally, if exposed to Hepatitis A infection, immunoglobulin should be administered.
- It is highly effective and prevents acute infection.

Hepatitis B

- Hepatitis B is a DNA virus and the vaccine is recombinant formulation based on Hepatitis B surface antigen envelope protein.
- Three doses are highly effective in disease prevention.
- The vaccine is recommended for pregnant women who are at high risk during pregnancy.
- It is an inactivated subunit vaccine, the risks to the baby are very low.
- High-risk groups are women with multiple sex partners during the previous 6 months, those who inject drugs/partner injects drugs, regular blood transfusion, liver disease, chronic kidney disease, and women traveling to high-risk countries.[19]
- The vaccine is also advisable for women at risk of contact with body fluids like doctors, nurses, and lab staff and those who are evaluated or treated for sexually transmitted disease.
- The antibodies protect the newborn.

Meningococcal Disease

- Meningococcal disease is caused by Neisseria meningitidis, a bacterium. It has a high mortality rate, despite treatment and the survivors have significant sequelae. Two inactivated vaccines are effective against meningococcal disease—conjugate vaccine and a polysaccharide vaccine.
- The meningococcal vaccine is recommended during pregnancy to mothers at high risk for the disease.
- The risk factors[1] are living in close contact like dormitories, functional and anatomical asplenia, immunosuppression, complement deficiency and travel to high-risk endemic areas.
- The vaccine is safe during breastfeeding.

PNEUMOCOCCAL DISEASE

- Pneumococcal disease is responsible for pneumonia, bacteremia, meningitis, and otitis media.
- Thirteen-valent pneumococcal conjugate vaccine and 23-valent polysaccharide vaccines are recommended for mothers who have risk factors.
- The vaccine can be given during breastfeeding.

- The risk factors which recommend for vaccine usage are chronic heart disease, chronic lung disease, asthma, diabetes mellitus, congenital or acquired immunodeficiencies, Sickle cell disease and other hemoglobinopathies, anatomic or functional asplenia, chronic liver disease, smoking, alcoholism, cirrhosis of liver, and chronic renal failure.[15]

TRAVEL VACCINATIONS

International travel is increasing, and the speciality of travel medicine is emerging to protect the health of travelers through the use of immunization and appropriate drugs. Pregnant women planning international travel need to fulfill country-specific recommendations. The vaccine-preventable diseases encountered are Yellow fever, Japanese encephalitis, and typhoid fever.

YELLOW FEVER

Yellow fever is caused by an RNA flavivirus and is spread by mosquitoes. The disease spectrum varies from mild-to-severe symptoms which include multi- organ failure, hemorrhage, and death. The disease is endemic in South America and sub-Saharan Africa.

Yellow fever vaccine is live attenuated. It is safe and effective.

CDC recommends vaccination during pregnancy if her risk of exposure and infection is high and the advantages outweigh the risks of vaccine.

Non-pregnant women of reproductive age group are advised to avoid conception for 4 weeks post-vaccination. In countries where Yellow fever vaccine is an entry requirement but the disease is not endemic, pregnancy constitutes medical grounds for exemption from the vaccination requirement.

JAPANESE ENCEPHALITIS

Japanese encephalitis is also caused by RNA flavivirus and spread by mosquitoes. The disease is prevalent in Asia. The mortality rate is high and the survivors have neurocognitive and psychiatric sequelae. CDC recommends inactivated Japanese encephalitis vaccine for pregnant women planning longer duration travel to endemic areas, where immunization is more beneficial compared to the risk of infection.

TYPHOID FEVER

Two vaccines are available–a live-attenuated vaccine and a polysaccharide vaccine. In cases of travel to endemic areas, the inactive parenteral vaccine may be administered.

RABIES

Rabies is caused by Rhabdovirus and the infection is spread through saliva or central nervous system tissue of an infected animal. The disease is fatal to both mother and baby.

Pre-exposure prophylaxis is advised if risk of exposure is high. Inactivated rabies vaccine is available.

CDC recommends post-exposure prophylaxis to any pregnant woman after a moderate or high-risk exposure to rabies. This includes rabies vaccine and human rabies immunoglobulin.

ANTHRAX

Anthrax is caused by Bacillus anthracis, a spore-forming bacterium. The spores can be aerosolized and remain viable for long periods and considered a deadly biological weapon. Pre-exposure vaccination is not advised during pregnancy. However, post-exposure vaccination with inactivated subunit should be recommended with anthrax exposure.

VACCINES CONTRAINDICATED DURING PREGNANCY

Live-attenuated vaccines are contraindicated during pregnancy. The virus can cross the placenta and infect the fetus.

MEASLES MUMPS RUBELLA (MMR)

Measles and Mumps are both caused by

paramyxovirus and Rubella by togavirus. The disease burden has decreased with childhood vaccination and adult booster dosing. The vaccine is live attenuated and possible teratogenic effects of vaccine on fetus exists.[1] This is not advisable during pregnancy. Hence, pregnancy status should be ruled out in women of child-bearing age before vaccination.

They must be advised contraception for 1 month post- vaccination.[22] Accidental administration of MMR vaccine, however, does not call for termination of pregnancy as no evidence of harm has been documented so far. Preconception screening and MMR administration are advised to avoid congenital rubella syndrome in her subsequent pregnancy. A single dose of vaccine produces antibody levels in 95% of susceptible persons.

Pregnant women who are susceptible to Rubella are vaccinated postpartum as it eliminates risk of future pregnancies. The virus is excreted in breast milk and causes seroconversion and asymptomatic infection is reported in the neonate.

VARICELLA

Varicella is caused by Varicella zoster virus of the herpes family. Pregnant women are usually immune to infection and have protective antibodies. Maternal Varicella zoster virus infection is seen in 2–3 cases per 1,000 pregnancies.[23] Varicella immunization is not recommended during pregnancy as the virus can harm the fetus. However, accidental administration during pregnancy does not call for termination.

Pre-pregnancy and postpartum period should be utilized to vaccinate all non- immune women. In case of a possible exposure to Varicella in antenatal period, the immunity should be checked by history of previous infection, immunization, or immunoglobulin G serology.

If immune status is not known and the serum status is negative, varicella zoster immunoglobulin should be administered as soon as exposure occurs.

The patient and family must understand the maternal and fetal sequelae of varicella infection and the risk of transmission.

HUMAN PAPILLOMA VIRUS(HPV)

HPV is a small DNA virus and the vaccine is L1 major capsid protein of HPV which form virus-like particles. The vaccine is not recommended during pregnancy and conception is avoided for 1 month post-vaccination. However, if a vaccine series is started and then pregnancy is confirmed, vaccination should be delayed and completed after delivery.

BACILLUS CALMETTE GUERIN(BCG)

BCG vaccination should not be given during pregnancy as it is a live vaccine and can harm the fetus.

BREASTFEEDING AND POSTNATAL VACCINATION

For breastfeeding mothers, almost all vaccines (inactivated, live, recombinant, subunit, conjugated vaccines, and toxoids) can be safely administered. Rubella, Hepatitis B, Varicella, Influenza, Tetanus, and HPV vaccinations are advised to all non-immunized postnatal mothers by FOGSI.

Yellow fever vaccination should be avoided but if travel cannot be postponed to endemic areas, vaccination should not be withheld.

VACCINES—SIDE EFFECTS AND CONTRAINDICATIONS

The side effects of vaccine are as follows:

- Immediate effects can be fainting and vasovagal reactions. Patients are usually advised to wait for 15–30 minutes after receiving a vaccine
- Local effects include erythema and swelling (most common)
- Systemic effects can be malaise and fever

- Mild allergic reactions. This may happen with Yellow fever and influenza vaccine due to egg proteins

Anaphylactic reactions are very rare and should be treated immediately. General contraindications are:

- Anaphylaxis to a vaccine or vaccine component
- Severe asthma
- History of Guillain Barre Syndrome (GBS) within 6 months of receiving a vaccine

FUTURE

Vaccines are beneficial during pregnancy in various stages of research and development. Two examples are Group B Streptococcus (GBS) and Respiratory syncytial virus.[8,24] Group B Streptococcus is the leading cause of neonatal sepsis and meningitis and the vaccine would be effective in preventing both early and late-onset disease. A polysaccharide conjugate vaccine of GBS is in clinical trials in Europe and Africa. Respiratory syncytial virus causes bronchiolitis and pneumonia in infants and the vaccine would prevent hospitalization and infant mortality due to the disease. The infant will get protection during the first few months of life due to antibody transfer from the mother.

Other potential vaccines targeting Cytomegalovirus, Herpes Simplex virus, and Zika virus will have promising results in future.[25]

OVERCOMING THE BARRIERS

Vaccination during pregnancy raises lots of questions in the minds of the mother and the family regarding the safety concerns, particularly related to the fetus. Other barriers to antenatal vaccination include patients' misconceptions, complexity of the immunization schedules, religious beliefs, and cost.[21] These anxieties and hesitation should be addressed by providing adequate information to the family.

The supportive recommendation from the health-care provider increases acceptance of the vaccine to the extent of 20–100 times. Various surveys have confirmed that the obstetrician plays an important role in the decision-making and in overcoming the barriers and building this confidence. To overcome maternal immunization hesitancy, educational activities should target health-care workers and government officials also along with mothers and their families. The vaccines with proven benefits like T-dap and influenza should be added to national immunization schedule.

In developing countries like India, where cost of vaccine is a barrier, the government should include these in routine immunization programs.

CONCLUSION

- Single dose of Tdap vaccine is recommended in the third trimester, preferably between 27 and 36 weeks of gestation irrespective of prior Td or Tdap vaccination.
- All pregnant women should be immunized with inactivated influenza vaccine during flu season at any gestational age, preferably from 26 weeks onwards.
- COVID-19 vaccination is suggested in pregnancy and lactation with dosing similar to general population (present pandemic).
- Women with risk factors and travel needs can be vaccinated with hepatitis A, hepatitis B, pneumococcal, meningococcal, Japanese encephalitis, yellow fever, typhoid, rabies, and anthrax vaccines.
- Women who have inadvertently received a live or live-attenuated vaccine during pregnancy should not be counseled for termination in view of teratogenic risks. Non- pregnant women receiving these vaccines should be advised to delay pregnancy for 4 weeks.

MOGS Word Puzzle

Dr. Darshana Ajmera & Dr. Juili Tadkar

Name: _____ Date: _____

OB/GYN

D F O C F G C X T A E Z M C H T J
P R E G N A N C Y A T Y P I C A L
G W P L A C I V R E C O D N E H Z
F Z U C E R V I C A L J J R O N U
P P R E K T D S G E S T A T I O N
A E X F O L I A T E D T F V W A S
P N F O X T Y T Q Y G O L O T Y C
A P T F M Z C P S I T I N I G A V
N P A E U F V V G W H B R L Y M H
I Q L C V L Q C Q R G E L G F Q M
C U D H Y H H E Z A M A L O S M P
O E P E R P N I H T M N W I M G B
L U Y X U A N G M L A T A N E R P
A Y A V E L U R S E L E G E A N B
O T R I M E S T E R M D F T E S C
U T S W T Z S U D N U F L N B S A
C J P B A M D D O U C H E Q H J Q

vaginitis
pregnancy
gestation
douche
trimester
Papanicolaou
fundus
cytology
ThinPrep
Naegele's rule
exfoliated
cervical
prenatal
Lamaze
endocervical
atypical

Report of MOGS CME on Optimising Labour in association with AMWI on Occasion of World Health Day held on 11th April 2023 at GCC Club, Mira Bhayender

An MOGS CME in association with AMWI on Optimising Labour was held on Tuesday, 11/04/2023 between 7 pm – 10 pm at GCC Club, Mira Bhayender. The event was supported by Meyer and was attended by about 42 gynecologists. The program conveners were Dr. Mandakini Megh, Dr. Komal Chavan and Dr. Navneet Desai. The co-onveners were Dr. Riddhi Desai, Dr. Pradnya Supe, Dr. Jagruti Ghosh and Dr. Rajendra Nagarkatti. The MOCs and Co-ordinators were Dr. Rajashri Tayshete, Dr. Sarita Channawar and Dr. Uzma Shaikh.

Dr. Rajashri Tayshete, one of the co-ordinators, welcomed the delegates and the faculty and thanked the MOGS for the opportunity to conduct this event.Our Chairpersons for the first lecture were Dr. Shravan Desai Dr. Mangala Patil and Dr. Priya Vora. The speaker was Dr. Riddhi Desai, who spoke on Management of perieal tears. Our Chairpersons for the second lecture were Dr. S.N Agarwal, Dr. Rajendra Nagarkatti and Dr. Punit Bhojani. The speaker was Dr. Mandakini Megh who spoke on Rising rates of Caesarean Section – a challenge.

Our Chairpersons for the third lecture were Dr. Pratik Tambe Dr. Pradnya Supe and Dr. Priti Sharma. The speaker was Dr. Komal Chavan, who spoke on Nutrition in Pregnancy. Our Chairpersons for the fourth lecture were Dr. Vipin Checker Dr. Lila Agarwal and Dr. Asha Nagarkatti. The speaker was Dr. Maya Prasad, who spoke on Updates in Instrumental Delivery.These lectures were followed by a video message from our MOGS President Dr. Niranjan Chavan who spoke on the various forthcoming events and multiple unique initiatives launched during the MOGS year.

The case-based panel discussion on PPH – Predict Prepar and Handle was ably moderated by Dr.Navneet Desai and Dr. Vaidehi Thakur using a variety of clinical scenarios. The panelists included Drs Sanjay Shah, Punit Bhojani, Jagruti Ghosh,

Rajashri Tayshete, Sarita Channawar, Uzma Sheikh and Shree Ram Iyer all of whom gave clear take-home messages to the audience.

The program concluded with a Vote of Thanks proposed by Dr. Sarita Channawar The academic content and wide variety of topics were much appreciated by the audience. Amazing evidence-based talks, participation from senior MOGS members, and contagious enthusiasm by MOGS Managing and Youth Council members were the highlights of this event. Despite it being conducted on a weekday we had an excellent audience.

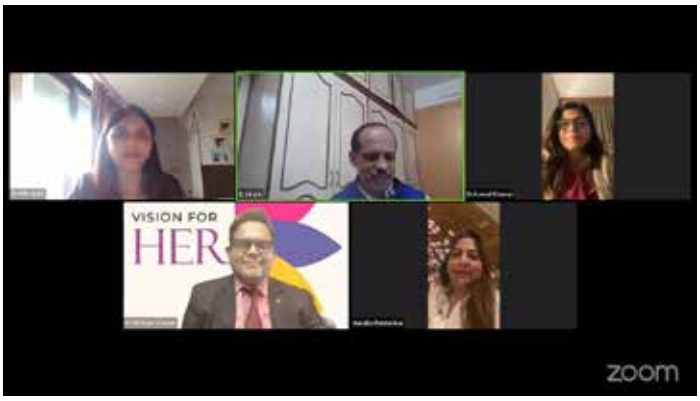
Report of MOGS – Dr. Nandita Palshetkar postgraduate CME 2023 Phase I – 7th – 9th April 2023 & Phase II – 15th – 16th April 2023

Mumbai Obstetrics and Gynecological Society conducted MOGS – Dr. Nandita Palshetkar postgraduate CME 2023 in two Phases. First Phase on 7th - 9th April 2023 and Second Phase on 15th – 16th April 2023 on online platform. Conveners were Dr Madhuri Mehendale, Dr. Mansi Medhekar, Dr. Priti Vyas, Dr. Komal Chavan and Dr. Pradnya Supe & Dr. Punit Bhojani. Inauguration of the programme was held on 7th April 2023. Dr. Niranjan Chavan, President MOGS, Dr. Rajendra Sankpal, Secretary MOGS and Dr. Geeta Balsarkar ,Treasurer MOGS graced the occasion. Five days extensive academic sessions were held. 450 postgraduates from across India registered for the CME. 120 faculty from different teaching institutes participated in this mega event.

MMC granted us 4 +4 credit points and 20 ICOG points.

Highlights of CME were 28 long case discussions, short cases, ward round sessions ,table-viva sessions, Instruments, Specimens, XRays, CTGs, Drugs, Fetal Skull and Pelvis, Spots. Students and faculty gave positive feedbacks in terms of content, conduct and time management of CME.

We the conveners thank Dr. Niranjan Chavan, President MOGS ;Dr. Rajendra Sankpal, Secretary MOGS and Dr. Geeta Balsarkar ,Treasurer MOGS for giving us this opportunity .We thank onference team and MOGS office staff for actively helping us in this programme.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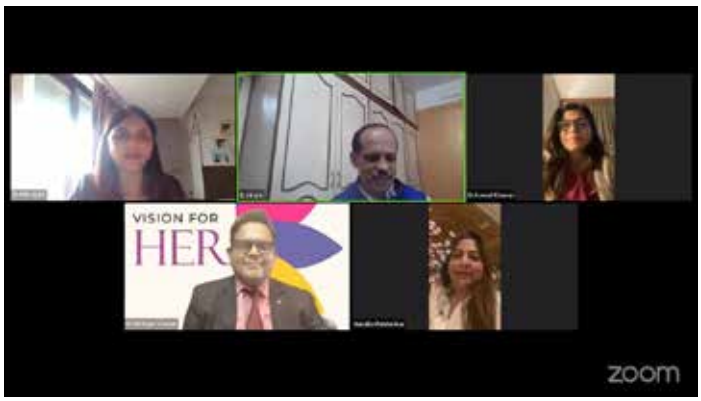
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MOGS- Dr. Nandita Palshetkar Postgraduate CME 2023
Dr. Nandita Palshetkar
Director of 9 bloom IVF centres has more than 25 years of experience in IVF practice and treated thousands of couples. She has been a pioneer in the field of infertility in the last three decades and introduced various technologies for the 1st time in our country like Assisted Laser Hatching, IMSI, Embryo scope, Egg banking etc
Her IVF centres are in Lilavati hospital, Mumbai, Fortis hospital Delhi, Gurgaon, Bangalore, Mohali, D Y Patil Hospital Navi Mumbai, Sakra Hospital Bangalore.
President, AMOGS
Chairman of Maharashtra Chapter of the Indian Society of Assisted Reproduction.
Past President FOGSI, MOGS, IAGE
Vice president of Federation of Obstetrics and Gynaecology India 2013.
She has given more than 700 talks, contributed > 100 chapters and papers edited 8 books and delivered more than 20 orations.
She has received numerous awards for the exemplary work in the field of women health
She is working with the police families to uplift their health and also with adolescent girls of Mumbai for their empowerment.
She has started the programme She's Ambassador with the underprivileged girls of Mumbai to instil leadership qualities & make them the ambassadors of good healthy in their communities.
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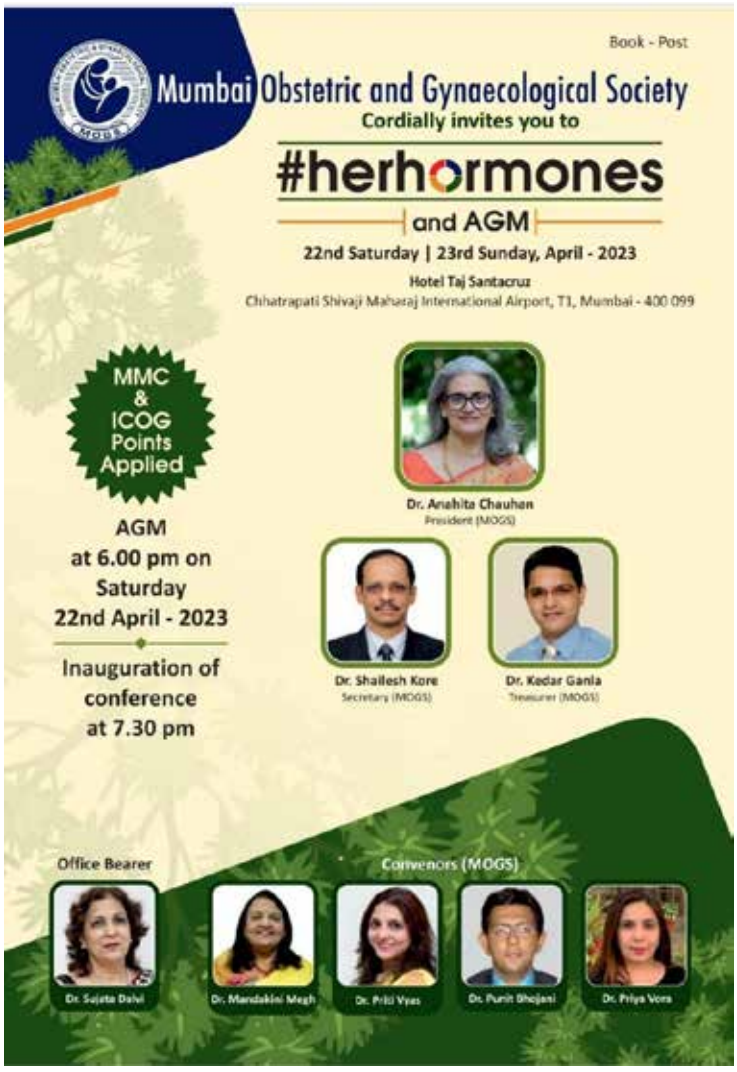
MOGS Upcoming Event



Soduku (Answer Keys)

5	3	1	6	9	4	2	8	7
2	8	6	1	7	5	9	3	4
7	4	9	3	2	8	5	6	1
8	7	3	4	6	2	1	9	5
6	2	5	9	3	1	7	4	8
1	9	4	8	5	7	6	2	3
9	1	2	7	4	3	8	5	6
3	6	7	5	8	9	4	1	2
4	5	8	2	1	6	3	7	9

MOGS Learn With Fun (Answer Key)

Q & A:

1. d
2. d
3. d
4. b
5. d

Annual Photo Shoot of MOGS Trustees & Past Presidents with President, Secretary, OB, MC members of Team MOGS (2022-2023) with Felicitation of Past President MOGS (2017-2018) Dr Vanita Raut on 19th April 2023









Dr. S N Daftary Past President MOGS & FOGSI & Dr. Deepak Dave Past President of MOGS felicitated with MOGS Global Excellence Award 2022-2023.

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