FPS(I)
Preserve_Create_Perpetuate

Newsletter FPSI
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Preserving Futures

A Newsletter by Fertility Preservation Society (India)

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Welcome Address

Dear Friends,

Greetings from the 'Fertility Preservation Society' of India! This newsletter is packed with information on the recent advances in the field from across the globe, all in a concise manner. In addition, it is a ready reckoner of recent and forthcoming activities of the FPS(I).

The society is forging ahead steadily in guiding clinicians from across the country in establishing fertility preservation services in a meaningful and multidisciplinary manner. I invite all of you to join hands in this endeavour of establishing a fertility preservation network across the country and help serve the young population affected with cancer. This is a need of the hour, as India braces itself for an ever increasing incidence of cancers. Each one of us can strengthen these efforts by simply becoming a member of the society and contributing each one's data to the fertility preservation registry! Login to the FPS(I) website https://fpsind.org/ for more details.

I am overjoyed to see the popularity of the first online certification course on fertility preservation. On behalf of all the members of the current executive committee, I would like to express our gratitude to Dr. Nalini Kaul Mahajan for this great initiative. Do keep a watch out for the dates of the next course, as it is a great way of strengthening knowledge about this niche area in our clinical practice.

Enjoy reading this carefully curated Newsletter by the most efficient and dedicated team of Dr. Sujata Kar and Dr. Aruna Tantia. They have created a means to convey all the above and much more through this newsletter.

Best wishes,
Dr. Padma Rekha Jirge
President FPS(I)

About FPSI

The Fertility Preservation Society (India) is a registered National Non-government body started by a group of Reproductive Specialists concerned about the reproductive issues of young cancer patients and survivors, patients suffering from medical illness that leads to gonadotoxic treatments and genetic issues that cause premature ovarian insufficiency.

Cancer is on the rise in most countries the 'National Cancer Registry of India' suggests that the annual number of patients who develop cancer in India is set to rise from about 9.79 lakh in 2010 to 11.4 lakh in 2020. It is believed that every 250th adult will soon be a survivor of childhood cancer. Approximately 30% 75% males and 40%-80% of females face possible infertility as a result of their chemotherapy, radiation and surgery. Fortunately survival rates have increased dramatically with almost 70-75% patients surviving if the diagnosis is made early. In cancer treatment the focus now is not only on extending life but on providing 'quality of life'.

Reproduction is the essence of life and the right of every individual. Having cancer or illness that compromises fertility, does not take away the desire to have a baby. Advances in knowledge of disease, newer and safer cytotoxic drugs and assisted reproduction technology have given us an opportunity to help these young men and women faced with a lifetime of sterility and despair

Fertility preservation techniques allow us to preserve the gametes of patients going through drugs/treatments that damage directly or indirectly damage their reproductive ability Once gametes are preserved an individual or couple can start a family at a time of their choosing

We are proud to be a part of the 'Pan Asia Initiative on Fertility Preservation'. The formation of this group was initiated by our society along with 'Japan Society for Fertility Preservation' and Prof. Sam Kim past president of the International Society of Fertility Preservation.

Aims and Objectives of the Society:

1. To Promote the Science and Ethical practice of Fertility Preservation in India.
2. To provide validated fertility preservation units so that patients get the right treatment in the right place. Validation of the units will be done in association with International experts.
3. To create awareness among the medical fraternity about the advantages of fertility preservation.
4. To hold conferences, meetings and discussions for dissemination of scientific information and advances in treatment in this field.
5. To create awareness society in general and amongst affected patients and cancer survivors, of the possibility of preserving their reproductive potential
6. To hold public awareness lectures to spread information on fertility preservation.
7. To associate with and help form cancer support group in association with existing NGO's working in this area. (the society in associated with Can support, Can Kids and Forum for Breast cancer Awareness)
8. To publish a scientific bullet in twice a year giving scientific information.
9. To promote multidisciplinary collaborative research
10. To facilitate networking with doctors working in this field nationally and internationally.

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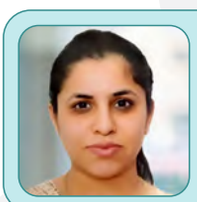

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EDITOR'S NOTE

It is with great honour and enthusiasm that I take on the role of editor for the Fertility Preservation Society of India's biannual newsletter. As the field of fertility preservation continues to evolve, our society stands at the forefront of progress—bridging clinical excellence, research innovation, and compassionate care. This newsletter aims to reflect that spirit by offering a platform to share key updates, thought-provoking perspectives, and the diverse voices of our members.

In this edition, along with my co-editor Dr Aruna Tantia ,we highlight recent advancements, interesting stories, and collaborative efforts that continue to shape the future of reproductive medicine in India.

In this edition, Dr(Prof) Bhagyalaxmi Nayak talks about their experience on endometrial carcinoma and fertility preservation. This report comes from the largest unit of Gynaecologic oncology in the state of Odisha. Their insights are invaluable. Dr kaushiki Sarkar from West Bengal draws our attention to various emerging technologies in Fertility Preservation. Another young Gynaecologist from Odisha, Dr Gayatri Satpathy, has highlighted recent research in the field of fertility preservation.

I invite you to engage with the content, contribute your insights, and help build a vibrant knowledge-sharing community. Together, let us strengthen our collective mission to protect and preserve the reproductive potential of individuals across all walks of life.

Thank you !

Dr. Sujata Kar &
Dr. Aruna Tantia

Fertility Preservation In Endometrial Carcinoma

Prof. Dr. B. Nayak
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Dr. Ranjita Patnaik
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Introduction:

Endometrial cancer (EC) is the most common gynecological cancer in developed countries, the standard treatment for it includes total hysterectomy, bilateral salpingo-oophorectomy (TH/BSO), and surgical staging. Of late delayed marriage , career options and increased incidence of PCOS , childbirth is delayed and the age during the first pregnancy has increased to >30 years. More than 70% of young women with early EC, are aged <40 years and nulliparous at the time of diagnosis. Hence, the need to preserve fertility in patients with early-stage EC is increasing.

Criteria for considering fertility-sparing options for management of Endometrial Carcinoma:(All Criteria Must Be Met)

1. Well-differentiated/ Grade 1(G1) endometrioid endometrial adenocarcinoma (EEC)on endometrial Biopsy. The evidence for the fertility-sparing treatment in G2 EEC is limited and decided on a case-by case basis.
2. Disease limited to the endometrium on MRI (preferred) or transvaginal ultrasound.
3. Absence of suspicious or metastatic disease on imaging
4. No contraindications to medical therapy or pregnancy
5. Patients should undergo counselling that the fertility-sparing option is NOT standard of care for the treatment of endometrial carcinoma.

Prerequisites:

- Ensure negative pregnancy test
- Consultation with a fertility expert prior to initiation of treatment.
- Joint counselling and care with a multidisciplinary team consisting of at least gynaecologic oncologists , fertility specialists, pathologists and radiologists should be proposed to all patients .
- Hysteroscopic-guided endometrial biopsy is preferred over blind biopsy or dilatation and curettage (D&C) for confirming diagnosis of endometrial carcinoma.
- Review of initial pathology by an experienced histopathologist / oncopathologist is recommended. The G1,G2,G3 grading system is recommended.
- Molecular evaluation of tumor and evaluation for inherited cancer risk is recommended.
- Myometrial invasion in patients with endometrial carcinoma should be assessed prior to treatment, using MRI or transvaginal USG by a specialized radiologist.

- Adnexal involvement should be ruled out by pelvic MRI or transvaginal Ultrasound (USG).
- Exclude extra-uterine disease(including pelvic or para-aortic lymph nodes)/synchronous or metastatic disease and distant metastases using MRI or CT scan .
- Molecular testing is preferred if available. p53abn tumours are more likely to progress, conservative therapy would probably be inappropriate, while for POLE-mutated carcinomas the treatment choice in the conservative era is still unclear.
- Genetic cancer syndromes need to be excluded.

Fertility-sparing Treatment options:

1. Weight management/ lifestyle modification
2. A combined approach consisting of hysteroscopic tumor resection, followed by oral progestins (Megestrol /Medroxy progesterone acetate)and/or levonorgestrel intra-uterine device, is the most effective fertilitysparing treatment.
3. **Hysteroscopic resection:** Complete hysteroscopic lesion resection, followed by oral progestins and/or levonorgestrel-intra uterine device, can be proposed after discussion, in an early and suspected focal myometrial invasion (1–2mm).
4. **Continuous progestin-based therapy:**

   Orally administered Megestrol Acetate at a dose of 160–320mg/ day or Medroxyprogesterone Acetate at a dose of 400–600mg/ day is recommended.

   A Levonorgestrel-Intra-Uterine Device(LNG-IUD) at a dose of 52mg, alone or in combination with oral progestins, is a safe and effective approach.

5. 5. Metformin an insulin sensitizer and a potent inhibitor of cell proliferation in EC cell lines through AMP-activated protein kinase (AMPK) activation and subsequent inhibition of the mTOR pathway can be used to treat EC in addition to progestin.

Duration of treatment:

- The recommended duration is 6–12 months, within which a complete response should be achieved.
- The maximum time should not exceed 15 months to achieve a complete response.
- If there is an absence of any kind of response at 6 months, multidisciplinary counselling is recommended for the management, which varies on a case-to-case basis.

Evaluation:

- Endometrial evaluation every 3–6 months (either D&C or endometrial biopsy). Hysteroscopic guided is preferred. LNG IUS may be displaced during procedure may need reinsertion.
- Two consecutive endometrial biopsies; with a minimal interval of 3 months should show complete response are necessary to plan conception.
- Clinical, pelvic examination and USG scan are recommended at every 3month follow-up visit.
- Conception should be encouraged, with continued surveillance/ endometrial sampling every 6–12 months.
- MRI could be considered on a case-by-case basis.

Pregnancy after fertility-sparing options for management:

- Women should be encouraged to actively conceive as soon as the complete response is achieved.
- The assisted reproductive technique (ART)

should be considered to improve the success rate and reduce the interval to conception without a higher risk of recurrence. However, natural conception may be considered within a defined time. (6–9 months).

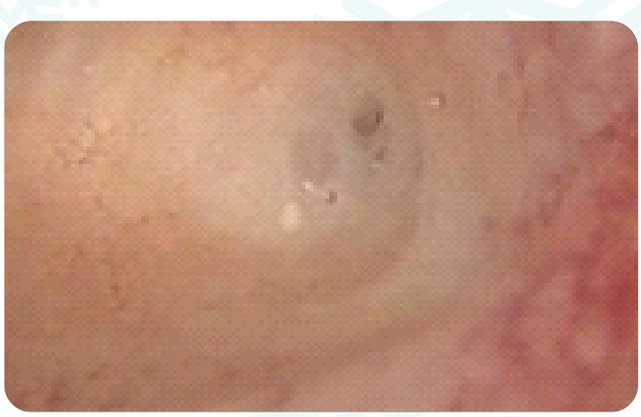
- For women who decline surgery after delivery and who do not plan their second pregnancy immediately after the first one; close surveillance by a multidisciplinary team with maintenance therapy with LNG-IUD should be recommended.
- If a patient is not actively trying to conceive in addition to consider continued surveillance/ endometrial sampling in addition to maintenance with progestin-based therapy.

Recurrence after fertility-sparing treatment :

- The risk of recurrence after fertility-sparing treatment for endometrial carcinoma may be equal for progestins or an LNG-IUD.

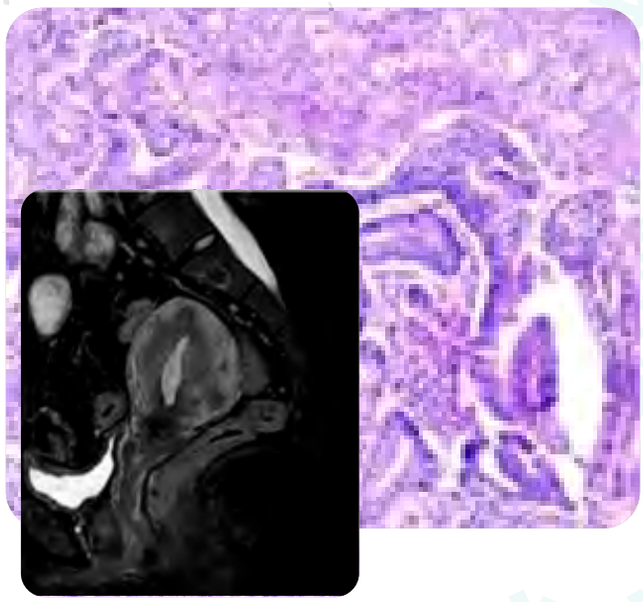
Indication of Definitive and completion surgeries:

- Endometrial cancer presents at 6–12 months of fertility-sparing treatment.
- TH/BSO with staging should be done after childbearing is complete or progression of disease on endometrial sampling.



- In selected premenopausal women, ovarian preservation may be considered after counselling for regular follow up.

Case Summary: 31-year , unmarried ,C/o intermenstrual bleeding x 3-4 months ,No



medical comorbidities, BMI- 32 Kg/m2 Family history: maternal grandfather- ca lung GC-Good, PS 1 TV scan pelvis showed Thickened endometrium with cystic spaces. Underwent hysteroscopy, endometrial biopsy

Intra-operative: Irregularity & hyperplasia seen on posterior & right lateral wall of uterus,B/L ostia seen, endocervical canal normal

Endometrial biopsy- Endometrioid ca, grade 1,

ER/PR-strong+, Molecular risk profile

(P53,MMR, HER2 Neu, POLE) could not be done.

CEMRI pelvis- Uterus , mildly bulky. ET-7mm.

JZ- 11mm, well preserved

Few seedling hypointense lesion in fundal region & along posterior uterine wall , largest- 6x5mm

B/L ovaries normal .No lymphadenopathy. Minimal free fluid in POD.

Mirena Placed. Megestrol acetate 80mg twice a day & Metformin 500 twice daily started.

Endometrial biopsy done thrice at 3 month interval; HPR- Secretory endometrium

Patient conceived with minimal ART procedure and delivered by LSCS.

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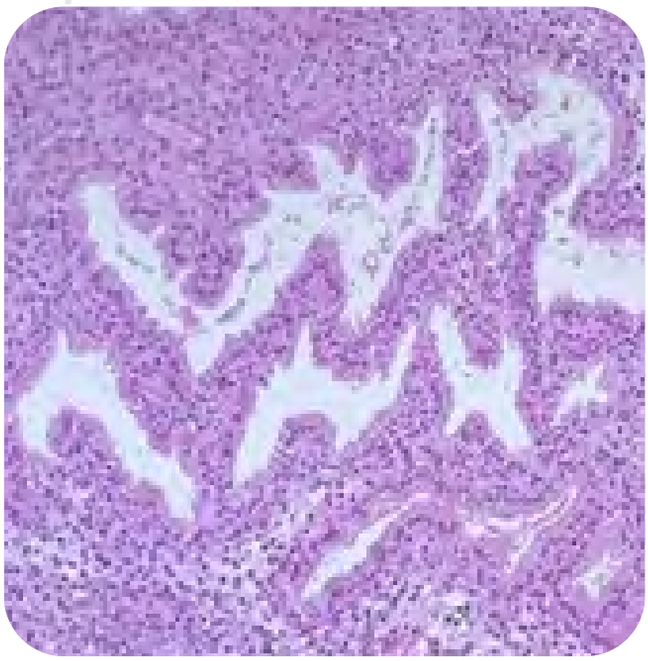

Emerging Technologies In Fertility Preservation For Malignancies

Dr Kausiki Ray Sarkar
MBBS, DGO, DNB, Clinical Fellow In Infertility & Reproductive Endocrinology

Globally the fertility rate is declining through decades. As per the article, published in The Lancet, on March 20th, 2024, named, Dramatic decline in global fertility Rates, set to transform global population pattern by 2100, reveals “By 2050, over three-quarters (155 of 204) of countries will not have high enough fertility rates to sustain population size over time; this will increase to 97% of countries (198 of 204) by 2100.”(1) With this background information, the cancer patients, who are vulnerable to fertility decline because of the disease itself as well as for the treatment of chemo radiation-- need more attention. On top of that, now a days, rates of cancer survivors are increasing along with rates of detections of young cancer patients . More than 70,000 adolescent and young adult (AYA) patients, with ages between 15 and 39 years, are diagnosed with cancer every year only in the United States. The incidence of cancer in children younger than 15 years of age is also approximately 10,000 cases per year(2) .

In Europe, more than 15,000 Adolescents & Young Adults are diagnosed with cancer each year, according to the International Society of Paediatric Oncology. In fact, the 5-year survival rate for pediatric cancer patients approaches 80%. (3).

In order to improve the quality of life and the survival of patients, the improvement of FP techniques has become an important topic in the field of research over the past years (4)

There are a number of existing techniques , which are being used, since the inception of fertility preservation. In Females, The degree of the depletion of the ovarian reserve not only differs between chemotherapy and radiotherapy but also according to the dosage & duration. As regards chemotherapy, it varies depending on the age of the patient (the younger the patient, the lesser the risk of ovarian failure), the chemotherapy agent used (alkylating agents being of greatest risk) and the duration of the treatment. Oocytes are very sensitive to radiation. Exposure to 20-30 Gy of radiation or total body radiation of 15 Gy lead to the loss of ovarian function [premature ovarian failure (POF)] (4). For females, established FP methods are embryo, oocyte, and ovarian tissue cryopreservation (OTC), ovarian transposition, and conservative gynecologic surgery.

Newer techniques are evolving.1) Activation of ovarian follicles. Cryopreserved ovarian tissue from prepubertal patients and patients with POF contains immature primordial follicles. They need to be activated in order to start developing. This can be induced either in vivo [by interrupting the Hippo signaling pathway (5)] or in vitro, prior to autotransplantation, by activating the phosphatidylinositol 3-kinase (PI3K)/phosphatase and tensin homolog (PTEN)/protein kinase B (AKT)/Forkhead box O3 (FOXO3) pathway, which regulates primordial follicle activation in oocytes (5) This pathway also plays a crucial role in the follicle-stimulating hormone (FSH) stimulation of granulosa cell

differentiation in antral follicles and preovulatory follicles in oocyte maturation of (5). This may be a promising fertility option for prepubertal patients and patients with primary ovarian insufficiency, whose cryopreserved tissue contains immature primordial follicles suitable for this techniques. In vitro protocols involving the PTEN/AKT pathway are being developed in order to increase the pool of viable activated follicles available for in vitro growth (IVG) procedures (6)

2)In vitro follicle culture. This technique may be an option for patients who require urgent oncological treatment, and therefore are not good candidates for oocyte or embryo cryopreservation, where minimum of 2 weeks time is required. These are the patients with acute leukemia or acute myeloblastic leukemia (AML). OTC is the available option momentarily for these patients. However, the possibility of re-seeding original cancer cells from the ovarian tissue exists, and therefore other alternatives need to be raised. The ovarian follicle culture in vitro, aims to mitigate the risk of re-implanting malignant cells from the cryopreserved ovarian tissue. It is therefore useful in patients with cancers whose metastasis appear often in the ovary or patients with BRAC1 and BRAC2 mutations, due to the increased risk of an ovarian cancer, which would not make possible the transplantation of cryopreserved ovarian cortex (7).

However, the complete maturation of primordial follicles has not been achieved in humans yet (8). In this procedure, individual follicles are isolated from the patient's bank tissue, which will afterwards be matured in vitro to become a functioning oocyte. These will be fertilized, and the embryos will be transferred to the uterus. The follicles can be cultured in two-dimensional (2D) or three-dimensional (3D) systems. These 3D culture methods are the most successful in maintaining the sphericity and the communications between cells (7) and have also shown greater follicular viability, follicle and oocyte diameters and hormone production (4).

3) Artificial ovaries. The creation of an artificial ovary for transplantation is a very promising fertility-restoring technique.Isolated preantral follicles obtained from ovarian cryopreserved tissue, together with other ovarian cells in a 3D-matrix, or scaffold, result in a ovary-like environment, which could allow the growth of follicles and therefore could restore both fertility and endocrine function of the ovary once they are transplanted (4). Luyckx et al (9) achieved the survival and growth of murine ovarian follicles (primary, secondary and antral follicles) within 1 week following the transplantation of ovarian cells in a fibrin matrix. Moreover, Laronda et al (10) accomplished the initiation of puberty in ovariectomized mice following an artificial ovary transplant.

4)Specific target tissue drugs. Both nanoparticles and fertopotective agents share the aim of protecting ovarian cells during gonadotoxic oncological treatments. These are discussed below:

i) Nanoparticles. This procedure entails the encapsulation of the therapeutic agent in order to reduce its plasma clearance and therefore its toxicity. For such a purpose, a nanoparticulate formulation of the therapeutic agent is developed and encapsulated within liposomal vesicles or 'nanobins' (NB) (11). Ahn et al (12) demonstrated a superior antitumor efficacy of the nanoparticulate formulation of arsenic trioxide (As2O3) in nanobins [NB(Ni,As)] in a murine model of lymphoma as well as a reduced fertotoxicity. ii) Novel fertoprotective agents. Current research focus on two different pathways: a) Anti-apoptotic agents, such as imatinib, sphingosine-1-phosphatase (AS101), granulocyte colony-stimulating factor (G-CSF), thyroid hormone (T3) and tamoxifen (6), and they have shown to diminish follicle loss in animal models (13) and on b) agents which prevent follicle activation, such as AS101, an immunomodulator interacting with the PI3K/PTEN/AKT follicle activation pathway (14) and the anti-Mullerian hormone (13). In summary, a number of novel fertoprotectives agents to

protect oocytes against gonadotoxic treatments are being investigated and may be available soon (4).

In Males, Cryopreservation of SSCs in prepubertal children is one of the emrging techniques, worth mentioning. Prepubertal children do not undergo spermatogenesis yet, and therefore they do not have mature sperm in their testes. Hence, the cryopreservation of spermatozoa is not possible. The only possibility for them is to preserve testicular tissue, which contains SSCs. In an analogous manner to the cryopreservation of ovarian tissue in women, the testicular tissue can be obtained (through a testicular biopsy) and cryopreserved in form of spermatogonia or in form of testicular tissue (using slow-freeze or ultra-rapid techniques). This will be thereafter available to use when the patient is free of oncological illness and desires to have children. Once the tissue is thawed, it would allow in vitro spermatogenesis (15) or autotrasplantation of the cryopreserved tissue, either by infusion of a cell suspension into the seminiferous tubules or intratesticular grafting of the tissue (16)

Apart from the emerging techniques, the existing techniques are quite effective and practiced worldwide, with take home baby birth rate of approximately 36.5%, which is quite encouraging.

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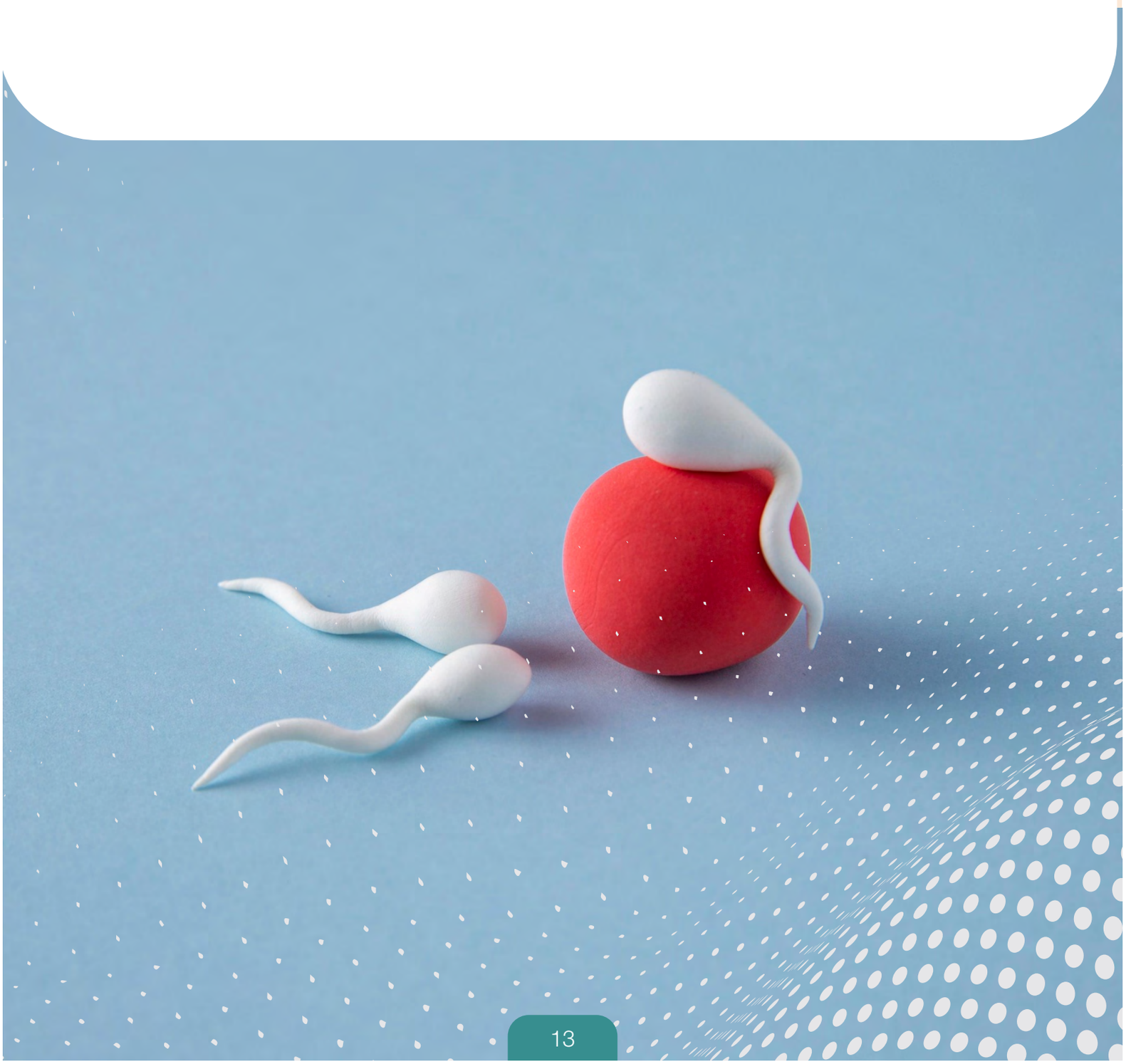


Top Research Around The Globe In Ferility Preservation

Dr. Gayatri Satpathy

Research Articles In Fertility Preservation:

1. Fertility preservation before and after cancer treatment in children, adolescents, and young adults

Citation:

Yang, Emily H., Harmonie B. Strohl, and H. Irene Su. "Fertility preservation before and after cancer treatment in children, adolescents, and young adults." Cancer 130.3 (2024): 344-355.

Synopsis:

Fertility is a top concern for children, adolescents and young adults diagnosed with cancer. There are effective and evidence- based interventions to preserve fertility prospects. At diagnosis, for females various options such as mature oocyte/embryo cryopreservation, ovarian tissue cryopreservation, ovarian suppression with GnRH agonists, in vitro oocyte maturation, and/or conservative management for gynaecologic cancers exist. Post treatment, several populations may consider undergoing oocyte/embryo cryopreservation. Male survivors' standard of care Fertility Preservation (FP) treatments centre on sperm cryopreservation and experimental cryopreservation of testicular tissue in case of pre-pubertal males. Fertility discussions are a part of quality oncology care throughout the cancer care continuum. Barriers to FP care are multi level. There are four components of Fertility preservation care delivery that need to be addressed to develop systemized interventions and workflows for the greater benefit of these individuals affected with cancer. These are Fertility Preservation (FP) needs screen, oncology referral to fertility, FP consultation, and FP service delivery. In addition, ethical issues also need consideration. There is a need to discuss tissue disposition, obtain assent from minors and raise the potential for post-humous reproduction.

2.Fertility Preservation in Cervical Cancer-Treatment Strategies and Indications

Citation:

Salman L, Covens A. Fertility Preservation in Cervical Cancer—Treatment Strategies and Indications. Current Oncology. 2024 Jan 4;31(1):296-306.

Synopsis:

Cervical cancer is the fourth most common cancer in women worldwide. As 37% of patients with newly diagnosed cervical cancer are under the age of 45, fertility preservation options are often warranted. Surgical treatment modalities for early stage cervical (tumor size < 2 cm) include radical and simple trachelectomy as well as cervical conization. Neoadjuvant chemotherapy is an alternative option for patients with bulky cervical cancer (tumor size > 2 cm) wishing to preserve fertility. The rationale for administering chemotherapy is to shrink the tumor and make an fertility sparing surgery feasible. Fertility preservation can be performed through mature oocyte cryopreservation, embryo cryopreservation, or, in cases where chemotherapy cannot be delayed, ovarian tissue cryopreservation. In patients with locally advanced cervical cancer, treatment includes external beam

radiation (EBRT) +/– brachytherapy +/– chemotherapy. In patients receiving EBRT, ovarian transposition (OT) can be offered prior to treatment initiation to preserve ovarian function in addition to fertility preservation. In certain cases of locally advanced disease where uterine preservation is not an option, fertility preservation followed by surrogacy can be offered.

3. Fertility preservation in adult male patients with cancer: a systematic review and meta-analysis

Citation:

Li Q, Lan QY, Zhu WB, Fan LQ, Huang C. Fertility preservation in adult male patients with cancer: a systematic review and meta-analysis. Human Reproduction Open. 2024 Jan 1;2024(1): hoae006.

Synopsis:

The number of cancer survivors has been increasing with recent improvements in cancer treatment modalities. However, cancer treatments, including surgery, radiotherapy, and chemotherapy, can have a transitory or permanent detrimental impact on male fertility. Their gonadotoxic side effects can severely impair fertility in an agent- and dose-dependent way, and combination treatments of radiotherapy and chemotherapy are more gonadotoxic than either modality alone. Sperm cryopreservation is the only way to efficiently preserve male fertility. ART plays an important role in pregnancy achievement, with ICSI resulting in better clinical outcomes than IVF and IUI in patients with cancer. The observed utilization rate of frozen sperm at 9% may underestimate the actual usage, as the short follow-up period is inadequate for obtaining comprehensive data on the use of frozen sperm in young cancer survivors.

4. A 20-year overview of fertility preservation in boys: new insights gained through a comprehensive international survey.

Citation:

Duffin K, Neuhaus N, Andersen CY, Barraud-Lange V, Braye A, Eguizabal C, Feraille A, Ginsberg JP, Gook D, Goossens E, Jahnukainen K. A 20-year overview of fertility preservation in boys: new insights gained through a comprehensive international survey. Human reproduction open. 2024 Jan 1;2024(2):hoae010.

Synopsis:

Testicular tissue cryopreservation provides a potential strategy for fertility preservation for pre-pubertal boys undergoing gonadotoxic treatment. Although this technique remains experimental, worldwide testicular tissue has been cryopreserved from over 3000 boys under the age of 18 years for a variety of malignant and non-malignant indications. This international survey presents data from 16 centres worldwide that have cryopreserved testicular tissues from patients under the age of 18 years. Non-malignant conditions now constitute about one-third of the 3000 tissues that have been cryopreserved to date, including a minority of transgender, Klinefelter syndrome, and disorder of sex development cases. According to this study, haematological diseases constitute the dominant indication among the malignant as well as the non-malignant patient groups; this is likely due to the significantly gonadotoxic effect of haematopoietic stem cell transplantation. There is currently variation in size of testicular tissue fragment being frozen. It is important that the fragments are small enough to allow full penetration of cryoprotectant, and large enough to contain adequate numbers of spermatogonia and supporting cells. Dimethylsulphoxide is commonly used as a cryoprotectant. Tissues from all patients with malignant indication for cryopreservation should be assessed for the presence of malignant infiltration. While no centres have yet reported on transplantation of immature testicular tissue in human patients, 11 centres are planning to transplant tissue. Long term reproductive follow up of patients who have undergone testicular cryopreservation is required.

5. Pharmacological methods for ovarian function and fertility preservation in women with cancer: A literature review

Citation:

Cvetanovic AS, Lambertini M, Punie K, Brko GG, D ZIVKOVIC NI, Popovic MJ, Kovacevic MM, Popovic LS. Pharmacological methods for ovarian function and fertility preservation in women with cancer: a literature review. Oncology Research. 2024 Jul 17;32(8):1309.

Synopsis:

With the introduction of new cancer therapy options, the treatment outcomes of women with different malignancy types have substantially improved. Preserving ovarian function and fertility is an essential aspect to consider when treating premenopausal women with cancer. Breast cancer, hematological malignancies, and ovarian cancer are some of the malignancies with treatments most associated with premature ovarian insufficiency (POI). For women with aggressive malignancies that require urgent treatment, fertility preservation in the form of oocyte or embryo freezing may not be suitable as it requires at least 2 to 3 weeks time. At present, the use of a gonadotropin-releasing hormone agonist (GnRHa) at the same time as chemotherapy is the only available pharmacological method for preserving ovarian function.

Current guidelines from the American Society of Clinical Oncology and European Society for

Medical Oncology (ESMO) Clinical Practice Guidelines recommend sperm, oocyte, and embryo cryopreservation as a standard practice and only offering GnRHa to patients when proven fertility preservation methods are not feasible. The coadministration of a GnRHa with chemotherapy can be used along with the proven fertility preservation methods.

The administration of GnRH agonist is also proposed for women not seeking fertility to protect ovarian function and reduce incidence of POI. Most RCTs on breast cancer have revealed a decrease in the risk of treatment-induced POI, regardless of the hormone receptor status. However, the short follow-up period has been a recurring limitation of most studies. On the other hand, studies on hematological malignancies have yielded negative results; nevertheless, the findings must be interpreted with caution owing to numerous limitations. Future research should not only focus on treatment efficacy but also simultaneously monitor ovarian reserve and the effect of new therapies on POI.

There are a number of existing techniques , which are being used, since the inception of fertility preservation. In Females, The degree of the depletion of the ovarian reserve not only differs between chemotherapy and radiotherapy but also according to the dosage & duration. As regards chemotherapy, it varies depending on the age of the patient (the younger the patient, the lesser the risk of ovarian failure), the chemotherapy agent used (alkylating agents being of greatest risk) and the duration of the treatment. Oocytes are very sensitive to radiation. Exposure to 20-30 Gy of radiation or total body radiation of 15 Gy lead to the loss of ovarian function [premature ovarian failure (POF)] (4). For females, established FP methods are embryo, oocyte, and ovarian tissue cryopreservation (OTC), ovarian transposition, and conservative gynecologic surgery.

Newer techniques are evolving.1) Activation of ovarian follicles. Cryopreserved ovarian tissue from prepubertal patients and patients with POF contains immature primordial follicles. They need to be activated in order to start developing. This can be induced either in vivo [by interrupting the Hippo signaling pathway (5)] or in vitro, prior to autotransplantation, by activating the phosphatidylinositol 3-kinase (PI3K)/phosphatase and tensin homolog (PTEN)/protein kinase B (AKT)/Forkhead box O3 (FOXO3) pathway, which regulates primordial follicle activation in oocytes (5) This pathway also plays a crucial role in the follicle-stimulating hormone (FSH) stimulation of granulosa cell

Did you know ? some interesting facts about fertility preservation

Dr Sujata Kar

Frozen Hope Since the '50s

The first baby from frozen sperm was born way back in 1953! Sperm banking has been helping cancer patients preserve their fertility ever since.

Chemo Isn't Always Fertility-Friendly

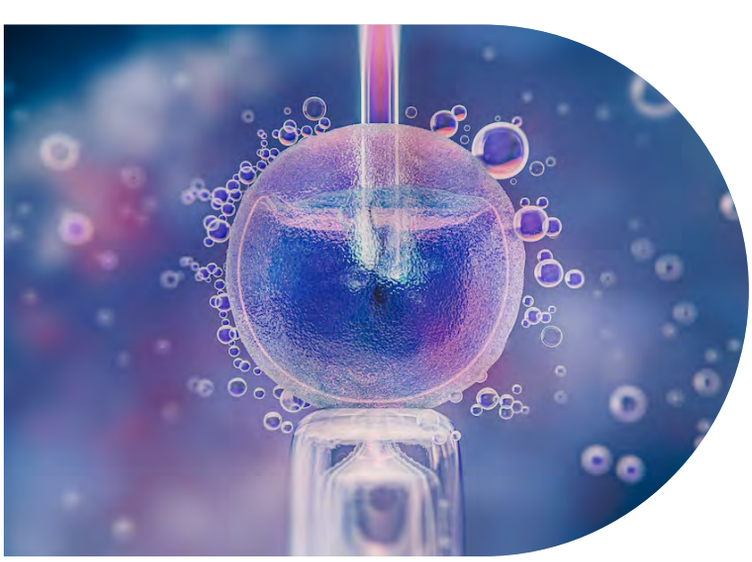
Some cancer treatments, especially chemotherapy, can seriously harm sperm production—sometimes for good.

No Need to Wait!

You can bank sperm within a day or two—without delaying cancer treatment. It's quick, easy, and smart.

Teens Can Do It Too

Yup, even teenage boys who've hit puberty can freeze their sperm. Age isn't a barrier—puberty is the key.



Some Cancers Hit Harder

Testicular cancer and Hodgkin's lymphoma are more likely to affect fertility. Knowing this early can make all the difference.

One Sample Might Be Enough

Even if just one sample is collected, it could still lead to fatherhood thanks to modern tech like ICSI.

The Info Gap is Real

Less than half of male cancer patients are properly informed about fertility preservation. We can do better!

Fatherhood After Cancer? Absolutely.

Men have successfully become dads using sperm they froze years or even decades ago.

It's About More Than Babies

Having the option to start a family later can be a huge boost to mental and emotional health.

Frozen Sperm Lasts a Long Time

Sperm can stay frozen and still be viable for 20+ years-so no rush!

Activities By Fps(i) – 2024

11th International Annual Conference of the Fertility Preservation Society (India), Hyderabad, 28th -29th September 2024

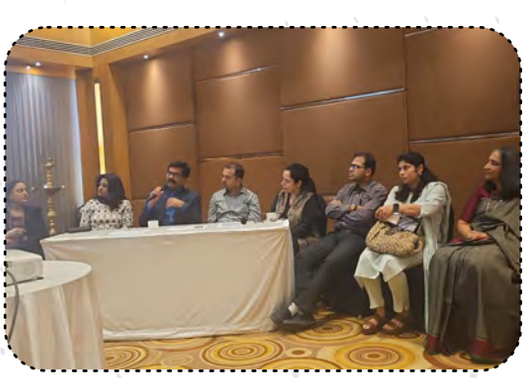
CME - “Preserving Fertility: Awareness to Action'' Life Beyond Cancer Held at SRMS IMS, Bareilly, 10th March 2024

CME – “Preserving Fertility: Awareness to Action'' held at Meenakshi Mission Hospital, Madurai, 11th April 2024

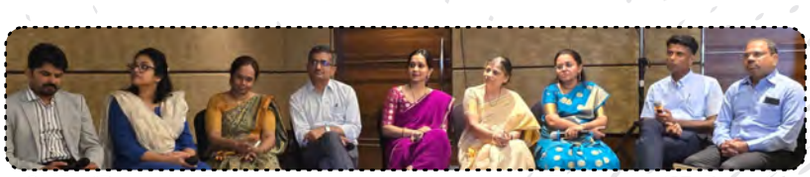
CME – “Preserving Fertility: Awareness to Action'' held at Hotel Taj Mahal Lucknow, 14th December 2024

CME – “Preserving Fertility: Awareness to Action'' held at Hotel Vivanta Guwahati, 21st December 2024

CME – “Preserving Fertility: Awareness to Action'' held at The Crown A1/(a) IRC Village, Nayapalli, Bhubaneswar, 28th December 2024



CME – “Preserving Fertility: Advancing Expertise in Patient Care and Decision-Making'' held at Lalit Ashok, Bangalore, 5th January 2025



CME – “Preserving Fertility: Awareness to Action'' held at The Hotel UK27, Belagavi, 16th February 2025

Delhi CME, 8th May 2025

Block Your Dates
FPSI Annual Conference Fertiprotect 2025
8-9 November 2025, Chennai

Thank You...