Fertility preservation around cancer treatment

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Chemotherapy, radiotherapy and aggressive surgical techniques have improved survival from cancer but in those of reproductive age, loss of fertility is often an adverse consequence. A significant proportion of cancers occur in those of reproductive age (<45yrs); 23% of leukemias, 84% of testicular cancers and 13% of breast cancers. Many are now living with the long-term effects of cancer treatment, and preservation of fertility is a major issue to both men and women. Age and gender impact strongly on both cancer and the available fertility-sparing options. Usually limited time is available so discussion of fertility must commence shortly after diagnosis. The options provided by a fertility specialist are complemented by modified treatment regimens (which are not covered here).

Protecting male procreation

Pretreatment cryopreservation of semen provides sexually mature male patients with excellent future pregnancy rates with their partners. Testicular cancer and Hodgkin's disease are often associated with poor semen quality prior to treatment but modern fertility techniques such as intracytoplasmic sperm injection (ICSI) still achieve good pregnancy rates.

Pretreatment cryopreservation of semen, with as many samples as time will allow, should be encouraged for any male cancer where future fertility is desired. Sperm quality is maintained despite storage for extended periods e.g. 10 years. Treatments for males not yet mature enough to produce sperm by ejaculation, such as maturation of sperm from cryopreserved testicular tissue, are still experimental and hormonal therapies have not been helpful in maintaining spermatogenesis.

Protecting female procreation

Female patients have important social factors to consider. A woman already in an established relationship has the best chance of achieving this from embryo cryopreservation, with pregnancy rates of 20-30% from thawed embryos. For single women there is oocyte cryopreservation, yielding pregnancy rates of 2-3 % per thawed oocyte.

These treatment options require a stimulated IVF cycle that takes 2-6 weeks for completion, and theoretically poses a risk for those with a hormonally sensitive tumour such as breast cancer. Although there is no evidence of reduced oncological response rates in those undertaking an IVF cycle it is prudent to minimise estrogen exposure by modifying the IVF protocol e.g. use of letrozole, tamoxifen or natural cycle IVF.

Hormonal suppression of the ovary with GnRH agonists to produce a pseudo-menopause state may have some benefit in preserving ovarian activity if administered during chemotherapy. This is an 'off label' treatment that is expensive for patients out of the public sector.

Still experimental is the taking of small strips of ovarian tissue at laparoscopy, for cryopreservation, and later reimplantation and stimulation. This technique runs the theoretical risk of reintroducing malignant cells and is not reccomended in leukaemia patients. Six live births have been reported in the world literature.

Oocyte donation and adoption are available options for women who have lost ovarian activity. Surrogacy is now available in Western Australia and is suitable when ovarian activity is preserved but the uterus has been lost e.g. cervical cancer.

References:

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