

Fertility after cancer in men

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The incidence of cancers commonly diagnosed in the adolescent and young adult population, including Hodgkin and non-Hodgkin lymphoma, acute lymphocytic leukemia and testis cancers, is on the rise worldwide.¹⁻³ Simultaneously, the latest combination chemotherapy regimens have improved the survival rates of these patients to greater than 75%–90%, making it possible for many of these young cancer survivors to form a family. Unfortunately, cytotoxic cancer therapies can negatively affect sperm production and a significant proportion of cancer patients may become azoospermic following chemotherapy. Sperm banking is currently the only reliable strategy to preserve fertility in male patients who undergo chemotoxic therapies for cancer. However, the rate of sperm banking among cancer patients remains low.⁴⁻⁷

In this issue of *CUAJ*, Selk and colleagues⁸ report that the use of cryopreserved sperm, taken from cancer patients before chemotherapy, with assisted reproductive technologies yielded high pregnancy rates. This information is not only encouraging to cancer survivors, but it also highlights the importance of oncologists' awareness of this information so that they can provide proper counselling to young cancer patients on fertility preservation before they undergo cytotoxic cancer therapies.

Fertility preservation for cancer patients is truly an "interdisciplinary" service, in that most fertility specialists who are experienced in counselling infertile couples may not have the necessary expertise to address the specific concerns and needs of young men with newly diagnosed cancer. Likewise, most oncologists may not be fully aware of the latest advances in fertility treatment options, particularly of the fast-growing area of assisted reproductive technologies. My research group has previously reviewed the various factors that can affect the use of sperm banking facilities.⁹ Having a dedicated reproductive medicine specialist as part of an oncology team can certainly increase the likelihood of acceptance by patients of sperm banking before chemotherapy. The difficulty in helping cancer patients to accept sperm banking and the complex psychosocial stress these patients experience clearly call for a multidisciplinary approach in the management of

young cancer patients with regard to fertility preservation, which is one of the most important issues in cancer survivorship.

To facilitate the process of fertility preservation, treating physicians should familiarize themselves with the protocol of sperm banking at their institutions. Detailed information about prebanking serology blood tests; the consenting procedure, including policy for disposal of banked semen; cost; liaison personnel for urgent sperm banking; and so on, should be updated regularly and disseminated to all staff who treat cancer patients.

Despite the encouraging findings of Selk and colleagues,⁸ several questions on the topic remain to be answered. First, although the negative impact of chemotoxic cancer therapies on reproduction is largely dependent on the cancer and the dose, types and duration of cancer treatment, the likelihood of recovery of spermatogenesis after treatment for an individual patient is not always predictable. Thus identification of factors, possibly through multivariate analysis from large-scale longitudinal studies, may help with counselling these cancer patients on the risk of infertility following cancer therapy. Second, if sperm production recovers after chemotherapy, should the fresh sperm or the cryopreserved sperm be used for reproduction? On the one hand, fresh sperm after cancer treatment are derived from spermatogonia that have been exposed to chemotoxic therapy with the potential of damage in their genetic materials. On the other hand, we have demonstrated recently that there is significant impairment in the sperm chromatin quality in men with Hodgkin lymphoma and testis cancer even before chemotherapy.¹⁰ Long-term follow-up studies, using live-birth rate and postnatal health as outcomes, will be required to answer this question. Finally, although sperm cryopreservation may be feasible in adolescent patients with cancer, for preadolescent patients who have not begun spermatogenesis, no fertility preservation option is currently available with clinically proven efficacy. Harvesting of spermatogonial stem cells for these patients before chemotherapy for future transplantation has been explored as an option¹¹ but further studies are required before this technology is applicable to humans.

Young cancer survivors represent an existing and growing population. The joint venture of oncology and reproductive medicine in advancing the quality of care to these patients will no doubt continue to enhance the quality of life of these young cancer survivors.

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