

POSITIVE ASSOCIATION BETWEEN THE mtDNA CONTENT OF OOCYTES FROM DONORS AND AGE

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Abstract Body

Objective: To quantify the mtDNA content in fresh oocytes to understand the mtDNA turnover from oocyte to blastocyst. An important question is to what extent, the final embryo mtDNA content could be conditioned by the initial mitochondrial mass in the oocyte. To date, no good quality data are available in fresh, non inseminated oocytes.

Design: A prospective cohort study with a total of 36 fresh unfertilized oocytes from 11 donors with ages between 18-34 years.

Materials and methods: Fresh unfertilized MII oocytes from donors were introduced in PCR tubes with 2,5 µl of PBS and then a Q-PCR was completed to assess the mtDNA copy number. Q-PCR was conducted with SurePlex DNA Amplification System (Illumina), using specific primers for the ATP8 gene, to assess the total mt DNA content. mtDNA content for each patient was calculated. Moreover, mtDNA was studied grouping oocytes by donor age (18-25; 26-30; 31-34) and comparing them intra groups. Data was analysed by logistic regression analysis and ANOVA test.

Results: In our study we encounter a significant positive relation between the age of the donor and the mtDNA content of the oocytes ($p < 0.05$). Additionally, when we compare the mtDNA intra groups of age, we encounter a high variability in the mtDNA content ($p < 0.05$).

Conclusions: Our results leave open questions about the influence of the mitochondrial baggage of the oocytes over the final mtDNA content of the embryo and how these variations will have an impact on embryo viability. An increased number of samples will be required to confirm the relationship between the mtDNA copy number and the oocyte age, but in our study this association appears to be clear. The positive relationship with age has been attributed to a compensatory way to guarantee enough ATP production or due to a respiratory chain dysfunction.

Abstract image

