



Future Fertility

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ABSTRACT

Future Fertility or Fertility preservation is the effort to help cancer patients preserve their fertility or ability to produce offspring. Researchers are focused on how cancer can affect reproductive health and preservation options are growing and sparked in part by the increase in the survival rate of cancer patients. Many women of childbearing age and men who have been diagnosed with cancer think that preserving their fertility is important and they want information about their options. However, they may not feel comfortable bringing up fertility issues. Family member may not be aware of their options for preserving fertility. They may be focused on their diagnosis cancer and unable to think about the potentiality of having a future family. Women may later repentant not considering fertility issues prior to starting cancer treatment. Considering that there are fertility preservation options available and referring at-risk patients to specialists can improve patient's emotional thinking and future quality of life.

KEYWORDS : Fertility preservation, reproductive health, cancer patients, specialists, emotional thinking.

Definition:

Fertility preservation is the cryopreservation (freezing) of human reproductive tissue to be used later for in vitro fertilization (IVF) or intra uterine insemination (IUI) therapies.

With the use of liquid nitrogen, human tissues such as semen, gametocyte and embryos are frozen at temperatures exceeding 350 degrees below freezing and stored in specially designed reservoir. When the women or men is ready to begin a family, the tissues will be sent to an IVF clinic, unfrozen and used in a procedure by a licensed IVF doctor to fertilize the woman.

Who uses Fertility Preservation?

Fertility Preservation is normally used by patients concerned about their future fertility. Fertility can be altered a number of different factors such as disease, lifestyle, career or age. The ability to preserve human tissues is a great choice and often advised by doctors for cancer patients, high impact sports persons, Army personnel, transgender clients and Donor insemination has become safer because donated semen samples are frozen and quarantined for six months, at the end of which the donor is re-tested for evidence of the human immunodeficiency virus (HIV) infection, or for any of the other screened infections and . Regardless of the causes of infertility, cryostorage and cryopreservation are advances in the medical field that allow patients another attempt of having a family in an option that is priceless to many who have practically given up to get children.

Indications:

- Cancer patients before gonadal resection
- Other diseases before gonadal resection
- Donor insemination.
- Young patients with Turner syndrome, Fragile X permutation (FMR 1), Galactosemia
- Women in mid-thirties without partner?

Fertility Preservation for Cancer:

Patients who are diagnosed with cancer is one of the most shocking life events a person can face. While recent advance studies cancer therapy have given many patients hope and have lead to survival rates of approximately 66% treatments such as surgery, chemotherapy and radiation may have life-altering implications. For women and men of reproductive age group, cancer therapies can often lead to ovarian damage; impair spermatogenesis and premature menopause which can have significant impact on current and future fertility.

Advances in reproductive medicine, there are new technologies now available that can help to preserve fertility prior to undergoing treatment of cancer. The following of this provides a brief review of options. The decision to preserve fertility in the face of cancer is very difficult. Decisions regarding the timing of cancer treatment and disposition of the eggs, should the women not regain the health needed to carry a pregnancy, are never easy and require the support of family members, friends and the expertise of a wide range of health care specialists.

Future fertility options for Women and Men.**Egg Freezing**

Egg freezing provides one choice to preserve fertility prior to begin cancer treatment therapies. With egg freezing technology, multiple eggs can be harvested through the process of in-vitro fertilization (IVF) and frozen.

When the cancer is cured, the eggs can be unfreeze, fertilized and transferred to the uterus since most cancer treatments do not involve removal or damage to the uterus. However, there are some limitations to these therapies.

First, from the time of IVF treatment begins until the eggs are restored which takes 2-6 weeks. Delaying cancer treatment may not be provident in all cases and requires the input of the cancer therapies.

Second, if the cancer is estrogen -dependent, fertility treatments should be modified to reduce the impact of estrogen in the system that could accelerate the growth of the cancer. Other considerations include age of patient, the stages of cancer and whether the uterus will be removed or damage.

Ovary Transplant

It is alternatives therapies to egg freezing but is still very preliminary. Harvesting of ovarian tissue through laparoscopic surgery prior to cancer treatment with subsequent transplant has been done successfully, but reports of residual cancer cells in frozen tissue make this option less than optimal.

In Vitro Maturation

To harvest immature eggs from the ovary with or without limited hormonal stimulation and then grow the eggs in the laboratory until they are mature this process is called in-vitro maturation.

Embryo Freezing/Embryo Cryopreservation

The longest standing practice for women faced with fertility compromising therapies is to retrieve eggs through IVF, fertilize them with sperm and freeze embryos. Frozen embryos produce acceptable pregnancy rates and are a common part of IVF practice.

Sperm Freezing

When men undergo treatment for cancer including surgery, chemotherapy and radiation their reproductive potential is threatened. Cancer itself can also impair spermatogenesis. Sperm cryopreservation prior to initiating life saving treatments offers the opportunity to preserve the ability to father a child. Sperm can be stored indefinitely in liquid nitrogen, even in the setting of poor semen quality that is already impacted by the cancer itself.

Before Cancer Therapy:

All women are born with a finite number of eggs. Over time, there is a natural reduce in the number of remaining eggs until a woman reaches menopause. It is well known that cancer treatment can quickly and dramatically reduce a woman's supply of eggs, leading to premature menopause in 15-89% of patients after chemotherapy. Women receiving higher doses and different types of chemotherapy, those who are older particularly over age of 35 years at the time of treatment, and those with Hodgkin's disease are particularly at risk site. Because it is difficult to estimate whether a woman will be fertile after cancer therapy, it is important to review fertility preservation options before starting treatment.

What are the options of fertility preservation?

1. In Vitro Fertilization (IVF) and Embryo Freezing

Ideal option for:

- Women who have a male partner or are interested in using donor sperm.
- Women who can safely delay cancer treatment for 2-6 weeks.

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An embryo is an egg which has been fertilized by sperm. It is an excellent option for women who have a male partner or are interested in using sperm donor. It is typically involves hormonal stimulation, which starts at the beginning of a menstrual period and lasts for approximately 10-14 days to mature the eggs. Alternative methods of stimulation can be used if exposure to high estrogen levels is a concern or breast cancer patients. The eggs are removed by an ultrasound guided needle but procedure is done under sedation and then combined with the sperm. The resulting embryos can be stored indefinitely until the patient is ready to use them. The entire process takes between 2&6 weeks to complete.

2. Egg Freezing

Ideal option for:

- Women who do not have a male partner or are not interested in using donor sperm.

Women who can safely delay cancer treatment for 2-6 weeks.

Recent advances technologies have resulted in dramatic improvements in egg survival and pregnancy rates after egg freezing, and as of 2012, egg freezing is no longer considered experimental. At University of Southern California (USC) Fertility have established expertise with the technology, achieved 64% survival rate, 63% pregnancy rate, and 10 live births in initial study, and they have achieved many more live births since then. These findings are encouraging and suggest that new technology of freezing eggs may be as successful as freezing embryos. Because successful egg freezing requires experience and expertise, it should be performed only at centers with proven success with egg freezing technology. Like embryo freezing, this strategy typically requires a 10-14 day period of hormonal treatments to mature the eggs, thus making them suitable for freezing. It is a good option for patients who can safely delay their cancer therapy for two to six weeks.

3. Ovarian Tissue Freezing and In Vitro Maturation (IVM)

For patients whose cancer therapy cannot be delayed, ovarian tissue containing immature eggs can be removed by a laparoscopy surgery and preserved for future use. Because immature eggs cannot be fertilized, techniques to mature the eggs in the laboratory have been developed and refined over the past several decades, leading to consistent improvements in egg survival and fertilization. Reports of pregnancies and healthy live born babies resulting from these therapies in women without cancer and successful freezing of eggs matured in the laboratory in women with cancer indicate that this strategy holds promise for fertility preservation in female cancer patients. This is an option for those patients who cannot or do not wish to delay their cancer treatment. Similar to egg freezing, ovarian tissue freezing is considered investigation and should be performed responsibly under ethics board approved research protocols.

4. Fertility-Sparing Surgery

For women who require abdomen or pelvic radiation as part of their cancer therapy, it can be helpful to surgically move or suspend the ovarian transposition to minimize the amount of exposure to the radiation.

For women with ovarian or cervical cancer, fertility-sparing surgery may be an option depending on the type and stage of cancer. These surgical methods can be technically difficult and should only be performed by gynecology oncologists with considerable experience with such procedures.

5. Oophoropexy or Ovarian Transposition:

This procedure is normally done in reproductive age group who undergoing radiation to the pelvic region. This therapies involves surgically moving the ovaries to another place in our body, away from the field where the radiation therapy will be directed.

After Cancer Therapy:

The first course of action is to test for fertility, and then determine if assisted reproductive technology (ART) treatments are needed. These are information for women seeking to build families post-cancer therapy.

Testing fertility

Many women will begin again regular menstrual periods after treatment. However, this does not surely indicate that they are fertile. The most authentic way to assess fertility after cancer therapy is by measuring hormone levels in the blood i.e follicle stimulating hormone, estradiol and progesterone levels timed to specific phases of the menstrual cycle. An ultrasound of the ovaries can also be useful to approximate fertility potential.

What are the options?

- Fertility Treatment and Assisted Reproduction Technology (ART)
- Ideal option for women who are infertile or determined to have diminished fertility after cancer treatment
- Depending on the nature of the infertility, conventional methods of infertility treatment such as in vitro fertilization can be very successful.

Third-Party Reproduction Egg Donation:

Ideal option for women who are menopausal after cancer treatment

Egg donation is clearly successful fertility procedure that is available today. Women who are infertile or in menopause can still carry a pregnancy using eggs from known donor. In women with male partners, donor eggs can be fertilized with the male partner's sperm to create embryos that are genetically related to the male partner. In same-sex relationships, donor eggs can be fertilized with donor sperm. Some lesbian couples may elect to have the cancer survivor's female partner serve as the egg donor.

Gestational Surrogacy

Ideal option for women for whom carrying a pregnancy is not considered to be safe

Gestational surrogacy refers to a treatment process in which another woman undergoes the embryo transfer process and carries the pregnancy to term. The planned parents are involved with the pregnancy, are typically present at the birth, and take over parenting responsibilities immediately thereafter. In same-sex relationships, the female partner for whom carrying a pregnancy is considered to be safe can serve as the gestational surrogate for the female partner for whom carrying a pregnancy is not considered to be safe.

Safety of pregnancy after cancer

So far research on the safety of pregnancy after cancer is reassuring but further research is necessary to confirm these findings.

- **Mothers:** researcher suggests that pregnancy after cancer does not trigger recurrence, even after breast cancer.
- **Children:** The risk of birth defects in children born to cancer survivors is reported to be similar to that of the general public approximately 2-3%.
- Children born to cancer survivors do not appear to be at increased risk for getting cancer themselves (except in true inheritable cancer syndromes)

Role of a Nurse:

- Nurses working in infertility centres are the first contact persons who co-ordinates various activities for the couple's treatment. Their role includes assessing, educating and counselling in addition to therapeutic assistance as they undergo tests and procedures.
- When a couple presents with concerns about infertility, it is important for the nurse to understand that men and women are very concerned and possibly emotionally fragile.
- Provide the couple with factual information to assist in their decision making process.
- Empower the couple in the establishment of realistic expectations at each point in the process.
- Provide the couple with emotional support critical to the successful completion of evaluation and treatment, regardless of the final outcome.
- Nurses need to be update regarding the advancement in infertility technology to be able to inform infertile couples during the counselling sessions.

Conclusion

Fertility preservation in cancer patients can only be approached with a multi disciplinary setting. Increasing long term survival rates along with advances in fertility treatment means that it is now everlasting that fertility preservation should be offered to these patients. However, the patients must be willing to take the venture and the surgeon must be anxious to offer the treatment available. Surely this kind of trembling will be felt while undertaking any treatment programmes on human beings. There are many obvious challenges and ethical issues that still need to be resolved especially in the area of fertility preservation in before puberty patients

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