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Title:

KNOWLEDGE, ATTITUDES, AND CONCERNS OF INDIVIDUALS WITH CANCER-PREDISPOSING MUTATIONS REGARDING FERTILITY PRESERVATION AND PREIMPLANTATION GENETIC TESTING

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Objective:

Carriers of inherited cancer causing mutations, such as BRCA, require vigilant screening to prevent cancer-associated morbidity and mortality. Women who have not completed childbearing may opt to undergo fertility preservation with oocyte or embryo cryopreservation, particularly prior to undergoing risk-reducing surgery involving the removal of reproductive organs. Preimplantation genetic testing for monogenic disorders (PGT-M) may be performed prior to embryo cryopreservation to allow for selection of embryos without a mutation, to avoid the propagation of cancer risk to future offspring. Early use of IVF-PGT may also help to prevent future infertility due to age-related decline in ovarian reserve, which may be more pronounced in BRCA carriers. The purpose of this study was to survey individuals that carry cancer-predisposing mutations regarding their knowledge and opinions on fertility preservation and PGT-M in order to identify key factors which impact their reproductive decision-making.

Design:

Prospective, survey study



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Materials and Methods:

A 33-question online survey was conducted between April and May 2018. The survey was geared towards individuals with hereditary cancer syndromes that subscribed to newsletters and social media posts from an advocacy group, Facing Our Risk of Cancer Empowered (FORCE). The survey assessed respondent demographics and reproductive status. The questions investigated the knowledge and attitudes of respondents regarding fertility related issues, including diminished ovarian reserve, oocyte/embryo cryopreservation, and PGT-M. Statistical analysis was descriptive and also included binary logistic regression.

Results:

A total of 140 respondents completed the survey, 50% of whom were of reproductive age. The majority of respondents were college educated (89%), and the majority were married (73%), with 20% expressing a desire for future childbearing. BRCA 1 (36.2%) and BRCA 2 (46.9%) were the most prevalent cancer-predisposing mutations in those surveyed. Mean age at time of mutation testing was 41.3 ± 12.8 years. Of those that underwent risk reducing surgery (70%), 67% underwent bilateral salpingo-oophorectomy (BSO). A small proportion of respondents had already been diagnosed with breast (27%) and ovarian cancer (5%). Awareness regarding PGT-M was significantly increased in younger patients ($p=0.02$) who did not have a cancer diagnosis ($p=0.04$). Of the respondents that were familiar with PGT-M (43.6%), a minority (17%) stated that they would consider using PGT-M prior to conceiving a future pregnancy. Many respondents (69%) were not aware that PGT-M can only be formed on embryos, not unfertilized oocytes. Only 16% of respondents had previously consulted with a reproductive endocrinologist regarding their fertility and family planning. Despite this, 44% were aware of fertility preservation and would opt to freeze oocytes/embryos preoperatively if they were to undergo BSO. Respondents in the youngest age group (18-24 years) were least likely to opt for preoperative fertility preservation. Top concerns regarding undergo IVF-PGT included financial burden (69.8%) and psychological distress (48.7%).

Conclusion:

Individuals with cancer-predisposing mutations are faced with complex challenges that require health care professionals to discuss not only the medical implications of their carrier status and risk-reducing options, but to also share information regarding fertility preservation and the use of PGT-M to prevent transmission to their offspring. Our findings point to a need for earlier mutation screening in order to maximize the opportunity to utilize fertility preservation and PGT-M. There is an opportunity to increase patient awareness regarding reproductive options,



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particularly by OBGYNs and geneticists who could implement early referral to a reproductive endocrinologist for detailed counseling. Potential barriers to patients' accessing all available options may be alleviated by working to promote access to ART care (including IVF-PGT) and by ensuring a multidisciplinary approach involving psychological support and counseling.