

Demographic Disparities Related to Fertility Preservation Counseling Among Patients Undergoing Bone Marrow Transplantation

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Introduction

Infertility is a well-documented adverse effect associated with certain chemotherapeutic agents and radiation therapy. High-dose chemotherapy and/or total body irradiation (TBI) are utilized in preparation for bone marrow transplant (BMT), with the intent of achieving complete myeloablation prior to transplant. Given this necessary exposure to high-dose chemotherapy and TBI, both male and female patients undergoing BMT are therefore at extremely high risk of impaired fertility later in life.

Discussions concerning fertility preservation are often psychologically challenging for patients preparing to undergo BMT. To address these concerns, many institutions have developed fertility preservation counseling programs that aim to provide patients and caregivers with the necessary information to make informed decisions regarding fertility preservation. As is the case with many resources in healthcare, certain populations have more access to these resources than others. The goal of this study was to gain insight into whether demographic features such as age, race, socioeconomic status, and underlying diagnosis/indication for BMT impacted the likelihood that a patient received fertility preservation counseling prior to transplant.

Hypothesis

It was hypothesized that there would be statistically significant differences in the rates of fertility preservation counseling when patients are compared by age, gender, race, socioeconomic status, and underlying diagnosis.

Methods

A pre-existing database of BMT patients treated at the University of Rochester Medical Center was used to generate a study population of 244 patients between the ages of 0-39 years old who underwent BMT between 2012-2020. Demographic features including age, gender, race, insurance type, zip code, and indication for transplant were extracted from the database. A retrospective chart review was then conducted to identify if patients had a visit with a reproductive endocrinology and infertility (REI) specialist, or if any documented fertility preservation counseling occurred prior to transplant. Odds ratios were then calculated for each of the aforementioned independent demographic variables.

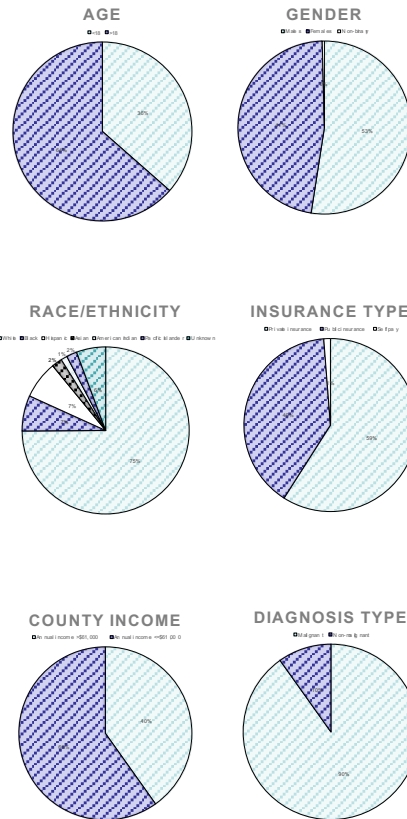


Figure 1. Demographic information including age, gender, race/ethnicity, insurance type, county income, and diagnosis type was collected from the electronic medical record for each study patient.

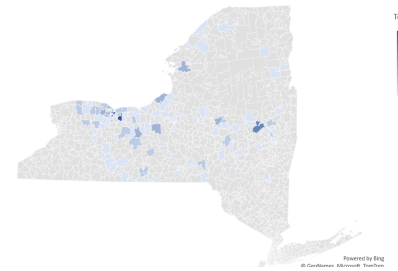


Figure 2. Heatmap of study participants' county of residence at the time of transplant.

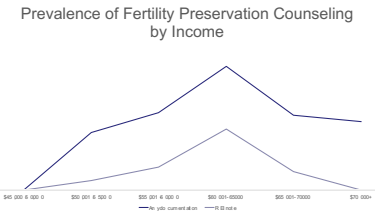


Figure 3. Fertility preservation counseling was more prevalent among participants who lived in zip codes where the average annual income was >\$60,000.

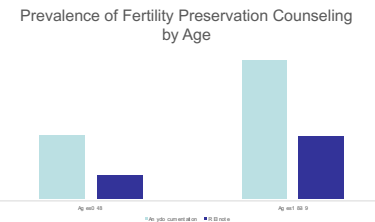


Figure 4. Patients over the age of 18 were more likely to receive fertility preservation counseling than patients under the age of 18 at the time of transplant.

Results

The overall prevalence of documented fertility preservation counseling was low.

- Approximately 20% of patients had a documented REI visit.
- Approximately 47% had any form of documented fertility preservation counseling.

There were differences in the prevalence of fertility preservation counseling related to patient age at transplant and median county income.

- Adult patients (age >18 years) were more likely than pediatric patients (age <18 years) to have a documented visit with an REI specialist (OR 2.99, 95% CI 1.37-6.51, $p=0.0059$), and were more likely to have any documented fertility preservation counseling (OR 3.49, 95% CI 1.97-6.16, $p<0.0001$).

- Patients living in counties where the median income was >\$60,000/year were more likely than patients living in counties with a median income of <\$60,000/year to have a visit with an REI specialist (OR 4.25, 95% CI 1.89-9.54, $p=0.0005$) or any documented fertility preservation counseling (OR 2.72, 95% CI 1.59-4.64, $p=0.0002$).

There were no statistically significant disparities in the prevalence of fertility preservation counseling based on patient gender, race, insurance type, or indication for transplant.

Discussion

These findings demonstrate that there are statistically significant differences in the prevalence of documented fertility preservation counseling based on demographic features, specifically on the basis of age and socioeconomic status.

It is unclear if these findings represent the true prevalence of fertility preservation counseling, as some counseling is likely not adequately documented in the electronic medical record.

Future studies are needed to design and implement improved fertility preservation counseling mechanisms, and to ensure adequate documentation of this counseling.

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