

OOCYTE CRYOPRESERVATION FOR FERTILITY PRESERVATION: THE EFFECT OF AGE ON THE QUANTITY AND MATURITY OF OOCYTES

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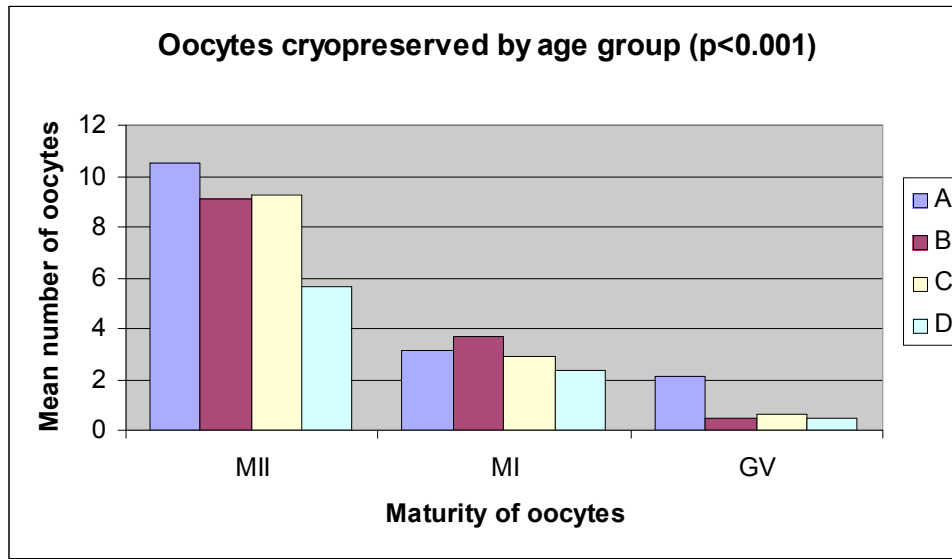
Objective: Recent advances in human oocyte cryopreservation have enabled this therapeutic modality to enter the clinical arena for long-term female fertility preservation. After completing an IRB approved clinical study of oocyte cryopreservation and thaw, with a 75% pregnancy rate, our center initiated another IRB approved clinical trial for long-term female fertility preservation. We report the initial experience with this program at our large academic reproductive center. The relationship between cycle cancellation, patient age and the oocytes available for cryopreservation were evaluated.

Materials and Methods: Data from women presenting for elective oocyte cryopreservation were reviewed between January 2005 and December 2006. Variables analyzed included cancellation rate, patient age, number of retrieved oocytes, number of cryopreserved oocytes, and oocyte maturity at cryopreservation. Characteristics of the variables across different age groups (A<35, B=35-37, C=38-40, D>40) were analyzed by statistical analysis.

Results: Following the completion of an informed IRB consent and all indicated screening and counseling procedures, ninety-one cycles of elective oocyte cryopreservation were initiated in 78 patients. Of these controlled ovarian hyperstimulation cycles initiated, 36 cycles were cancelled due to poor ovarian response (fewer than four mature follicles) and did not reach oocyte retrieval (39.6%). The mean patient age of the cycles cancelled was 39.0 ± 1.6 , with only one patient being cancelled more than one time. Of the 55 cycles (44 patients) that completed ovum retrieval, the ages ranged from 23 - 42 years, with a mean of 37.2 ± 3.9 . The mean number of oocytes retrieved was 13.1 ± 7.8 , and ranged from 2 – 47, while the number of oocytes cryopreserved was 12.9 ± 7.6 . Of the 55 cycles that reached retrieval, a quantity of ≥ 10 mature oocytes were retrieved and cryopreserved in 18 (32.7%). A detailed breakdown of the results is included for each of the patient age groups (A-D) in the table and on the figure below.

Age Group	A	B	C	D
Cycles Cryopreserved	8	16	25	6
Age – mean \pm SD	30 ± 5.1	36.4 ± 0.7	39 ± 0.8	41.3 ± 0.5
Cryopreserved oocytes per cycle – mean \pm SD	15.8 ± 8.2	13.3 ± 7.0	12.8 ± 8.4	8.5 ± 1.5
Mature MII oocytes - mean \pm SD	10.5 ± 8.0	9.1 ± 5.5	9.2 ± 7.7	5.7 ± 1.5
Immature MI oocytes - mean \pm	3.1 ± 2.2	3.7 ± 2.9	2.9 ± 3.6	2.3 ± 1.5

SD				
Immature GV oocytes - mean \pm SD	2.1 \pm 2.0	0.5 \pm 0.7	0.6 \pm 0.8	0.5 \pm 0.6
Cycles with \geq 10 MII oocytes	50%	44%	28%	0%



Conclusions: Our preliminary experience with offering elective oocyte cryopreservation for fertility preservation resulted in 91 cycles being initiated. Our high cycle cancellation rate of 39.6%, is probably due to the increased age of our patient population presenting for this elective procedure, and was demonstrated by the mean age of those patients who were cancelled (39.0 ± 1.6). Of the 44 patients who completed the 55 cycles analyzed in our study, the mean number of oocytes retrieved across all patients was 13.1, yet only 32.7% of cycles yielded the optimal ≥ 10 mature oocytes for cryopreservation. The results, when broken down by age group, demonstrate that there is a decline in total oocytes available for cryopreservation as age increases (Table). Additionally, the number of mature oocytes available for cryopreservation significantly declines when analyzing across the patient age groups ($p < 0.001$) (Figure). The number of cycles having ≥ 10 mature oocytes for cryopreservation, initially at 50% of cycles in the youngest age group, declines dramatically after the age of 37. Our analysis of the elective oocyte cryopreservation cycles suggests that the age of the patient significantly affects the cancellation rate as well as both the quantity and maturity of the oocytes available for cryopreservation. These findings suggest that patients are presenting after the age at which this elective procedure could most optimally serve. Education and counseling of the younger female population, for which this new technique is most advantageous, will have to be further developed for the greatest benefit to fertility preservation.