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Title:

DECREASED OVARIAN RESERVE BIOMARKERS ARE ASSOCIATED WITH REDUCED FECUNDABILITY IN WOMEN WITH NO HISTORY OF INFERTILITY

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Objective:

Biomarkers for ovarian reserve such as anti-Müllerian hormone (AMH), basal antral follicle count (BAFC), and day 3 follicle-stimulating hormone (FSH) represent a woman's remaining follicular pool and are prognostic for infertility treatment. However, there has been some recent controversy about how well these biomarkers predict reproductive potential in women of unknown fertility status. Here we examine the relationship between ovarian reserve biomarkers and reproductive potential in women without male partners seeking intrauterine insemination with donor sperm (DIUI) as a proxy to the general population.

Design:

Retrospective cohort study of lesbian and single women undergoing DIUI at 12 US fertility centers from 2001 to 2017.

Materials and Methods:

The study included 4,728 unstimulated DIUI cycles from 2,270 patients aged 30-45 years. Cox proportional hazards models were used to evaluate the cumulative probability of ongoing pregnancy (OP), adjusting for patient age and individually evaluating each biomarker as a categorical variable.

Results:

We found that, after controlling for patient age, biomarkers for decreased ovarian reserve were associated with lower probabilities of OP (Table 1). We quantified the relative fecundability using the hazard ratio (HR) and found that patients with AMH ≤1 ng/mL had a significantly lower probability of OP compared to those with AMH 1-6 ng/mL, HR 0.67 (0.47-0.96). We also found significantly lower probability of OP in patients with low BAFC (HR 0.67 (0.50-0.88)) and in those with high FSH (HR 0.74 (0.57-0.97)). Patients with high AMH and BAFC did not differ significantly from those with normal ranges.

Conclusions:

Biomarkers suggestive of decreased ovarian reserve are associated with reduced fecundability in women seeking DIUI. These women are representative of women in the general population, indicating that these biomarkers can provide insight into fecundability, independent of age. Ovarian reserve biomarkers are not only informative for infertile patients, but can also provide valuable information for women who proactively seek to understand their reproductive potential.

Support:

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Table 1:

Table 1. Association of biomarkers for ovarian reserve and probabilities of ongoing pregnancy

Biomarker	N	Hazard ratio (95% CI)	p-value	Cumulative probability of ongoing pregnancy by 6 cycles using mean age 36.7, % (95% CI)
AMH, ng/mL				
≤1	261	0.67 (0.47-0.96)	0.03	31.6 (21.4-40.5)
1-6	743	1 [Reference]	-	43.3 (35.7-49.9)
>6	111	1.15 (0.80-1.66)	NS	47.9 (32.9-59.6)
BAFC				
≤8	440	0.67 (0.50-0.88)	0.004	38.1 (28.6-46.3)
9-25	1067	1 [Reference]	-	51.3 (43.3-58.3)
>25	150	0.98 (0.71-1.40)	NS	50.7 (36.7-61.7)
FSH, mIU/mL				
≤9	1496	1 [Reference]	-	48.5 (41.1-54.9)
>9	373	0.74 (0.57-0.97)	0.03	39.0 (29.6-47.1)