

Research Article

Evaluating Attitudes and Knowledge of Fertility Preservation among Gynecologic Oncologists

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Abstract

Aims: To examine gynecologic oncologists' (GO) practice patterns and knowledge of fertility preservation (FP) and fertility sparing treatment (FST) among patients with gynecologic malignancies.

Methods: Society of Gynecologic Oncology members were anonymously surveyed regarding demographics, practice patterns, access to reproductive endocrinologists (RE), and FP knowledge. Descriptive statistics were calculated. Passing score on scenario-based questions was 4 or higher. Associations between sociodemographic variables and test scores were analyzed using linear regression.

Results: 82 GO (8%) completed the survey. Median age was 43. Most were female (72%), white (92%), practiced at an academic institution (57%), had practiced 10 or fewer years (56%), and had access to RE (61%). Most felt comfortable counseling on FP (83%) and nearly all (99%) reported they were likely to discuss desire for fertility prior to treatment. Most felt they had adequate or better training on FP during fellowship (77%). The mean score on scenario questions was 68% (mean of 3.4/5, SD. 0.84, range 1-5). Of the respondents (n = 68) stating they were comfortable or very comfortable counseling FP, 35 (51%) passed the scenario questions. 8 (12%) who reported feeling very comfortable or comfortable counseling on FP failed the test (score 1-2). 4 respondents scored 100% on the test. Linear regression did not show significant relationships between sociodemographic characteristics.

Conclusions: GO report confidence counseling FP and readily assess patients' desire for fertility, but only half passed scenario questions. This may indicate a potential educational gap within the field. Opportunities for improved FP training exist and there is a need for continued collaboration with RE providers.

Keywords: Oncofertility, Infertility, Young Adult Cancer and Gynecologic Oncology.

1. Introduction

Survival rates of reproductive-age cancer patients continue to improve with advances in early cancer diagnosis and new cancer treatment modalities. Despite improvements in cancer outcomes, reproductive-age females face many challenges as they navigate their cancer journey. The deleterious effects of chemotherapy and radiation to female reproductive and endocrine organs are well established, and include depletion of primordial follicles, menstrual irregularities, anatomic or vascular changes to pelvic organs, abnormal development of secondary sexual characteristics, premature menopause, and infertility [1]. Gynecologic oncologists (GO) are often the initial providers counseling newly diagnosed gynecologic cancer patients as they make difficult decisions regarding how to best balance desire for future fertility with optimal oncologic outcomes [2, 3]. Although fertility preservation (FP) and fertility sparing treatment (FST) have been in use for decades, challenges still exist in implementing

these measures among oncology patients [4]. One concern that may deter oncologists and patients from considering FP is the possibility of a delay in treatment or worsening oncologic prognosis and outcomes [5]. Furthermore, the lack of FP knowledge, centralized resources regarding FST, and access to reproductive endocrinology (RE) services for oncology patients adds complexity to the already difficult task of navigating a patient's course of care. Female FP is also a complex and time-consuming process, at times requiring several weeks to complete. As a result, male cancer patients are five times more likely to undergo FP than their female counterpart [6].

In addition to time constraints, other factors may hinder pursuit of FP including age of the patient, pubertal status, partner status, cultural views, health literacy, healthcare disparities, and psychosocial factor [7].

Reproductive-aged cancer patients not only have to face the day to day logistical hurdles of FP and FST but must also face the potential loss of fertility. These experiences have a negative psychosocial impact on patients. Multiple surveys of cancer survivors have demonstrated increased emotional distress, including anxiety, depression, grief and stress, in relation to losing their fertility post treatment [8, 9]. Research has shown that women who undergo FP counseling or FST have reduced risk of regret regarding their fertility goal [10, 11]. Consequently, organizations, such as the American Society of Reproductive Medicine (ASRM) and the American Society of Clinical Oncology (ASCO), have established guidelines encouraging oncologists to communicate risks of gonadotoxic therapies to patients, options for fertility preservation (FP) and offer referrals for not only reproductive services but also mental health counselors [12]. Despite these recommendations, FP services and referrals remain underutilized. Studies have shown that less than half of reproductive-age cancer patients recall FP discussion or referral being placed. Of those who do recall discussion of FP, many were left unsatisfied regarding the information they were provided [8, 13]. GO should be equipped to discuss both FP and FST and the negative sequelae of cancer therapy on reproductive health to the same degree cancer treatment is discussed regardless of a patient's reproductive desires at time of cancer diagnosis. While the utility of FP should be weighed against morbidity and mortality associated with gynecologic malignancy, there is a strong need for multidisciplinary collaboration between gynecologic oncologists and reproductive endocrinologists to improve awareness and availability of resources for patients [14].

The multidisciplinary field of oncofertility has emerged in an attempt to make fertility preservation a mainstay of cancer therapy [15]. ASRM and ASCO recommend that providers caring for adult and pediatric patients with cancer should assess the possibility of infertility before treatment starts, refer patients who express interest in fertility to reproductive specialists, and discuss fertility preservation approaches as early as possible and before treatment starts [16]. As the field of oncofertility grows, barriers hindering broader access to fertility counseling and treatment for patients impacted by cancer must be identified.

Prior studies have sought to examine GO utilization and collaboration of RE services. A single institution study found that despite 68% of providers knowing FP services were available, 63% were not familiar with FP resources at their institution and 79% did not know which patients qualify for FP referral [17]. Another study examined factors influencing FST for GO and determined that the number of reproductive-aged patients seen, geographic location, and practice setting were significant variables influencing GO practice [18]. The purpose of our study was to assess GO practice patterns in relation to access to RE services and to assess knowledge base relating to FP options among patients with gynecologic malignancies. Understanding FP practice patterns, interdisciplinary efforts amongst GO and RE providers, and knowledge base of GO providers may identify opportunities to optimize access to FST and reproductive outcomes in this patient population.

2. Materials and Methods

This study was an Institutional Review Board (IRB) approved online survey of gynecologic oncologists regarding their attitudes and knowledge of fertility preservation. By completing the online survey, participants consented to be in the study.

SGO members categorized as full member gynecologic oncologists were identified using the SGO email mailing list. Study data were collected and managed using Research Electronic Data Capture (REDCap) electronic data capture tools hosted at our institution. REDCap is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources [19, 20]. The survey took approximately 10-15 minutes to complete and potential participants received up to two email reminders to complete the survey.

The survey (see supplementary materials) consisted of questions assessing respondents' basic demographics which included respondent's age, race, gender, type of practice, and time since completion of fellowship. In addition, survey respondents were asked about the presence of reproductive endocrinology services at their institution, ease of access to making RE referrals, their background of fertility preservation training, comfort discussing FP, and comfort with specific FST modalities. Participants were then asked to complete a series of five scenario questions regarding FST. The scenario questions tested knowledge of five common fertility preservation modalities – including oophoropexy, embryo cryopreservation, ovarian tissue cryopreservation, gonadotoxicity of chemotherapeutics, and radical trachelectomy. Following completion of the survey, respondents were given answers to the scenario questions as well as cited sources.

IBM SPSS Statistics version 28 was used for the statistical analysis. Descriptive statistics were calculated. Scores for each of the scenario-based questions were calculated per coding instructions for each question. A passing score on the scenario-based questions was 4 or higher. Associations between sociodemographic variables and test scores were analyzed using linear regression.

3. Results

A total of 1200 surveys were sent to SGO members, 82 of which were completed with a response rate of 8%. Surveys were excluded from analysis if respondents did not fill out the survey in its entirety. The survey included questions about basic demographic data, practice characteristics, knowledge of fertility preservation techniques, utilization of RE services, and five scenario questions.

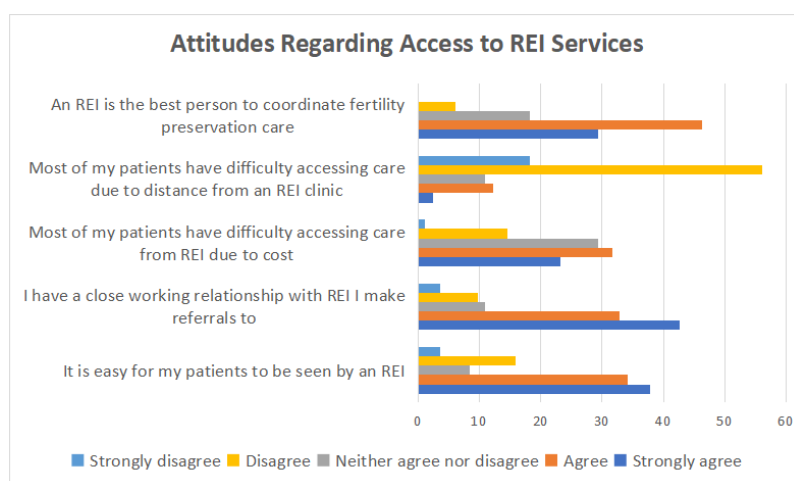
The median age of respondents was 43, the majority of respondents were female ($n = 59, 72\%$) and white ($n = 75, 92\%$). Most described their practice as academic ($n = 47, 57\%$) and in an urban environment ($n = 60, 73\%$). The majority had been in practice 10 or fewer years ($n = 46, 56\%$). See table 1 for survey demographics.

Table 1: Demographics.

Variable	N	%
Median age, years (range)	43 (33 – 68)	-
Gender		
Female	59	72%
Male	21	26%
Prefer not to answer	2	2%
Race		
White	75	92%
Asian	3	4%
Black	2	2%
Multi-racial	1	1%
Other	1	1%
Type of practice		
Academic	47	57%
Private practice	12	15%
Mixed	23	28%
Location of practice		
Urban	60	73%
Suburban	18	22%
Rural	4	5%
Years in practice		
More than 15 years	23	28%
11 to 15 years	13	16%
5 to 10 years	20	24%
Less than 5 years	26	32%

The majority of respondents indicated they had RE services at their institution ($n = 50, 61\%$), agreed it was easy for their patients to see an REI ($n = 59, 72\%$) but also felt patients had difficulty accessing REI due to costs ($n = 45, 55\%$). Three fourths of respondents endorsed having a close working relationship with the RE physician group at their institution

and felt that the RE provider was the best person to coordinate FP care. Almost half ($n = 36, 44\%$) were not comfortable at all discussing financial assistance services for fertility treatments. See figure 1 regarding attitudes regarding access to RE services.

**Figure 1: Attitudes regarding access to REI services**

Most felt comfortable counseling on options for FP (n = 68, 83%) and nearly all respondents (n = 81, 99%) reported that they were likely to assess a patient's desire for future fertility prior to discussing treatment. Most felt that they had adequate or better training on FP during fellowship (n = 63, 77%).

Survey respondents were also asked directly about their knowledge of FP techniques. Nearly a quarter of respondents felt familiar with oocyte and embryo cryopreservation but felt they lacked knowledge about the topic. Less than half felt knowledgeable or very knowledgeable regarding ovarian tissue cryopreservation (n = 33, 40%). All respondents felt familiar to very knowledgeable regarding ovarian transposition prior to pelvic radiation. See figure 2 regarding knowledge of FP techniques.

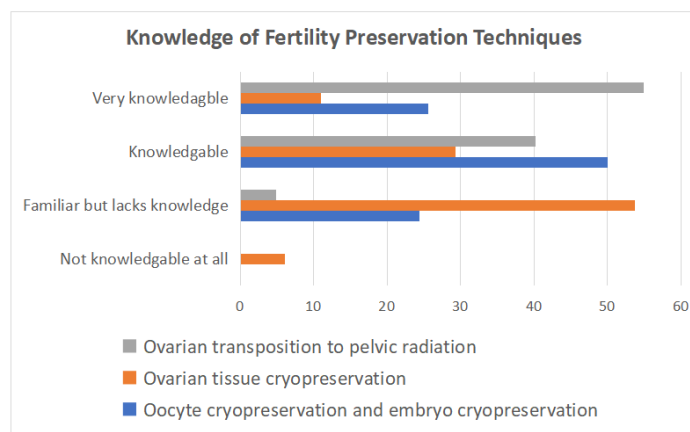


Figure 2: Personal knowledge of fertility preservation techniques displayed at percentage of indicated responses.

The mean score on a series of scenario questions regarding FST was 68% (mean of 3.4 out of 5, STD Dev. 0.84, range 1-5). Of the respondents (n = 68) who stated they were comfortable or very comfortable counseling on FP, only 35 (51%) passed the scenario questions. Eight respondents (12%) who reported feeling very comfortable or comfortable counseling on FP failed the test (score of 1-2). Only 4 respondents scored a 100% on the test. Linear regression examining the relationship between sociodemographic characteristics and test scores did not demonstrate significant relationships. See figure 3 regarding percent correct responses to scenario questions.

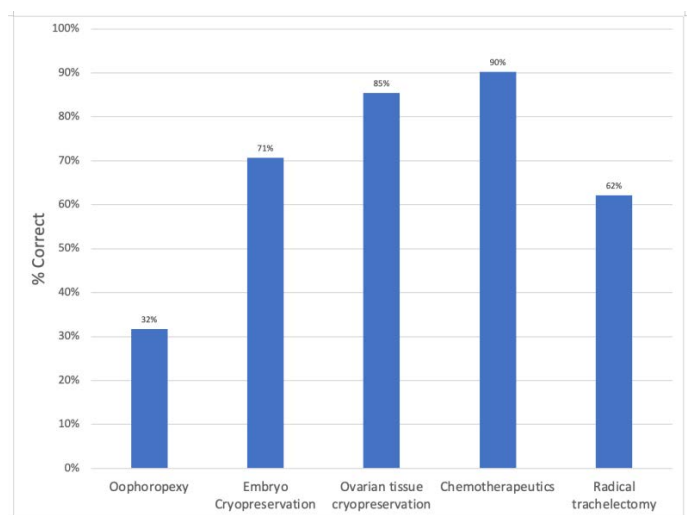


Figure 3: Response of scenario questions

4. Discussion

Improved cancer detection and treatment has resulted in higher rates of cancer survivorship, particularly for reproductive-aged patients. The reproductive needs of this growing population have fueled the creation of the field of oncofertility and need for multidisciplinary engagement between oncology providers and reproductive specialists. As such, GO providers must rapidly adapt to evolving guidelines and treatment modalities. In this study, we found that despite self-perceived comfort with counseling on FP, there was inadequate oncofertility knowledge among survey respondents. This deviates significantly from other studies in which GO report inadequate oncofertility knowledge and desire for more education in this field [15, 21]. Our survey analysis did not demonstrate any significant sociodemographic variables that directly correlate to a GO knowledge base regarding FP techniques.

The findings of this study suggest potential overconfidence regarding the topic of FP among GO. Physician overconfidence has garnered much attention within medical literature and has been shown to lead to misdiagnoses, inappropriate treatment choices, and the potential for poor patient outcomes [22, 23]. The fast-paced evolution of medical knowledge and advancing technology within the field of oncofertility means that what was once standard practice can quickly become outdated. Our survey highlights the need for continued educational interventions to improve GO knowledge regarding FP topics so that they may better counsel their patients on cutting edge technology.

There are several limitations to this study. It is most significantly limited by the small sample size and low response rate of 8%. This likely resulted in selection bias in our sample, with those more interested in FP topics being more likely to respond. Unfortunately, unincentivized physician surveys are often characterized by low response rates. Reasons for poor response rates include a lack of time, length of the survey, perceived salience of the study, concerns about confidentiality of the results, perceived bias in questions, or lack of appropriate answers on the subject. There is not a uni-

versally accepted response rate for an unincentivized study, however response rates usually fall between 6-20% [24, 25]. The low response rate demonstrated may also suggest a general disinterest in the topic of FP and FST among GO. Although this study is limited by its small sample size and low response rate, it is the first to our knowledge to directly test knowledge of GO with scenario-based questions.

Further limitations of this study include the demographics of our population. Our respondents were primarily young white women in academics. While this demographic is similar to the demographics of the recent SGO 2020 State of the Society Survey (54% female, 70% white), there is significant work needed to enhance diversity, equity, and inclusion within the specialty of Gynecologic Oncology. Furthermore, while we sought to ask questions based off common FP topics, the questions included may not be the most accurate way to establish knowledge base [26].

This study indicates that GO may have a notable knowledge gap concerning FP and FST. While most GO have access to RE providers within their institution and express confidence in counseling on FP and FST, many were unable to correctly answer questions regarding FP practices. Lack of knowledge on these topics may hinder coordination of care with RE providers and patients' access to oncofertility care. With improved diagnosis and treatment of gynecologic cancer comes an increased number of reproductive aged survivors, who are at risk for disparate outcomes in terms of future fertility. Our study indicates that GO may not be well trained on FP topics during fellowship and may not be able to adequately discuss FP issues with patients. This study provides the base for understanding GO knowledge barriers to FP [27]. A better understanding of these barriers to FP knowledge will allow for us to find ways to improve GO education regarding FP topics. The ultimate goal being giving our patients a better understanding of their FP options. We must work to improve GO knowledge of oncofertility. Further research examining barriers to FP and how to better standardize oncofertility education across GO fellowship training may improve GO knowledge on FP topics.

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