

**The predictive value of the number and size of small antral follicles following assisted reproduction treatment**

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**Objective:** Sono-automatic volume calculation (SonoAVC) automatically identifies and measures the dimensions of hypoechoic areas within 3D datasets. The technique lends itself to the assessment of follicles within the ovary. The objective of this study was to evaluate the predictive value of automated antral follicle counts stratified according to their relative sizes in women undergoing assisted reproduction treatment (ART).

**Methods:** 156 subjects with primary subfertility, age  $\leq 40$  years, BMI  $< 30\text{kg/m}^2$ , and baseline FSH  $\leq 15$  IU due to undergo their first cycle of ART were prospectively recruited. SonoAVC was used to quantify the total number of antral follicles measuring  $\leq 9\text{mm}$  in diameter. These follicles were then grouped into subsets according to their relative sizes:  $\leq 2.0$  mm, 2.1-4.0 mm, 4.1-6.0 mm, 6.1-8.0 mm, and 8.1-9.0 mm. The primary outcome was viable pregnancy confirmed on ultrasound 5 weeks following embryo transfer. The number of mature oocytes, fertilised oocytes and cleaved embryos were considered as secondary outcomes.

**Results:** After exclusion and lost data, data on 142 subjects were available for analysis. Those subjects who conceived had significantly more antral follicles measuring  $\leq 2.0$  mm ( $p=0.041$ ) and 2.1-4.0 mm ( $p<0.001$ ) than those who had unsuccessful treatment. There were no significant differences between the groups in the number of antral follicles measuring 4.1-6.0 mm ( $p=0.191$ ), 6.1-8.0 mm ( $p=0.203$ ) or 8.1-9.0 mm ( $p=0.601$ ). Multiple logistic regression suggested the number of antral follicles measuring 2.1-4.0 mm was an independent predictor of pregnancy (Exp(B)=1.234, 95%CI 1.092 and 1.491;  $p=0.004$ ; AUC=0.693). The number of these small antral follicles was also a significant predictor for all secondary outcome measures both in univariate and multivariate analysis.

**Conclusion:** The number of antral follicles measuring 2.1 to 4.0 mm in diameter appears to be an independent predictor of pregnancy and ovarian response following IVF treatment.