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ANTI-MÜLLERIAN HORMONE (AMH) IN PATIENTS WITH ONE OVARY UNDERGOING CONTROLLED OVARIAN HYPERSTIMULATION (COH)

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OBJECTIVE:

Patients with one ovary make up a small subgroup of patients undergoing controlled ovarian hyperstimulation (COH) for assisted reproductive technology. Studies attempting to quantify COH outcome in patients with a single ovary have demonstrated decreased, but not halved, oocyte yield compared to two ovary counterparts (1). Anti-Müllerian hormone (AMH) is a well-established ovarian reserve marker that is used to guide gonadotropin dosing prior to COH. To date, conflicting results have been established among research on AMH levels in patients with one ovary (1,2). Whether the current interpretation of AMH, based on patients with two ovaries, can be applied to patients with one ovary remains unknown. This study evaluates AMH levels and oocyte yield in patients with one ovary undergoing COH compared to those with two ovaries.

MATERIALS AND METHODS:

This multicenter retrospective study includes all patients with one ovary undergoing their first cycle of COH from 2016 to 2023. Patients were 1:3 propensity score matched to two ovary controls by age, body mass index, and year of treatment. The primary outcome was AMH at cycle start. Secondary outcomes included total and mature oocytes retrieved, total gonadotropins used during COH, and basal follicle stimulating hormone (FSH). Subgroup analysis by etiology of one ovary was performed. Chi square, Wilcoxon rank sum, and Kruskal Wallis tests were used to compare characteristics within the one ovary group, with $p<0.05$ considered significant. To compare cohorts, we used Spearman correlation and Wald tests of regression parameters from regression models of each characteristic as the outcome, and ovary

number as a predictor, fitted with generalized estimating equations (GEE) and adjusted for matching parameters.

RESULTS:

406 patients with one ovary and 1218 patients with two ovaries were included. AMH was lower in the one ovary group compared to two ovary group (1.2 vs 2.3 ng/mL, $p<0.01$). There was significant variation in AMH ($p<0.01$) by etiology of one ovary: ovarian torsion (n=55, AMH 2.0), benign cyst (n=146, AMH 1.5), malignancy (n=40, AMH 1.2), endometriosis (n=90, AMH 0.8), other adnexal pathology (n=22, AMH 0.6), not specified (n=53, AMH 1.0). Patients with one ovary had fewer total oocytes (8 vs 13, $p<0.01$) and mature oocytes (5 vs 9, $p<0.01$) compared to controls at retrieval. MH was similarly correlated to oocyte yield in the one ovary ($r=0.73$) and two ovary ($r=0.69$) groups. Patients with one ovary required more gonadotropins during stimulation than patients with two ovaries (4225 vs 3675 IUs, $p<0.01$). Basal FSH was significantly higher in the one ovary group compared to the two-ovary group (7.5 vs 5.6 mIU/mL, $p<0.01$).

CONCLUSIONS:

Patients with one ovary have significantly lower AMH compared to patients with two ovaries, and have fewer oocytes retrieved. However, the correlation between AMH and oocyte yield remained similar across cohorts.

IMPACT STATEMENT:

AMH levels are routinely lower in patients with one ovary, albeit utility in predicting oocyte yield and age-related ovarian reserve remains comparable to that of patients with two ovaries.

REFERENCES:

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