



The Newsletter
EXPRESS

Issue 2, 2024

DECEMBER 2024

**A MEMOIR OF ENDOMETRIOSIS
in my Professional Journey**

**"Awakening the Dormant:
Revitalizing Male Infertility
Evaluation and Treatment
with Scientific Wisdom"**

Probiotics in Infertility



29th Annual Conference of Indian Society for Assisted Reproduction

7th - 8th - 9th February 2025

Indira Gandhi Pratishthan Lucknow

BRIDGING GAPS IN INFERTILITY-THE QUEST CONTINUES

CONFERENCE HIGHLIGHTS

4 Orations

20 Symposiums

13 Workshops

15 Keynote Sessions

Faculty from ESHRE, ASRM, ASPIRE, IFFS, Egyptian Fertility and Sterility Society



Dr. Ameet Patki
President, ISAR



Dr. Chandravati
Patron



Dr. Meera Agnihotri
Organizing Chairperson



Dr. Asha Baxi
Hon. Secretary General

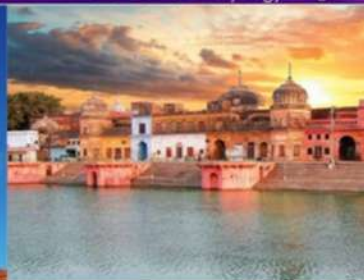


Dr. Charudutt Joshi
Chairman of Embryology



Dr. Rajul Tyagi
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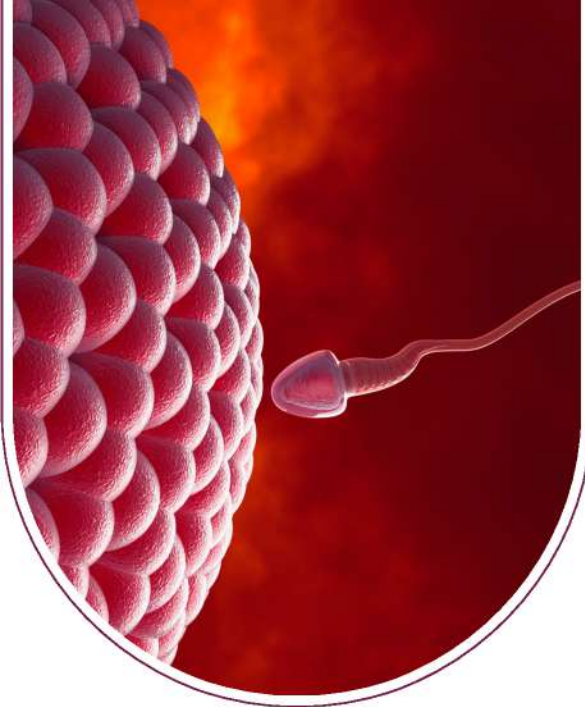


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From the **President's Desk**



Dear ISARians,

Welcome to the second issue for the year. We have had a great response and feedback for the first and me and my team are thankful to you.

Our theme for the year "Empowering Parenthood...Every pregnancy matters" embodies all that we do for our patients. Helping them to be parents. In the infertility struggle we at ISAR have identified certain areas of treatment and management which are slightly grey, no clear cut guidelines. Hence we decided to conduct closed group Masterclass in 5 such areas, namely Probiotics in Gynaecology, PCOS and POR, RPL and male infertility.

We have had an overwhelming response to all the masterclass and as President I think this has been the highlight of the year.

We had 2 excellent regional conferences in Shirdi (West) and Bangalore (South). Dr. Prerna Shinde with Maharashtra Chapter and Dr. Manjunath with Karnataka chapter did a great job. The ISAR ASPIRE regional conference at Pune saw a large attendance and I must thank Dr Sunita Tandulwadkar from ISAR and ASPIRE President Dr. Clare Boothroyd for all their support.

The ISAR embryology conference at Chandigarh under the Chandigarh chapter led by Dr Nirmal Bhasin and the ISAR Yuva conference by the Bihar chapter led by Dr Pragya Mishra saw a large number of embryologists and our young members displaying great knowledge and oratory skills. I must congratulate GenX for their hard work, passion and dedication.

Fusion2024 was a perfect amalgamation of ISAR IFS ESHRE and an example of how collaborative efforts magnify the output. Dr.Rishma Pai from ISAR spearheaded the event to a great success.

We have had a large number of online courses, meetings and lectures to provide the latest from world over.

We now look forward to the annual ISAR conference at Lucknow 7-9 Feb 2025. This is truly a melting pot of knowledge, fellowship, food and fun. I invite you all to the most sought after meeting. I would love to meet you all there. Till then.....

Dr. Ameet Patki

President, ISAR 2024-26



From the **Editor's Desk**

Dear readers,

I am very pleased to invite you to this edition of our ISAR journal. As part of the ISAR commitment to creating knowledge and sharing advancements in the field of assisted reproduction, we have compiled a set of very knowledgeable articles by our distinguished members.

In this edition, we bring before you three very interesting articles. The first one is an article by Dr. KK Gopinathan, an very senior consultant with vast experience. He delves deeply into the years in management and treatment for endometriosis hence providing critical insights for any practitioner, whether new in practice or long-serving. The second article is in the hands of Dr. Raju Nair, who delves into a very crucial issue on male fertility. He engages in the approaches that should be taken upon the evaluation and the stated management, thus unveiling the aspect of fertility in reproduction that is always under wraps. The third article has been contributed by Dr. Neharika Malhotra and deals with a very focused study of the effect of probiotics in infertility. Her work will be a fresh addition to the enormous knowledge about treatments for this problem.

Pursuing our "Know Your Team" initiative, this month we feature our General Secretary, Dr. Asha Baxi. This will help you get introduced to the people working behind the curtain to carry forward the vision of our society.

An Inside View This issue also contains a full listing of the newly elected chairpersons and secretaries of the various ISAR chapters. We congratulate them and look forward to their contributions in the year ahead. As always, ISAR is dedicated to upholding the highest standards of scientific content at our programs, publications, and training events.

We trust this issue will be both informative and inspiring to you. I would like to put on record my sincere appreciation to Dr. Ameet Patki, President of ISAR, and Dr. Asha Baxi, Secretary of ISAR, for supporting us through all our efforts. Special thanks also go to our contributors for their wonderful articles and to our publishers for bringing out this journal.

Do share your ideas for the future issues with us so we may serve you better, and we will also be expecting your active participation in our forthcoming events.

Best Regards,

Dr. Parasuram Gopinath
Editor

Meet the Team



Dr. Asha Baxi

Dr. Asha Baxi's remarkable journey from Indore, India, to becoming a pioneer in Obstetrics and Gynecology is a testament to her resilience, dedication, and unwavering commitment to improving healthcare. Born as the youngest and only daughter among three brothers, she faced early challenges when her father, a film distributor, passed away during her eighth grade. However, her mother's determination ensured that Dr. Baxi and her siblings received a solid education, setting the foundation for her illustrious career.

Dr. Baxi pursued her MBBS and MS in Obstetrics and Gynecology from MGM Medical College in Indore, where she excelled academically. Following her marriage to Dr. Anil Baxi, a vascular surgeon who later completed his FRCS, the couple moved abroad. There, Dr. Asha Baxi earned her MRCOG in 1993 and her FRCOG in 2007. Despite the challenges of studying and working in a foreign country, her commitment to learning and professional growth remained steadfast.

Dr. Baxi's path to becoming a renowned obstetrician and gynecologist was not without obstacles. After securing the highest marks in her MS, she moved to Mumbai and worked as a Registrar at Breach Candy Hospital. Here, she gained invaluable experience under the mentorship of distinguished doctors like Dr. Motasha, Dr. Soonawala, and Dr. Sadhana Desai. Financial constraints led her to Saudi Arabia, where she gained experience in high-risk obstetrics and passed MRCOG part 1. She then joined Northampton General Hospital in London, where she learned advanced hysteroscopic and laparoscopic surgeries under Mr. Edward Shaxted. She then trained for IVF at Northampton, Oxford and at Bourne Hall Clinic with Dr. Roy Davies.

Upon returning to Indore, Dr. Baxi initiated a modern era in Obstetrics and Gynecology by introducing vaginal, laparoscopic and hysteroscopic surgery in 1994.

In 1998, Dr. Baxi along with her husband Dr Anil Baxi, founded the Disha Fertility and Surgical Center, a pioneering institution offering Test Tube Baby services in Madhya Pradesh and Indore. The center became a beacon of hope for countless couples facing infertility issues. Under her leadership, the center set records with the first ICSI baby, TESA, ICSI and Micro TESA ICSI in the region. Dr. Baxi along with her husband constructed their dream hospital, which is now run by Motherhood Group of Hospitals, where she is the lead consultant and runs her IVF centre par excellence

Dr. Baxi is committed to training the next generation of medical professionals. She conducts certificate courses in Infertility and Gynec Endoscopy at her center, which are affiliated with FOGSI and ICOG. Her dedication to education extends to organizing national and international conferences, such as her role as Organizing Chairperson for ISAR 2016 and FOGSI's 2022 Annual Conference done shortly after the COVID-19 pandemic, managing to put up an excellent show and spread outstanding academics.

Dr. Asha Baxi

Her organizational skills have been showcased through numerous other conferences, such as Star Endogyn 2019, ICCON 2017 and as the Joint Organizing Secretary of IFFS 2016.

Dr. Baxi holds several key positions that highlight her leadership and expertise. She is the Secretary of ISAR, a Member of the Executive Committee AICCRCOG West Zone, Founder Chairperson of MP IAGE & MP ISAR, and a Member of the Advisory Committee PCPNDT Indore. Her past positions include Chairperson of the FOGSI Infertility Committee, Member of the ICOG Governing Council, and Vice President 2022 West Zone FOGSI. Recently, Dr. Baxi was appointed as a member of the Ultrasound Committee of Asia Oceana Federation of Obstetricians and Gynaecologists as a FOGSI representative. She successfully served as the Vice President for the West Zone of FOGSI

Dr. Baxi's contributions to Obstetrics and Gynecology have been widely recognized. She has received several awards, including the Dr. Kumud Tamaskar Award, the best paper in the FOGSI journal, the Padmashree Dr. S.K. Mukherjee Award, and the Excellence Award from Dainik Bhaskar.

Dr. Baxi's family has been a pillar of support throughout her career. Her husband, Dr. Anil Baxi, has been instrumental in her professional journey. Their son, Dr. Dhaval Baxi, is an MCh in reproductive medicine and surgery and is a nationally renowned gynaecological laparoscopic surgeon, while their daughter-in-law Dr Sonam Baxi is also a popular obstetrician. Her daughter, Dr. Hina, and son-in-law, Dr. Onkar Deshmukh, are ENT specialists. The family's three granddaughters bring joy and serve as stress busters, balancing Dr. Baxi's demanding professional life with personal happiness.



Her ability to balance personal and professional life is remarkable, and she takes pride in her hobbies, which include yoga and kickboxing. She was also a table tennis champion in school and college, showcasing her versatility and dedication.

Dr. Baxi stands as an epitome of kindness, excellence, and dedication, leaving an indelible mark on the field of Obstetrics and Gynecology.

ISAR Executive Committee 2024-26



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President



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Hon. Secretary General



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Dr. Manjunath Swamy



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Late Dr Mahendra N Parikh

Past President

Dr Prakash Trivedi

Dr Jaideep Malhotra

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Dr Manish Banker

Dr Dhiraj Gada

Dr Sadhana Desai

Dr Kamini Rao

Dr Firuza Parikh

Late Dr Mehroo Hansotia

A Memoir of Endometriosis – in my Professional Journey

Dr K K Gopinathan MD DGO

Chairman & HOD (Dept Of Obg),
Cimar – The Women’s Hospital, A Unit of Edappal Hospitals Pvt Ltd



Endometriosis as a disease has undergone a revolutionary change with regards to its understanding, pathophysiology, diagnostic modalities and various treatment techniques for over several decades.

I have essentially witnessed the science behind endometriosis unfold over the years during my professional journey. The approach to endometriosis has been intangible until now unlike other conditions such as fibroid.

The History!

Let us begin with Rokintansky! In 1860, he was the first to describe adenomyosis. (peritoneal, extra peritoneal, deep infiltrating, ovarian endometrioma and adenomyosis were commonly coined as “adenomyoma.”)

In the late 18th and the early 19th century, endometriosis was diagnosed clinically with symptoms of dysmenorrhea. At the same time, it was distinguished as a separate entity from adenomyosis which is only limited to the uterine myometrium.

Jeffcoate made a new discovery that development of endometriosis was mainly due to excessive estrogen secreted by the ovaries.

Clinicians and researchers came up with 3 important hypotheses for endometriosis... Ectopic endometrial tissue is detected in female fetuses, and it could be due to defective embryogenesis. The other oldest concept, in-situ development of endometriosis may occur from metaplasia of coelomic or peritoneal tissue. This metaplastic theory was postulated by Meyer in 1919.

Sampson in 1921 presented the implantation theory by retrograde menstruation and subsequent formation of areas of endometriotic implants.

Supporting the above theory, immunological theory was proposed. Normally, menstrual blood collected by retrograde menstruation is cleared via phagocytosis. Due to impaired immune system this blood isn’t cleared and persists as areas of endometriotic implants.

Having mentioned the various hypothetical theories, endometriosis is still a theorem of dynamic research.

The Late 18th and the Early 19th Century

The early diagnosis of endometriosis was one of the most difficult problems encountered during this time. In the 18th century Ruysch and Schrön closely observed the symptoms and signs such as progressive dysmenorrhea, dyspareunia and the presence of pelvic nodules on per vaginal examination. These were thought to be unique to the disease.

The Scottish physician Arthur Duff studied the inflammation of the uterus and its effects. He found an interesting correlation between physical symptoms of uterine inflammation and psychological symptoms of hysteria such as disturbed bladder and bowel habits, vague back pain and called these symptoms of hysteria as endometriosis.

As it was known that endometriosis was mainly due to excessive estrogen by the ovaries, androgen which counter acts estrogen was suggested as a potential antidote for endometriosis by Geist and Salmon.

In continued search of medical cure for the same, in 1957, John Rock and George Pincus used hormonal contraceptives as a promising cure for endometriosis as they closely observed regression of endometriosis in the last trimester of pregnancy.

Surgery was limited to laparotomy and hysterectomy. Whenever possible, visualization by laparotomy and histopathological examination of the excised biopsy tissue was done which was considered the standard surgical approach. The nidus for the disease per se 'ovaries' were left behind due to the paucity in understanding the disease. Conservative surgical approach slowly became popular, where only the endometriotic tissue was excised leaving behind the ovaries and the uterus.

The Decade of Pelviscopy! 1970-1980

Looking inside the pelvic cavity, without having to open the abdomen was an impetus to new discoveries. Diagnostic pelviscopy was first popularized in India by Motashaw from Bombay in 1970s. Soon, pelviscopy was considered as the primary diagnostic modality worldwide, especially in India.

Parallely, there was a rise of surgeons who stuck a feather in their hats as well-known laparoscopists! They fine-tuned their skills by performing many laparoscopic surgeries on all patients having dysmenorrhea. They even assured a cent percent cure rate which was beyond contrary to reason as we presently know that there is a possibility of 100 percent recurrence post-surgery.

Many women presented with pain. For them, a simple analgesic like NSAID (anti prostaglandin) taken during menstruation provided good pain relief.

Oral drugs like Norethisterone (one of the first progestins) became afoot for the medical management. It was used to induce anovulation and pseudocyesis on daily consumption for 9 months. Other progestins like medroxy progesterone acetate, cyproterone acetate, norgestrel, levo-norgestrel, megestrol had a short-lived popularity as they caused irregular bleeding.

After a while, Danazol, a synthetic androgenic progestogen became a beloved medicine among many. It was taken from the first day of the cycle every-day and prompt development of amenorrhea was the only evidence of its adequate clinical response. It led to ovarian suppression. Patients complained of menopausal symptoms like hot flushes, night sweats and mood changes. Another unacceptable side effect was androgenic manifestations like weight gain, acne, hirsutism, voice change and hence, it was devalued fleetly by the professionals.

As NET and Danazole, were taken down, the only way of curbing symptoms, was by excising the lesions through laparoscopy. Hence, laparoscopy advanced itself as a therapeutic treatment option.

In search of promising medical treatment, low dose OCPs gained importance.

In the race for a relevant management, there was still scope for improvement towards the end of this decade.

Golden Decade - The Invention of Pelvic Ultrasound (1980-1990)

Being able to recognize a condition on a monitor by scanning, without having to do a surgery, was a breakthrough! Ultrasound became an invaluable tool to diagnose many pathologies among various medical specialties.

In late 1980's the monumental invention of transvaginal sonography with 5MHZ transducer became a promising tool to determine ovarian endometrioma. MRI aided in the diagnosis. Hence, laparoscopy was no longer needed to diagnose pelvic endometriosis. Peritoneal and extra peritoneal endometriosis could be picked up through MRI, and probably needed a laparoscopic inspection with histopathological confirmation to diagnose extensive peritoneal endometriosis.

Some newer hormonal agents like GnRh agonists & Gestrinone were just released in the market during this time. The idea of suppressing the ovaries by GnRh agonist germinated between 1982 and 1984 by Meldrum. He coined the term medical oophorectomy to refer to the effect of GnRh agonists. Main drawbacks were, decrease in bone mass on long term GnRh agonist treatment, recurrence following discontinuation and the need for add back therapy. Gestrinone was introduced in the treatment of endometriosis by Coutinho in 1982. It lost its importance due to androgenic side effects and prompt recurrence of symptoms after discontinuation of treatment.

The surgical approach for endometriosis underwent a major revolution during this time, in favor of laparoscopy and laparotomy became obsolete. It gained superiority in terms of simplicity and patient convenience over the conventional laparotomies. Laparotomy was limited to those with severe degree endometriosis who couldn't be safely operated by laparoscopy. LASER vaporization and electro coagulation gained popularity too.

In 1986, Nezhat demonstrated LASERS (CO₂, Argon, ND-YAG) as safe and effective for laparoscopic treatment of endometriosis. Advantages of LASER Laparoscopy over conventional operative laparoscopy is the precise destruction of tissue, minimal bleeding and thermal damage to adjacent tissues. Major drawbacks were the need for protective eye wear and difficulty in maintaining the pneumoperitoneum.

Electro-excision of endometriosis through laparoscopy resulted in prompt and durable relief of pain. Various therapeutic surgical procedures done were adhesiolysis, ablation & excision of implants, salpingo ovariectomy. It was ultimately realized that unless bilateral oophorectomy is done recurrence is 100 percent in most of the cases.

Conservative surgeries like presacral neurectomy and laparoscopic uterine nerve ablation for pain relief were introduced in late 1980's but they are not widely accepted.

The Reign of Laparoscopy (1990-2000)


As the advancement in transvaginal ultrasound with color doppler, a non-invasive means of diagnosing pelvic endometriosis became popular, all started to use it extensively and diagnostic laparoscopy became obsolete.

During this decade laparoscopy was considered as the gold standard therapeutic approach for the management of endometriosis.

In late 1980's they identified levels of CA125 to be raised in patient with endometriosis, and was thought to have a prognostic value during serial evaluation of patients.

Newer drugs introduced during this decade were antiprogestosterone Mifepristone and Aromatase inhibitors.

Mifepristone (RU486), in 1996 was used in the management of endometriosis. The dose was 50mg per day for 9 months. This drug didn't show favorable clinical effects and lost its role.



Studies showed that endometriotic implants synthesize estrogen locally due to increase in the aromatase enzyme. Hence, third generation aromatase inhibitors (letrozole, anastrozole) were proposed for the treatment in the late 1990s. Due to recurrence of symptoms and safety of long-term administration, aromatase inhibitors lost their importance.

Digging the deep endometriosis in the 20th century!

Substantial progress in diagnostic imaging (TVS, CT Scan, MRI) has allowed a reliable noninvasive diagnosis of deep infiltrating endometriosis (DIE). Many newer drugs were introduced for the same.

Levonorgestrel intrauterine system (mirena) provided significant reduction in dysmenorrhoea, pelvic pain, deep dyspareunia and size of endometriotic implants especially on the rectovaginal septum.

3 monthly injection of Depot medroxy progesterone is a good option, but long-term use caused bone loss, hence was not considered the first line of management.

Oral progestin, dienogest induced hypo estrogenic, hypergestagenic local environment causing atrophy of endometriotic lesions. Dosage is 2 mg oral daily for 6 months. This has shown a proven benefit among many patients having pain.


Anti-oxidants like melatonin are used even today, in the treatment of endometriosis to prevent disease progression. Use of GnRH antagonists has been FDA approved in the treatment of endometriosis. Immunomodulators, anti TNF inhibitors like INFLIXIMAB has been introduced. There is not enough evidence to support its use. Neo-angiogenesis is essential for initiation, growth and recurrence of endometriosis. Drugs like statins, dopamine agonists like cabergoline, quinagolide have been accepted as a potential treatment options.

The recent advent of robotic laparoscopy is a classic innovation providing new dimensions for the treatment, especially for deep infiltrating endometriosis. Long operating hours and huge cost are the major drawback.

Endometriosis can influence fertility in several ways causing distortion of pelvic anatomy, adhesions, fixed fallopian tube, altered immune system, decreased ovarian reserve, altered oocyte quality, impaired implantation and pregnancy.

During this decade, Assisted Reproductive Techniques gained popularity to help women conceive who have had extensive pelvic adhesions or in whom there was additional male factor infertility.

None of the currently available treatments can prevent or cure endometriosis. Treatment is aimed mainly at improving fertility and relieving pain. Most appropriate treatment for a couple will depend on number of parameters including couple's age, duration of infertility, ovarian reserve, semen analysis, sexual dysfunction etc. Surgical treatment should be reserved for women in whom surgery can restore the tubo ovarian anatomy and hence, the couple can conceive normally after the surgery.






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To Conclude...

We know that endometriosis, though a disease of theories, is a global health problem among majority women. In olden days, this was a disease of social stigma and there was no adequate facilities or advanced science to diagnose the same. As time passed, during my early days of practice, this mysterious entity was diagnosed mainly by clinical symptoms of severe dysmenorrhea and dyspareunia. Surgeons then confirmed the same by doing an open laparotomy. Sometimes the main treatment was to knock the uterus, considering it to be the seat of dysmenorrhea.

Later came the pragmatic advent of laparoscopy, that facilitated easy visualization of pelvic structures. Soon, it became a standard diagnostic tool worldwide.

After a decade in trying to demystify the science behind endometriosis, medical field witnessed the invention of transvaginal ultrasound which aided in noninvasive diagnosis of various pathological conditions like endometriosis. Thereupon, laparoscopy was not needed to confirm endometriosis.


Though we saw a major shift in the diagnosis, the definitive management was majorly performed at the discretion of the surgeon's skill and expertise. Surgeons confident in doing laparoscopy, performed endometriotic surgeries via laparoscopy. Those proficient in open laparotomies, did the same to provide best results to patients. However, laparoscopy has an edge over laparotomy with a wider visualization of pelvic structures.


Complicated surgeries like adhesiolysis, cystectomy, oophorectomy, adnexectomy and even hysterectomy was done via operative laparoscopy which became a major surgical technique and a gold standard procedure.

After performing the surgery if the patient stays pain free for a long period, ironically, we can expect some damage to the ovarian tissue that may have occurred at the time of surgery. Her pain is now probably reduced due to minimal or no estrogen production. Hence, long symptom free period post-surgery should raise suspicion of reduced ovarian reserve.

Of late, we have come to a consensus that endometriosis has no definitive cure. Even with extensive surgery the recurrence is 99.9%, as surgery will not eliminate the hypothesis of retrograde menstruation or coelomic metaplasia. Recurrence after surgery may present with more severe disease with extensive adhesions, pain and reduced ovarian reserve.

The two major complaints patients have has been pain and infertility, during adolescence or in the reproductive age. In adolescent age group, it is best to manage their symptoms conservatively as there is no permanent cure. Pain can be treated with simple analgesics like NSAIDs (anti prostaglandin). Surgery must be avoided as complications like rupture, torsion, infection and malignancy rarely occur with endometriosis. Hence, there is no fear of complications even if the endometriosis is left behind. In extreme cases with acute pain or in the verge of complications, surgery may be performed, taking care not to damage the residual ovarian tissue so that ovarian reserve can be conserved. Even after surgery, recurrence needs to be expected and explained.





When a couple's concern is infertility, it is vital to evaluate both the partners first. Mainly to rule out other factors that may be responsible for infertility, like reduced ovarian reserve, tubal and uterine pathologies in the female, abnormal semen analysis in the male or severe sexual dysfunction in either or both. When we are certain that there is no other contributing factor leading to infertility other than endometriosis, it becomes imperial to correct the tubo-ovarian relationship by adhesiolysis through laparoscopy so that couple can have a fair chance to try for natural conception. After correcting the pelvic anatomy, tubes might become freely mobile and can easily aspirate the fluid along with egg that is released into the pelvic cavity during ovulation and be available for sperms at ampullary region.

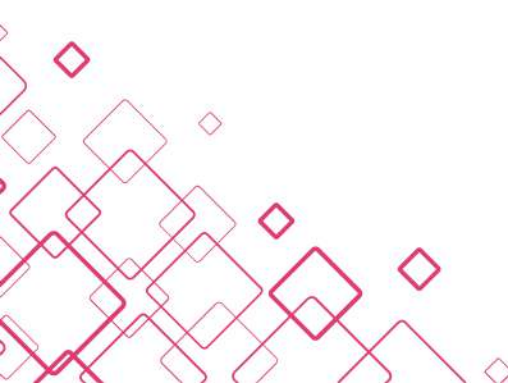
If any of the above-mentioned contributing factors for infertility are present, then it is futile to perform laparoscopy just to correct the tubo-ovarian anatomy.

If an infertile patient has symptoms of severe pain not abetting to medical treatment, then probably surgery needs to be performed by the best of surgeons, being mindful about conserving the ovarian reserve as much as possible.

If endometriosis is diagnosed incidentally and the patient is asymptomatic or has no complaint irrespective of the extent of disease inside her body, it is best to take our hands off and desist any sort of treatment. Till today, the gold standard treatment of endometriosis was laparoscopy even if asymptomatic. We need to rethink this concept.

Before jumping in and doing a laparoscopic surgery, the gold standard treatment is to address what majorly worries the patient. Many times, medical management for pain is all that is needed. Sometimes, we might have to take calculated decisions and offer ART to treat infertility. Extensive pelvic clearance may be needed for some with irresistible pain with deep infiltrating lesions. Overall, we can only address what worries the patient at that moment as there is no definite cure for endometriosis and recurrence is sure after a clearance surgery unless ovaries per se are removed.

Knowing the novel dynamics of endometriosis, let us work collectively as a team and learn the art of providing holistic care to patients with this debilitating disease, so that they can be symptom free with minimal medicine and hope to carry a baby with a well-tailored, comprehensive management.



"Awakening the Dormant: Revitalizing Male Infertility Evaluation and Treatment with Scientific Wisdom"

Dr. Raju Nair

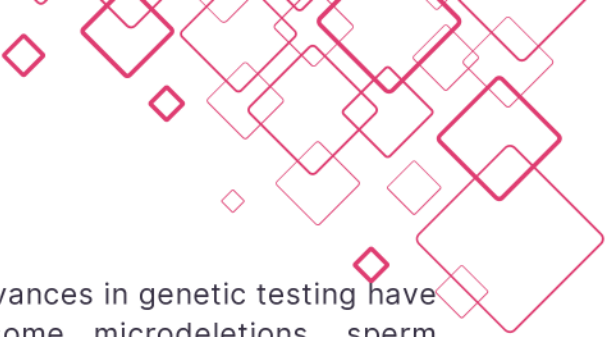
Head (Reproductive medicine)
Mitera Hospital , Kottayam ,Kerala



In the past, the evaluation and treatment of male infertility often languished in a state of limited understanding and innovation, resembling a slumber within the realm of reproductive medicine. The introduction of ICSI in early 90's has marked a significant paradigm shift in the male infertility management. Rather than prioritizing the enhancement of fundamental understanding regarding male infertility causes, the role of abnormal sperm components, and potential treatments, there's an emphasis on the motto "find and select a spermatozoon and do ICSI". Additionally, advancements in ART predominantly concentrate on addressing female infertility and enhancing ART outcomes, resulting in a notable gender imbalance in reproductive research. This focus disproportionately slows down the progress of andrology research.

However, contemporary advancements in scientific knowledge and technology have sparked a remarkable awakening in this field. With a deeper understanding of the intricate biological mechanisms underlying male fertility, coupled with the advent of sophisticated diagnostic tools and therapeutic interventions, the landscape of male infertility evaluation and treatment has undergone a profound transformation.

One of the groundbreaking developments in this arena is the refinement of diagnostic techniques. Traditional semen analysis, while informative, has historically served as the primary diagnostic tool for male infertility, may not provide a comprehensive understanding of male infertility despite its limitations in distinguishing fertile individuals from infertile patients. However, emerging technologies such as sperm DNA fragmentation testing, and advanced imaging modalities offer deeper insights into sperm quality and function. These diagnostic tools enable clinicians to pinpoint specific issues contributing to infertility, paving the way for personalized treatment strategies. This functional assessment of spermatozoa leads to a surge in research focusing on the impact of lifestyle factors on male fertility. Studies have highlighted the detrimental effects of factors like obesity, smoking, alcohol consumption, and sedentary lifestyles on sperm health. Conversely, adopting healthy lifestyle habits, including regular exercise, balanced nutrition, and stress management, has been shown to improve fertility outcomes in men. This emphasis on lifestyle modification underscores the importance of holistic approaches in addressing male infertility.




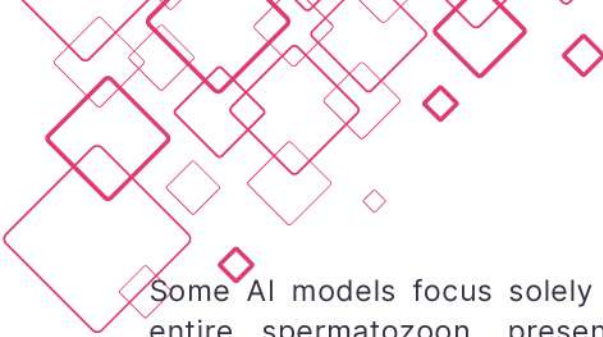
Another important area is genetics of male infertility. Advances in genetic testing have identified specific gene mutations like Y chromosome microdeletions, sperm aneuploidy testing, and chromosomal abnormalities associated with infertility. Recently polymorphic variations like quantitative positional modification of constitutive heterochromatin has been shown to have association with male infertility. Higher incidence of this variant on Y chromosome can contribute to infertility due to silencing effect of otherwise normally expressed genes. Understanding the genetic basis of male infertility not only facilitates accurate diagnosis but also holds promise for the development of targeted therapies tailored to individual genetic profiles. With the limitations of current genetic diagnostic tests, efforts should be targeted towards developing novel clinical assays to increase the identification of genetic etiologies, that would decrease the prevalence of infertile patients diagnosed as idiopathic.

Recent developments in sperm selection during intracytoplasmic sperm injection (ICSI) have focused on enhancing the efficiency and outcomes of assisted reproduction techniques. Advanced technologies such as sperm microfluidics, magnetic cell sorting for sperm preparation and high-resolution imaging have enabled precise assessment and selection of sperm with optimal morphological and functional characteristics. These techniques aim to improve fertilization rates, embryo quality, and ultimately, pregnancy success rates.

The advancements in "omics" technology, encompassing genomics, transcriptomics, proteomics, epigenomics, and metabolomics, have revolutionized the understanding and diagnosis of male infertility. RNA sequencing has uncovered diverse RNA profiles within human spermatozoa, challenging previous assumptions about sperm transcriptional activity and suggesting potential diagnostic roles in male infertility and transgenerational inheritance. Systematic reviews have identified specific microRNAs and proteins in seminal plasma that may serve as biomarkers for idiopathic male infertility, with implications for testicular sperm extraction (TESE) outcomes and assisted reproductive technology (ART) success. Epigenetic studies have revealed abnormal methylation patterns in infertile men's spermatozoa, correlating with ART outcomes and recurrent pregnancy loss (RPL). Recent discoveries regarding sperm centriole structure and function shed light on their importance in embryo development and their association with unexplained male infertility. Additionally, metabolomics has emerged as a promising avenue for diagnosing male infertility, with potential biomarkers identified in seminal plasma. These advancements underscore the multidimensional nature of male infertility and offer promising avenues for improved diagnosis and treatment outcomes.

In recent years, artificial intelligence (AI) utilizing machine learning systems has significantly impacted assisted reproductive technology (ART) innovations and research. AI has the potential to assist or automate various ART procedures. In the field of andrology, AI holds promise in overcoming the subjectivity of semen analysis evaluation, particularly in morphology assessment.



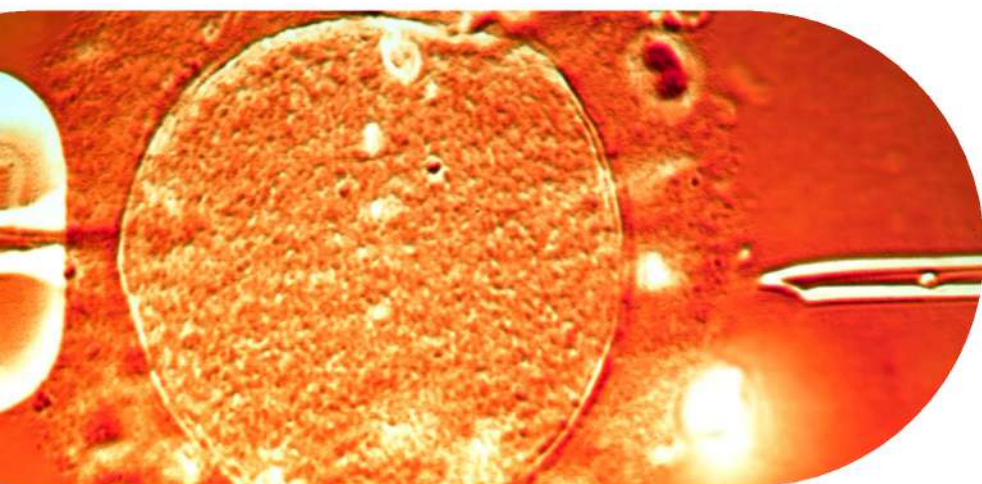


Some AI models focus solely on sperm head morphology, while others assess the entire spermatozoon, presenting challenges in result comparison and clinical application. AI also shows potential in assessing sperm concentration, progressive sperm motility, and total motile sperm count. AI has the capacity to standardize clinical protocols and enhance quality control in andrology laboratories. By introducing predictive maintenance for ART instruments and automating the analysis of key performance indicators, AI can ensure the reliability and consistency of laboratory processes, thereby improving overall efficiency and patient outcomes. Overall, while there are hurdles to overcome, the integration of AI into male infertility diagnosis and treatment holds tremendous promise for improving patient care, advancing scientific understanding, and ultimately increasing the likelihood of successful conception for couples facing infertility.

The intersection of oncofertility and male factor infertility has witnessed notable advancements, providing cancer patients with optimism for safeguarding their fertility and achieving their desires for parenthood despite the hurdles of cancer treatment. Emerging cryopreservation techniques and refined cryoprotectant protocols promise a brighter future for individuals who have survived cancer.

In the realm of male infertility research, the APHRODITE criteria have emerged as a pivotal framework for understanding and addressing this complex condition. Developed by experts in the field, these criteria provide a comprehensive assessment tool that integrates various aspects of male reproductive health. The APHRODITE criteria aim to address this gap by providing a structured approach to characterize male infertility in men seeking paternity, particularly those who may benefit from hormonal treatment. Importantly, these criteria are not designed for men with established infertility diagnoses, such as varicocele, infection, or obstruction, who would not benefit from hormonal treatment.

These developments herald a new era of precision medicine in the field of reproductive health, offering renewed hope to individuals and couples striving to build their families despite the challenges of infertility. As researchers continue to unravel the complexities of male infertility, the future holds promise for more effective interventions and improved outcomes for those affected by this condition





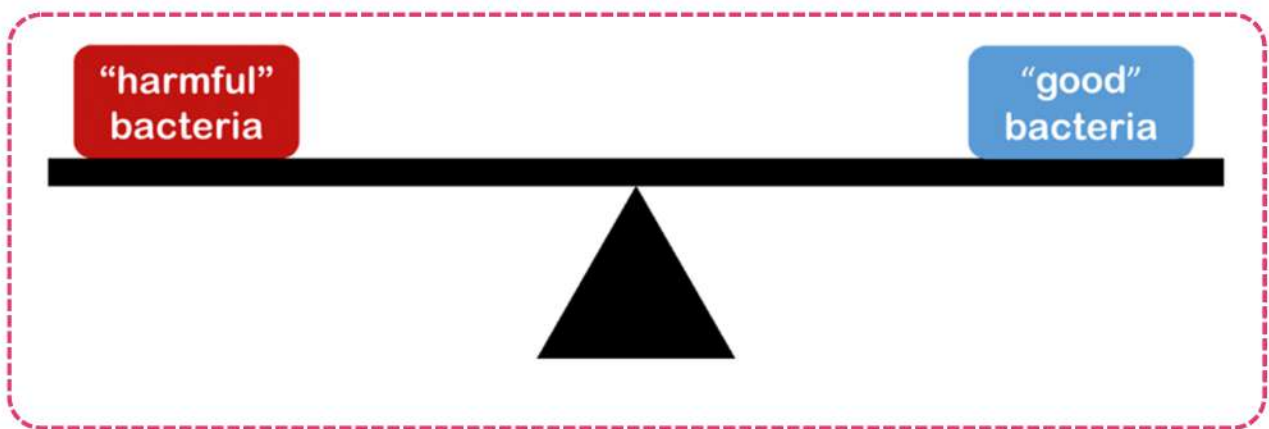
Probiotics in Infertility

Dr. Neharika Malhotra

Agra

- The vaginal microbiota plays a pivotal role in maintaining the physiological homeostasis of the environment and protects from the colonization by opportunistic pathogens.
- A healthy vaginal ecosystem is characterized by a predominance of Lactobacillus species, mainly Lactobacillus crispatus, Lactobacillus iners, Lactobacillus gasseri, and Lactobacillus jensenii, which actively contribute to lower vaginal pH (<4.5) through lactic acid production.

MAINTAINING VAGINAL HOMOESTASIS IS IMPORTANT FOR A WOMENS HEALTH
It's the balance between the harmful and good bacteria



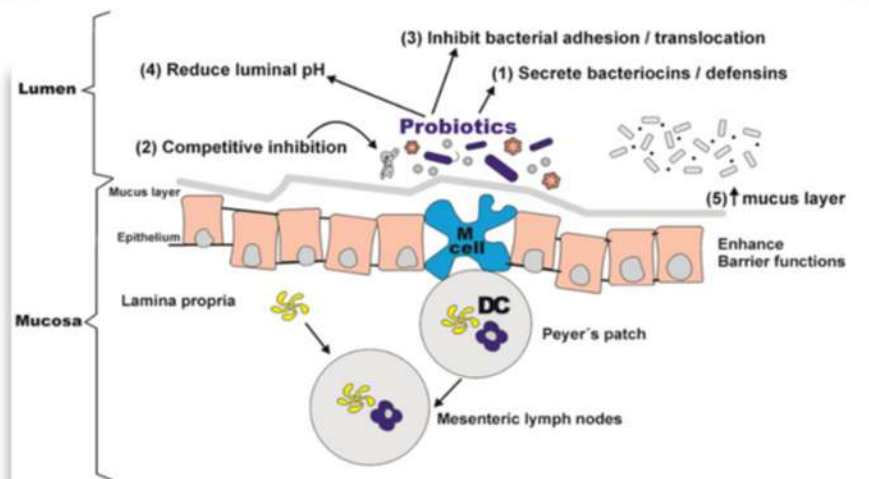
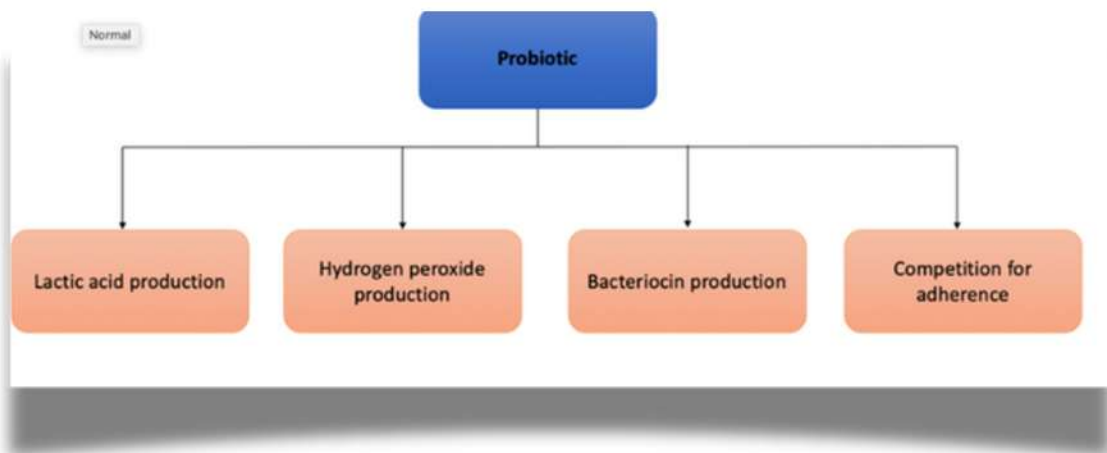
Type of vaginitis	Risk factors
Bacterial vaginosis	Low socioeconomic status, vaginal douching, smoking, new or multiple sex partners, unprotected intercourse,
Vulvovaginal candidiasis	Recent antibiotic use, pregnancy, uncontrolled diabetes mellitus, AIDS, corticosteroid use, other immunosuppression

WHAT IS A PROBIOTIC ?

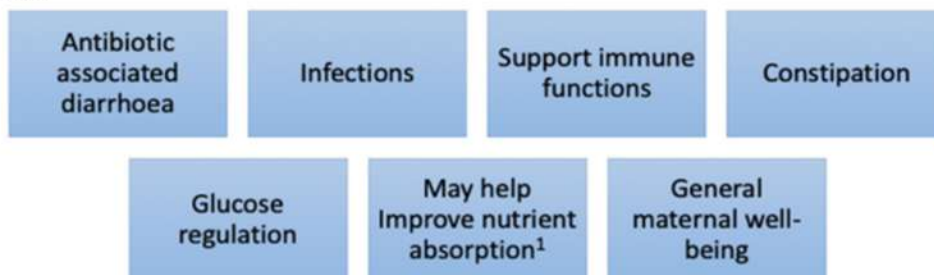
- Probiotics are live bacteria and yeasts that are good for your health, especially your digestive system. We usually think of bacteria as something that causes diseases. But your body is full of bacteria, both good and bad. Probiotics are often called "good" or "helpful" bacteria because they help keep your gut healthy.

HOW DOES A PROBIOTIC WORK?

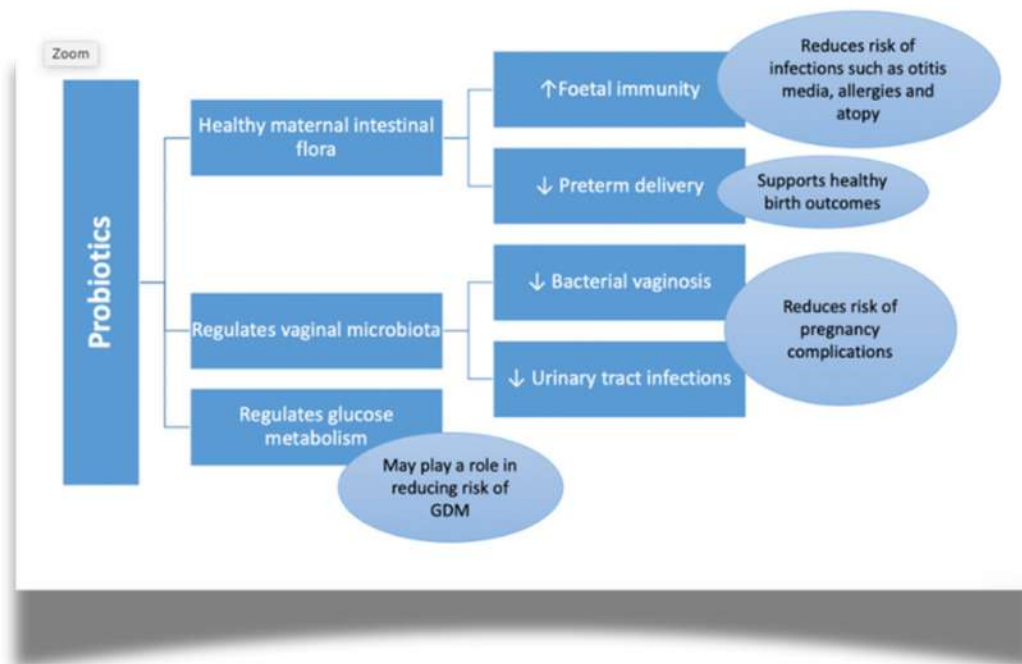
- When you lose "good" bacteria in your body (like after you take antibiotics, for example), probiotics can help replace them.
- They can help balance your "good" and "bad" bacteria to keep your body working like it should.



USES



PROBIOTICS BEYOND GASTROINTESTINAL BENEFITS –



PROBIOTICS AND REPRODUCTIVE OUTCOMES -

- An increasing no of studies have highlighted the correlation between infertility and microbiota
- Many researchers have noticed that infertile women host a different microbiota
- Vaginal dysbiosis is also associated with infertility, adverse reproductive outcomes, and poor clinical outcomes in women undergoing invitro fertilization (IVF)
- Especially, Bacterial vaginosis is linked to infertility and adverse clinical outcomes in women
- In infertile women, the prevalence of bacterial vaginosis was found to be 19%
- Whereas the prevalence of abnormal microflora including bacterial vaginosis and intermediate microflora was reported to be 39%
- A high prevalence of bacterial vaginosis and abnormal vaginal microbiome was reported in IVF patients
- It is associated with tubal infertility and miscarriage in women following IVF and may negatively affect the clinical pregnancy rate in IVF patients
 - It is thought that women with diminished Lactobacilli in vagina develop antisperm antibodies and have failure in in vitro fertilization
 - A high prevalence of bacterial vaginosis and abnormal vaginal microbiome was reported in IVF patients
 - It is associated with tubal infertility and miscarriage in women following IVF and may negatively affect the clinical pregnancy rate in IVF patients
- In infertile patients undergoing IVF, the presence of non-lactobacillus-dominated microbiota of < 90% has been associated with a significant decrease in
 - Implantation (60.7% vs 23.1%)
 - Pregnancy (70.6% vs. 33.3%)
 - Live birth rate (58% vs. 6.7%)
 - RPL patients have a higher prevalence of pathologic alteration of bacteria



PROBIOTICS HAVE SHOWN A POSITIVE ROLE IN PREVENTING PRETERM BIRTHS –

- Protective action of probiotics against preterm birth starts preliminarily by avoiding the onset of BV, which is a primary barrier to prevent the ascending infection
- Lactobacilli can prevent the degradation of cervical tissue by inhibiting the colonization of pathogenic bacteria
- Release of MMP-8 which reduces the ascension of pathogens to uterine region and microbial invasion of the amniotic cavity
- Due to anti-inflammatory and immunomodulatory properties it can reduce systemic inflammation which plays a central role in the cascade of events that lead to preterm labor

SAFETY PROFILE

Probiotic bacteria are normal commensals and non-pathogenic in nature. The FDA labels probiotics as GRAS (generally recognizes it safe). They also do not contain plasmids and have a good enzyme profile. They have not been associated with platelet aggregation or breakdown of intestinal proteins and do not reach the systemic circulation of the foetus. No incidences of miscarriages have been reported with probiotics. There have been no reports of bacterial sepsis with probiotics and multiple studies suggest no adverse reactions what so ever. Hence, probiotics are a safe and feasible option in conferring an umbrella of health benefits during pregnancy and lactation to the mother and to the foetus.

IMPORTANT POINTS

- Probiotics can be called a ‘wonder nutrient’ with no adverse reports which can help confer positive outcomes during pregnancy and lactation and support foetal development
- The effect of probiotics is dependent on strain, the colony forming units (CFU) and duration of supplementation
- Presence of prebiotics along with probiotics may accentuate the effect of probiotics during pregnancy
- Probiotic supplementation can be recommended to help resolve maternal gastrointestinal discomfort, common infections and reduce the risk of allergies in infants
- An abnormal vaginal microbiota composition has been shown to lead to pre-term births, miscarriage, and problems with conceiving.
- Studies have suggested that dysbiosis reduces successful early pregnancy development during IVF.
- Women with an abnormal vaginal microbiota are roughly 1.4 times less likely to have a successful early pregnancy development after IVF treatment when compared to women with normal microbiota.

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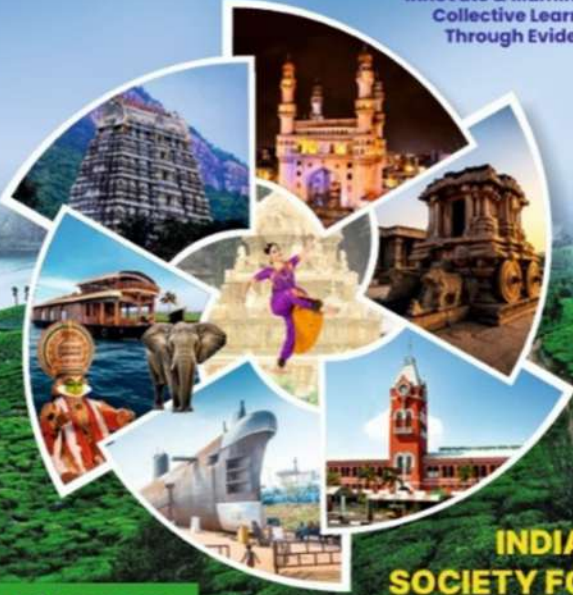
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