VERY LOW ANTI-MULLERIAN HORMONE (AMH) IS ASSOCIATED WITH LOWER EUPLOIDY RATES FOR OLDER PATIENTS

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Background
Most prior studies indicate that patients with a low AMH do not have higher rates of aneuploidy, suggesting that low AMH is associated with decreased embryo quantity, but not quality, when adjusted for age. However, previous research has not focused on patients with very low AMH.

Objective
In our study, we examined whether patients with an AMH ≤0.5 ng/mL have a decreased rate of euploid embryos.

Material and Methods
We performed a retrospective cohort study including all patients who underwent embryo banking or in vitro fertilization at a large academic fertility center from 2017-2022. Patients were stratified by the Society for Assisted Reproductive Technology age groups. Those with an AMH of ≤0.5 ng/mL (LOW) were compared to patients with an AMH of ≥1 ng/mL (CTL). Patients under 18 years (y) or with missing AMH values were excluded. The primary outcome was the rate of euploid embryos (#euploid embryos/#embryos biopsied). Secondary outcomes were the cycle cancellation rate, blastocyst (blast) formation rate (#blasts vitrified/#2-pronuclei zygotes) and stimulation cycle characteristics. Statistics included Mann Whitney U, Chi-Square, and a multiple linear regression ($p<0.05$ significant).

Results
527 LOW patients with a cumulative of 1171 cycles were compared to 3617 CTLs with 5591 cycles. Ages ranged from 28-48y (median: 39y), with 26.5% of cycles from patients <35y, 22.3% from those aged 35-37y, 16.8% from patients aged 38-39y and 34.4% from those ≥40y. Older patients were more likely to be in the LOW group ($p<0.001$). LOW patients had a longer stimulation (11 days vs. 10 days, $p<0.001$), yielded fewer oocytes (5 vs. 16, $p<0.001$) and mature (MII) oocytes (4 vs. 13, $p<0.001$).

Blast formation rate was not significantly different for any age group. However, euploidy rate was lower for the LOW group for patients aged 38-39y (0 vs. 33.3%, $p<0.004$) and those aged ≥40y (0 vs. 33.3%, $p<0.001$). A linear regression model controlling for age, estradiol at trigger, length of stimulation, number of MIIs, number of blasts biopsied, and blast formation rate found that AMH level was not predictive of euploidy rate for patients aged 38-39 ($p=0.24$), however, for those aged ≥40y, the model confirmed a decreased euploidy rate for those in the LOW group ($p<0.004$). Cancellation rate was higher for LOW patients across all age groups (26.6% LOW vs. 2.8% CTL, $p<0.001$).

Conclusions
For patients with a very low AMH (≤0.5 ng/mL), we found that euploidy rate is not significantly different from normal AMH controls for patients aged ≤39y, but is decreased for patients aged ≥40y. These findings are important for patient counseling and suggest that embryo quality, in addition to quantity, may be compromised for older patients with a very low AMH compared to their normal AMH peers.

Support
None

References
None