ORIGINAL ARTICLE: FERTILITY PRESERVATION

To freeze or not to freeze: decision regret and satisfaction following elective oocyte cryopreservation

Eleni A. Greenwood, M.D., M.Sc.,[a] Lauri A. Pasch, Ph.D.,[a] Jordan Hastie, B.S.,[b] Marcelle I. Cedars, M.D.,[a] and Heather G. Huddleston, M.D.[a]

[a] Department of Obstetrics, Gynecology and Reproductive Sciences, University of California San Francisco, San Francisco; and [b] University of California San Francisco School of Medicine, San Francisco, California

Objective: To characterize the degree of decision regret following elective oocyte cryopreservation (EOC) for social indications, and identify factors associated with regret.
Design: Retrospective cohort survey study.
Setting: Academic center.
Patients: Two hundred one women who underwent EOC for fertility preservation between 2012 and 2016.
Interventions: None.
Main Outcome Measures: Decision Regret Scale (DRS) score, from 0–100, with a cut-off >25 indicative of moderate to severe regret; and attitudes regarding decision satisfaction.
Results: Median DRS score was 0 (interquartile range 0–15) and the mean was 10 (range 0–90). Thirty-three women (16%) experienced moderate to severe decision regret. Factors associated with decision regret included: number of eggs frozen, perceived adequacy of information prior to EOC, adequacy of emotional support during EOC, and patient-estimated probability of achieving a live birth using their banked eggs. In a multivariate logistic model, increased perceived adequacy of information (adjusted odds ratio 0.63, 95% confidence interval 0.42–0.97) and patient-estimated probability of achieving a live birth (adjusted odds ratio 0.80, 95% confidence interval 0.67–0.96) were associated with reduced odds of regret. One hundred sixty-seven women (88%) reported increased control over reproductive planning following EOC. One hundred eighty-three (89%) affirmed they will be happy they froze eggs, even if they never use them.
Conclusions: The risk of decision regret following EOC is non-negligible. Low number of mature oocytes cryopreserved is a risk factor for increased regret, while perceptions of adequate information and emotional support, and increased patient-estimates of achieving a live birth using banked eggs are associated with reduced risk of regret. (Fertil Steril® 2018;■:■–■. ©2018 by American Society for Reproductive Medicine.)
Key Words: Elective oocyte cryopreservation, social egg freezing, fertility preservation, decision regret

Discuss: You can discuss this article with its authors and other readers at https://www.fertstertdialog.com/users/16110-fertility-and-sterility/posts/30503-25513.

The American Society for Reproductive Medicine (ASRM) retracted the experimental designation from oocyte cryopreservation for medical indications in 2012 (1). Subsequently there has been a rapid increase in utilization of this technology (2). In 2015 in the U.S., 7,518 oocyte banking cycles were reported, twice that of 2012 (2). While some of these cycles represent fertility preservation for medical indications such as cancer, a major driver of the increased volume involves reproductively healthy women pursuing fertility preservation for social indications (3).

Use of elective oocyte cryopreservation (EOC) to circumvent age-related fertility decline is one marker of a greater societal trend to delay age of childbearing (4), often attributed to women's pursuit of educational, personal or professional goals (5–8). Proponents of EOC conceptualize the technology as bridging the gap between social opportunities outpacing biological realities (9).

Oocyte cryopreservation for non-medical reasons is a new application of egg-freezing technology, is completely elective, and there are limited data to help women anticipate the long-term reproductive outcomes of their decisions (10). Citing lack of efficacy data as well as concerns over unknown emotional risks, the current position of the ASRM is that, "…data … are insufficient to

Received December 23, 2017; revised February 6, 2018; accepted February 20, 2018.
E.A.G. have nothing to disclose. L.A.P. have nothing to disclose. J.H. have nothing to disclose. M.I.C. have nothing to disclose. H.G.H. have nothing to disclose.
Correspondence: Eleni A. Greenwood, M.D., M.Sc., Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Reproductive Endocrinology and Infertility, University of California San Francisco School of Medicine, 499 Illinois Street, San Francisco, CA 94158-2519 (E-mail: eleni.greenwood@ucsf.edu).

Fertility and Sterility® Vol. ■, No. ■, ■ 2018 0015-0282/$36.00

https://doi.org/10.1016/j.fertnstert.2018.02.127

recommend elective oocyte cryopreservation" (1). Given that this application is being widely employed despite this warning, it is critical to begin to study the quality of these important family planning decisions.

Decision regret has been defined as a negative emotion involving distress or remorse following a decision (11). It is considered an overall indicator of the quality of health decisions and is increasingly viewed as an important patient-reported outcome in interventional studies (12, 13).

Evidence regarding decision regret outcomes following EOC is sparse. A survey study of 183 women who underwent EOC in New York City from 2005 to 2011 found that 53% deemed the experience as empowering (9) but did not examine regret per se. Among 65 women who underwent EOC in Belgium from 2009 to 2011, none reported regretting egg banking; meanwhile, 3 of 29 women who sought consultation but did not pursue EOC reported regretting their decision (14). Ninety-five percent of oocyte bankers reported they would to do it again (14). Importantly, there are no published data assessing decision regret using a validated instrument. Furthermore, no decision outcomes data are available from women pursuing EOC in the modern paradigm in which oocyte cryopreservation technology is not considered experimental.

The objective of our study was to delineate the extent to which women electing oocyte cryopreservation for non-medical indications regret their decision, and to identify risk factors associated with decision regret. We additionally sought to characterize subjective attitudes of satisfaction following EOC to facilitate a balanced, comprehensive understanding of patient reflections on their EOC decision. We hypothesized that the following factors would be associated with decision regret: lower number of oocytes cryopreserved, reduced patient-estimated probability of achieving a live birth with their frozen eggs, reduced patient-estimated probability of returning to use their eggs to achieve pregnancy, lack of employer coverage of treatment expenses, lower perceived adequacy of information prior to undergoing EOC, lower perceived adequacy of emotional support during the EOC process, and ambivalent attitudes regarding the desire for parenthood.

MATERIALS AND METHODS

From 2012 to 2016, 503 women underwent EOC at a single academic institution. Women who froze eggs for medical indications (e.g. a new cancer diagnosis anticipating gonadotoxic therapy), for oocyte donation, and those intending in vitro fertilization but without available sperm on the day of egg retrieval were not included in the study cohort.

Following Institutional Review Board approval, a survey was distributed via email to the study cohort using a secure online REDCap platform (Vanderbilt University). Participants provided electronic signatures indicating consent to participate.

The primary outcome of our study, decision regret, was measured using the validated Decision Regret Scale (DRS) (11). The DRS was developed by a group of decision scientists and health practitioners. The validation process for the scale has been explicitly described (11), and involved testing in a series of four patient populations making distinct health care decisions. Correlations of DRS scores with multiple measures (satisfaction, decisional conflict, and health outcomes) were examined to determine convergent validity (11). The DRS has been used broadly in the literature to assess decision regret across a variety of health care settings (12).

Additional questions specific to the experience of oocyte cryopreservation were developed by a panel of experts, including reproductive endocrine and mental health specialists, following literature review and exploratory qualitative pilot interviews of prior EOC patients. Questionnaire development was an iterative process, with care taken to provide a balanced instrument mindful of completion time requirement. Questions focused on factors hypothesized to be associated with decision regret, and reflections of satisfaction developed ad hoc to achieve the study objectives. Survey items were tested thoroughly in a small sample of volunteer patients and topic experts before distribution.

The following domains were examined in 30 items: demographics (10 questions), perceived adequacy of information and emotional support (2 questions), reproductive planning (6 questions), desire for parenthood (3 questions), satisfaction (4 questions), and decision regret (5 questions). Likert-type scales were used. Percentage estimations were offered via multiple choice response in intervals of 10% (Supplemental Appendix).

Demographics

Basic demographics included relationship status, education, income, race and sexual orientation. Participants were asked whether, "Work covered at least some expenses to freeze my eggs" (Y/N), to determine employer benefit status (Supplemental Appendix). Data regarding oocyte yield, number of retrieval cycles, anti-müllerian hormone and antral follicle counts were derived from the electronic medical record.

Perceived Adequacy of Information and Emotional Support

Using Likert-type scales, perceived adequacy of information ("I had enough information when I decided to freeze eggs"), and perceived adequacy of emotional support ("I felt adequate emotional support during the process") were assessed.

Reproductive Planning

Likelihood of using frozen eggs. Participants were asked to estimate the likelihood they would return to use their eggs to achieve pregnancy, using multiple-choice options of 0–100% in 10% intervals.

Predicted chances of a live birth using frozen eggs. To evaluate women's perception of achieving a live birth using their frozen oocytes, participants were asked, "With the number of eggs you have frozen, what do you think are your chances of having a baby by IVF?" Participants were also asked to indicate the number of babies they expected using banked eggs. Expectations of live birth rates per oocyte were derived from these responses.