Fertility Preservation in Men With Cancer: Issues and Benefit of an Established Program

Written by Mary Mosley

Cancer care has evolved to a focus on quality of life after treatment, in addition to survival, making fertility preservation (FP) a survivorship issue. A large proportion of patients who survive cancer want to become biological parents, but evidence from surveys and a retrospective review revealed low rates of discussion about FP within usual cancer care. Robert E. Brannigan, MD, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, USA, reviewed the success of integrating a formalized oncofertility program into acute cancer care at his institution and in improving the rates of FP. An important issue is improving the rates of FP in adolescent and young men.

Some 50% of men will receive cancer diagnoses in their lifetimes, said Dr. Brannigan. The incidence of cancer for males increases with age across the range from 0 to 45 years. Both the underlying cancer and cancer treatment can contribute to infertility. In young men with certain types of cancer, low fertility is seen at presentation, before treatment is started.

Sperm cryopreservation (SPC) has been underused, because physicians do not think there is sufficient time for it while addressing other acute health issues and because of the historically poor outcomes for cryopreserved sperm and low pregnancy rates after intrauterine insemination. However, markedly smaller numbers of sperm must be banked by a patient to achieve reproductive success with *in vitro* fertilization and intracytoplasmic sperm injection (ICSI).

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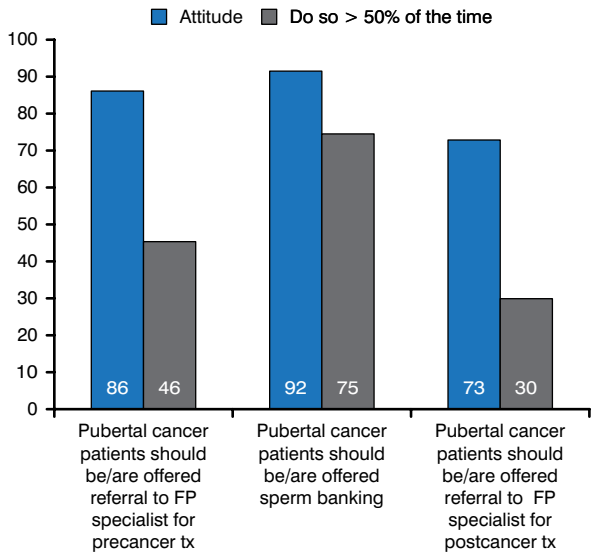
The American Society of Clinical Oncology (ASCO) Recommendations on Fertility Preservation in Cancer Patients called for physicians to discuss the risk for fertility impairment as early as possible and for prompt referral to a qualified specialist if the patient is interested [ASCO. *J Oncol Pract* 2006]. The ASCO recommendations were in part a response to the discordance between physician and patient perspectives on the discussion of fertility issues. All physicians reported that they discussed fertility issues with their cancer patients, and 26% reported being familiar with ICSI in a 1999 ASCO member survey in Minnesota [Zapzalka DM et al. *Cancer* 1999]. However, in a survey of 904 men (of whom 201 responded) aged 14 to 40 years with cancer, only 60% reported that they had been informed about fertility issues and 51% about sperm banking [Schover LR et al. *J Clin Oncol* 2002]. Furthermore, overall 51% reported that they wanted children after they were cured, and this number was 77% for those without children at the time of the survey. Sperm was banked by 24% overall and by 37% of those without children.

A lower rate (44%) of awareness of the ASCO recommendations was reported in the Survey for Preservation of Adolescent Reproduction study [SPARE] by 209 physicians treating the pediatric cancer population [Köhler TS et al. *J Assist Reprod Genet* 2011]. In this study, 93% of the respondents were pediatric oncologists, 79% had university-based practices, and the most commonly treated cancers were leukemia, lymphoma, and brain tumors. Familiarity with ICSI was reported by 56% and with current FP research by 67%. Although >80% agreed or strongly agreed that fertility risk was a major concern to clinicians and the parents of male patients, and that patients and their parents had asked about the risk to fertility, >60% of the physicians reported that they never used the 2006 ASCO recommendations on FP or used them in <25% of cases. The discordance between physician attitudes and practice regarding FP in SPARE is illustrated in Figure 1.

A retrospective review at Northwestern University showed that 30 of 32 male pediatric patients (mean age, 16.6 years) were able to provide samples for sperm banking and that 28 (88%) successfully banked sperm [Sharma V et al. American Urological Association 2012 (abstract 1372)]. Compared with the World Health Organization reference standard, the semen parameters in these patients were at or near the cutoffs, and even in the younger patients, they were at levels sufficient for assisted reproduction.

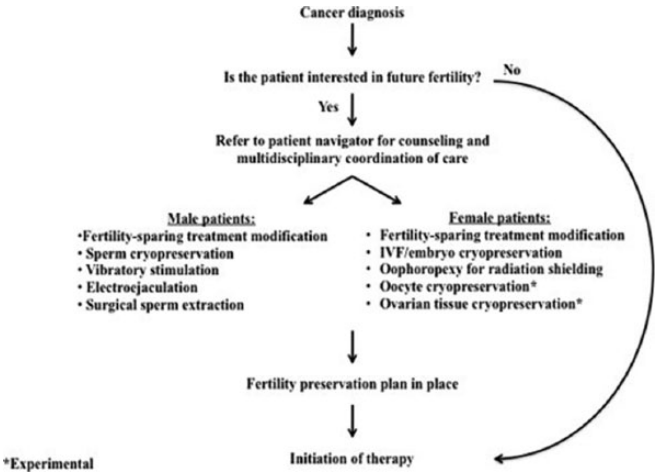
Figure 1. Discrepancy Between Attitudes and Practice Pattern for Fertility Preservation



FP=fertility preservation; tx=treatment.

Reproduced from Köhler TS et al. Results from the Survey for Preservation of Adolescent Reproduction (SPARE) study: gender disparity in delivery of fertility preservation message to adolescents with cancer. *J Assist Reprod Genet.* 2011;28:269–277. With permission from Springer.

Figure 2. The Patient Navigator Model for Fertility Preservation in Patients With Cancer



IVF=*in vitro* fertilization.

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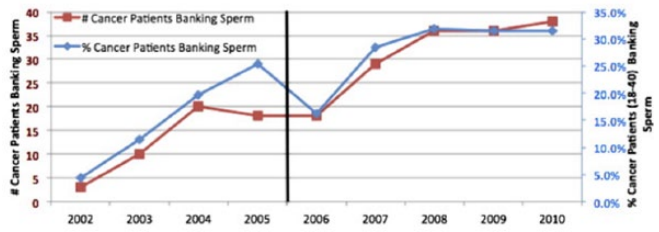
Figure 3. Number and Percentage of Patients With Cancer Aged 18 to 40 Years Banking Sperm



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ONCOFERTILITY PROGRAM

Northwestern University established a formalized oncofertility program in 2005 to improve FP in male patients with cancer [Sheth KR et al. *J Urol* 2012]. The program comprised a multidisciplinary team, a patient navigator, and a complete FP consultation. The team included urologists, endocrinologists, hematologists, oncologists, and laboratory staff members, as well as pediatric oncologists, nurses (urology, oncology), psychologists, and administrative staff members. The referring physician is a key member of the team, noted Dr. Brannigan. A patient navigator guided patients through the FP process during their cancer treatment (Figure 2) [Redig AJ et al. *Cancer* 2011]. A complete FP consultation was conducted, including a history, a physical examination, a discussion about their reproductive goals, and counseling.

The program improved FP in male patients with cancer [Sheth KR et al. *J Urol* 2012]. Among men with cancer aged 18 to 40 years, from 2002 to 2010, the proportion who were offered FP consultation increased from 23.4% to 43.3%, and those who underwent SPC increased from 15.2% to 27.9% (Figure 3). The increase in SPC was consistent across all types of cancer. The number of men who were diagnosed with cancer during this time period remained constant.

SPC by men with cancer has been shown to successfully result in pregnancy. In a study of 118 couples who underwent 169 IVF cycles, there was a 56.8% rate of pregnancy per retrieval [Hourvitz A et al. *Fertil Steril* 2008]. Ninety-six pregnancies led to the births of 126 children.

Dr. Brannigan noted that increased efforts are needed to address the issue of fertility risk in patients from minority groups and in adolescents, particularly prepubertal patients. Education materials are needed that are appropriate for the age and maturity of prepubertal patients, and providers who are comfortable delivering this information. Sperm production from testicular or other tissue, aided by technology, is a future goal to address the fertility risk in these young patients.