



OVO

CLINIQUE

THREE-DIMENSIONAL ULTRASONOGRAPHIC EVALUATION OF THE OVARIAN RESERVE

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INTRODUCTION

The Ovarian reserve (OVR) is considered to be a determinant factor in women's fertility.

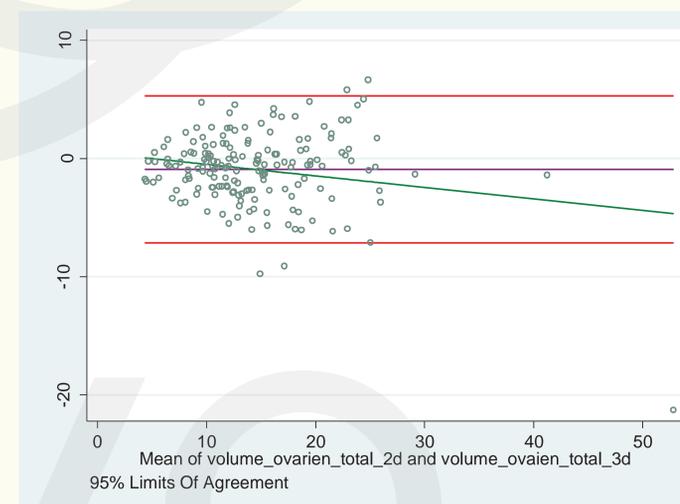
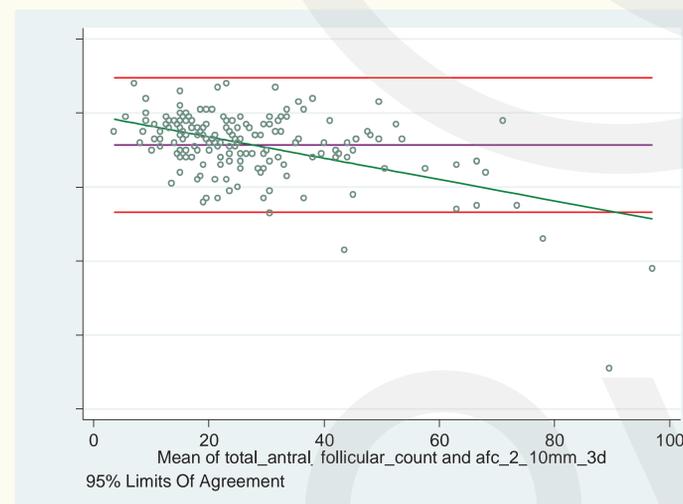
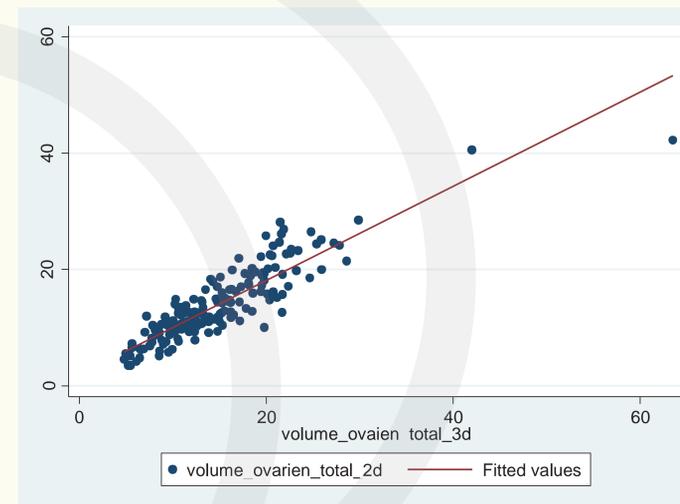
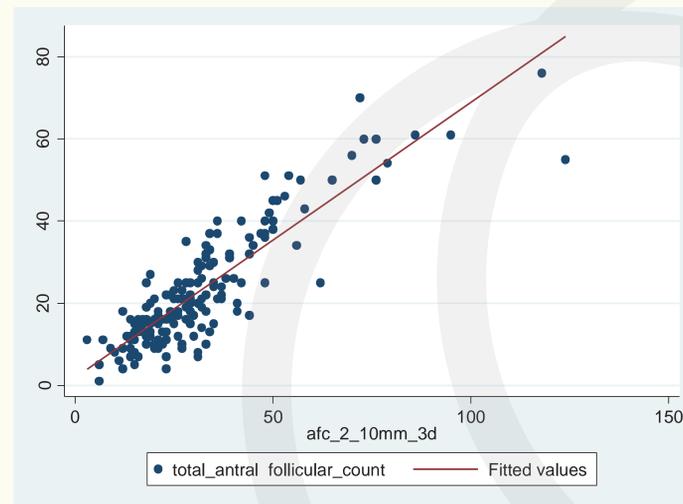
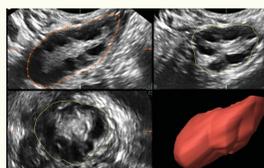
For long two-dimensional (2D) real time transvaginal ultrasound antral follicular count has been considered one of the most important tools for the evaluation of the OVR. This technique, however, is subject to inter and intra observer variation.

The aim of this study is to compare the reliability of the AFC and ovarian volume (OV) using 2D and 3D measurements.

MATERIALS AND METHODS

174 patients attending the **clinique ovo** between February 2009 to November 2011, were prospectively recruited. Subjects were evaluated during early follicular phase. AFC and OV were assessed with 2D ultrasound. 3D data sets stored at the time of the scan were analyzed with 4D-ViewTM (version 10.5, GE Medical Systems). Virtual organ computer-aided analysis (VOCAL®; GE Kretz, Zipf, Austria) was utilized to calculate the OV and SonoAVC® (Sono-Automatic Volume Calculation or Count; GE Medical Systems, Zipf, Austria) for the AFC calculation.

Paired Student's t-test was used to examine for differences in the mean AFC of the different methods. Pearson correlation coefficient, limits of agreement (LOA) and Bland-Altman plots were used to estimate the agreement between 2D and 3D ultrasound techniques. $P < 0.05$ was considered statistically significant.



RESULTS

2D ultrasound failed to identify antral follicles, this is reflected by a significant lower mean AFC compared to 3D ultrasound (23.27 (SD 14.40) vs. 31.91 (SD 18.91) and a mean difference of -8.64 (SD 9.28) ($p < 0.001$). Although, the correlation coefficient (CC) between the two methods was very good 0.88 ($p < 0.001$), the wide LOA (-26.83 and 9.55) and the Bland-Altman plot suggest a poor correspondence.

On the contrary, the OV estimation using VOCAL post processing vs. real time 2D ultrasound demonstrated an excellent agreement. The mean OV were (14.03 (SD 6.27) vs. 14.95 (SD 6.88) respectively, although there was a small mean difference of 0.92 (SD 3.17), it was statistically significant. The CC between the two techniques was very good 0.89 ($p < 0.001$). Moreover, the LOA (-7.14 and 5.30) and the Bland-Altman plot suggest a strong interdependence of the aforementioned techniques.

CONCLUSION

Our results demonstrate that SonoAVC® AFC could improve the assessment of the OVR by detecting more follicles missed by conventional 2D ultrasound. In the near future, this technique may help in the decision making of ART protocols.

We also observed that OV analysis by VOCAL® is as reliable as the 2D ultrasound. To our knowledge this one of the largest cohorts evaluating the accuracy of the 2D and 3D techniques, further research is needed to validate these findings and compare them with other OVR markers like anti-mullerian hormone.



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