An increasing number of young women suffering from leukemia and other malignant and non-malignant disorders are being cured by stem cell transplantation (SCT). Improved survival introduces the long-term consequences of SCT, including fertility issues.

Pregnancies following SCT are still rare. The options for conceiving include spontaneous conception and in vitro fertilization with donated or the mother’s own eggs (with embryo cryopreservation before or after chemotherapy). Harvesting and freezing unfertilized eggs is technically difficult and frequently unavailable.

Most pretransplant conditioning protocols for SCT include alkylating agents, irradiation, or both. Either of these options can injure germ cells and cause infertility. Thus, almost all women become infertile immediately after SCT due to damage to the ovaries. Some women become permanently infertile; others recover fertility. Recovery of ovarian function and fertility has been shown to depend on several factors. The most important risk factors for development of ovarian failure are advanced age at time of first treatment and the number of cycles with alkylating agents and irradiation.

All alkylating agents have toxic effects on the ovaries. These effects have been mostly documented with cyclophosphamide. Irradiation doses as low as 4 Gy destroy about 50% of oocytes. Use of alkylating agents combined with irradiation below the diaphragm causes more pronounced damage. Women more often recover fertility if their irradiation regimens do not affect the whole body and if they are younger than 25 years.

In allogeneic SCT, recovery of ovarian function ranges from 14% to 24%, and the interval from SCT to first spontaneous menstruation ranges from 21 to 87 months (median 49 months). Recovery rates as high as 84% have been reported among patients with favourable predictors. These patients were young,
In the future, alternative chemotherapeutic regimens with lower doses of alkylating agents need to be investigated for women who wish to become pregnant after SCT, at least until oocyte or ovarian cryopreservation becomes routinely available.

References


Motherisk questions are prepared by the Motherisk Team at the Hospital for Sick Children in Toronto, Ont. Drs Schechter and Finkelstein are members and Dr Koren is Director of the Motherisk Program. Dr Doyle is Director of the Bone Marrow Transplant Unit at the Hospital for Sick Children. Dr Koren, a Senior Scientist at the Canadian Institutes of Health Research, is supported by the Research Leadership for Better Pharmacotherapy during Pregnancy and Lactation and holds the Ivey Chair in Molecular Toxicology at The University of Western Ontario.

Do you have questions about the safety of drugs, chemicals, radiation, or infections in women who are pregnant or breastfeeding? We invite you to submit them to the Motherisk Program by fax at (416) 813-7562; they will be addressed in future Motherisk Updates.

Published Motherisk Updates are available on the College of Family Physicians of Canada website (www.cfp.ca). Some articles are published in The Motherisk Newsletter and on the Motherisk website (www.motherisk.org) also.