# AN EVALUATION OF THE RELATIONSHIP BETWEEN FACIAL AGE AND OVARIAN RESERVE IN WOMEN UNDERGOING ART – THE "FACE MY AGE" STUDY

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## BACKGROUND

- Age is an imperfect marker of ovarian aging.
- Current ovarian reserve markers (AMH, antral follicle count, and oocyte yield) require invasive, costly procedures.
- Estimated facial age using artificial intelligence (AI) has been linked to heart disease, dementia, and lifespan. [1]

## OBJECTIVE

- We hypothesized that the difference between facial age and actual age (AgeDiff) may correlate with oocyte yield. We aimed to evaluate the potential synergistic effects of AgeDiff with known ovarian markers, AMH and age

## METHODS

- Prospective Cohort Study
- Women undergoing IVF at a university fertility clinic
- Exclusion criteria were facial plastic surgery, missing photo or AMH
- Photographs were taken in a standardized manner on the day of egg retrieval, de-identified, and analyzed with AI to determine facial age.
- AgeDiff was calculated from the upper limit of facial age minus actual age and categorized: ≤-3, -3 to +3, +3-6, +6-9, and >9 years
- AgeDiff, AMH, age and oocyte yield were examined using Spearman correlations
- AMH, age and oocyte yield were compared across AgeDiff categories using Kruskal Wallis tests
- Independent and joint associations with oocyte yield were evaluated using negative binomial regressions to estimate rate ratios (RR) and 95% confidence intervals (CI).
- Models were adjusted for age, AMH, BMI, race, ethnicity, smoking status, and ovulatory infertility.
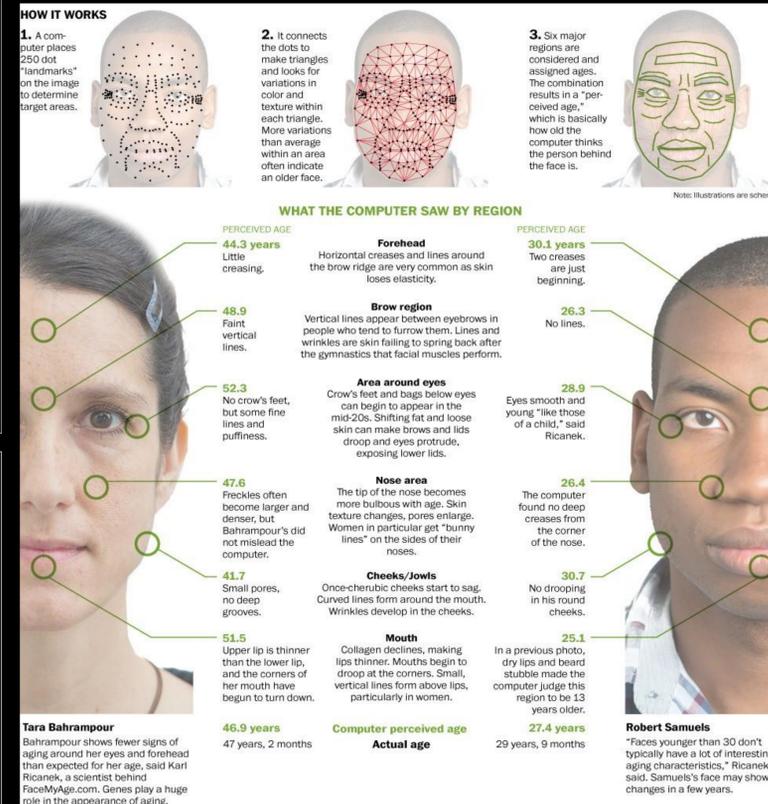


## RESULTS

- AgeDiff ranged from -7.1y to +17y [mean +5.2 ±4.6].
- Median oocyte yield was 17.5 (IQR 11-27).
- AgeDiff was negatively correlated with age (r = -0.27) and modestly positively correlated with AMH (r = 0.14) and oocyte yield (r = 0.14).
- Average patient age decreased with increasing AgeDiff categories (p=0.002).
- Women appearing ≥3y younger had lower median oocyte yield [12 (IQR 10-22.50), p=0.33] and AMH [2.34 (IQR 1.26-5.65)] compared to women appearing >9y older [20 (IQR 14-30); median AMH 3.17 (IQR 2.22-6.54), p=0.30], though these differences were not statistically significant.
- In unadjusted models, AgeDiff positively associated with oocyte yield (RR 1.02, 95% CI (1.00-1.04); p=0.04), but the effect disappeared after adjusting for AMH, age and other potential confounders, (RR 1.00, 95% CI 0.99-1.02; p=0.53).
- Positive associations for AMH (RR 1.10 (95% CI 1.07-1.12) and inverse associations with age (RR 0.97, 95% CI 0.95-0.98) were maintained after adjustment for AgeDiff and other covariates. Evaluation of interactions indicated the effect of AMH on oocyte yield was strongest in patients that appeared 6-9y older than age (p for interaction = 0.01), controlling for actual age.

## CONCLUSION

- AgeDiff does not act as an independent marker of ovarian reserve. Our findings suggest that facial age may be a modifier of known markers of ovarian reserve, warranting further investigation of AI tools with potential for identifying subgroups for personalized fertility care.

## AFFILIATIONS

## REFERENCES