



OVO

CLINIQUE

THREE-DIMENSIONAL EVALUATION OF THE OVARIAN RESERVE: THERE IS MORE THAN MEETS THE EYE

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INTRODUCTION

Ovarian follicular pool also known as ovarian reserve (OVR) is considered to be a determinant factor in women's fertility. The antral follicular count (AFC) has been shown to be a significant test to assess the OVR. During AFC calculation, every antral follicle ranging from 2 to 10 mm is identified by using two-dimensional (2D) real time transvaginal ultrasound.

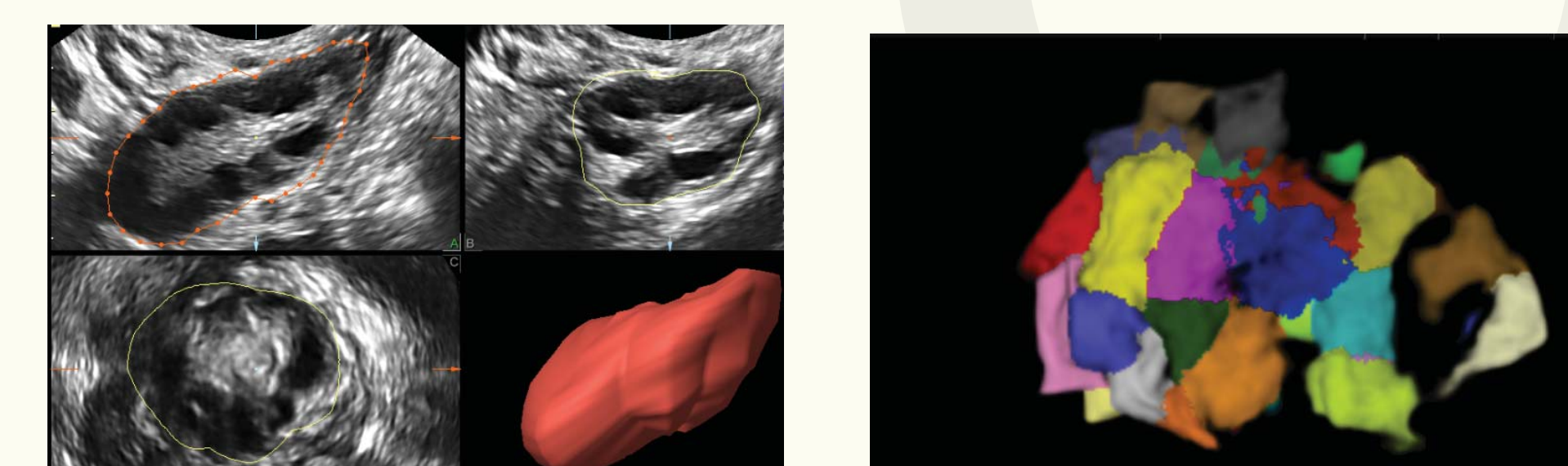
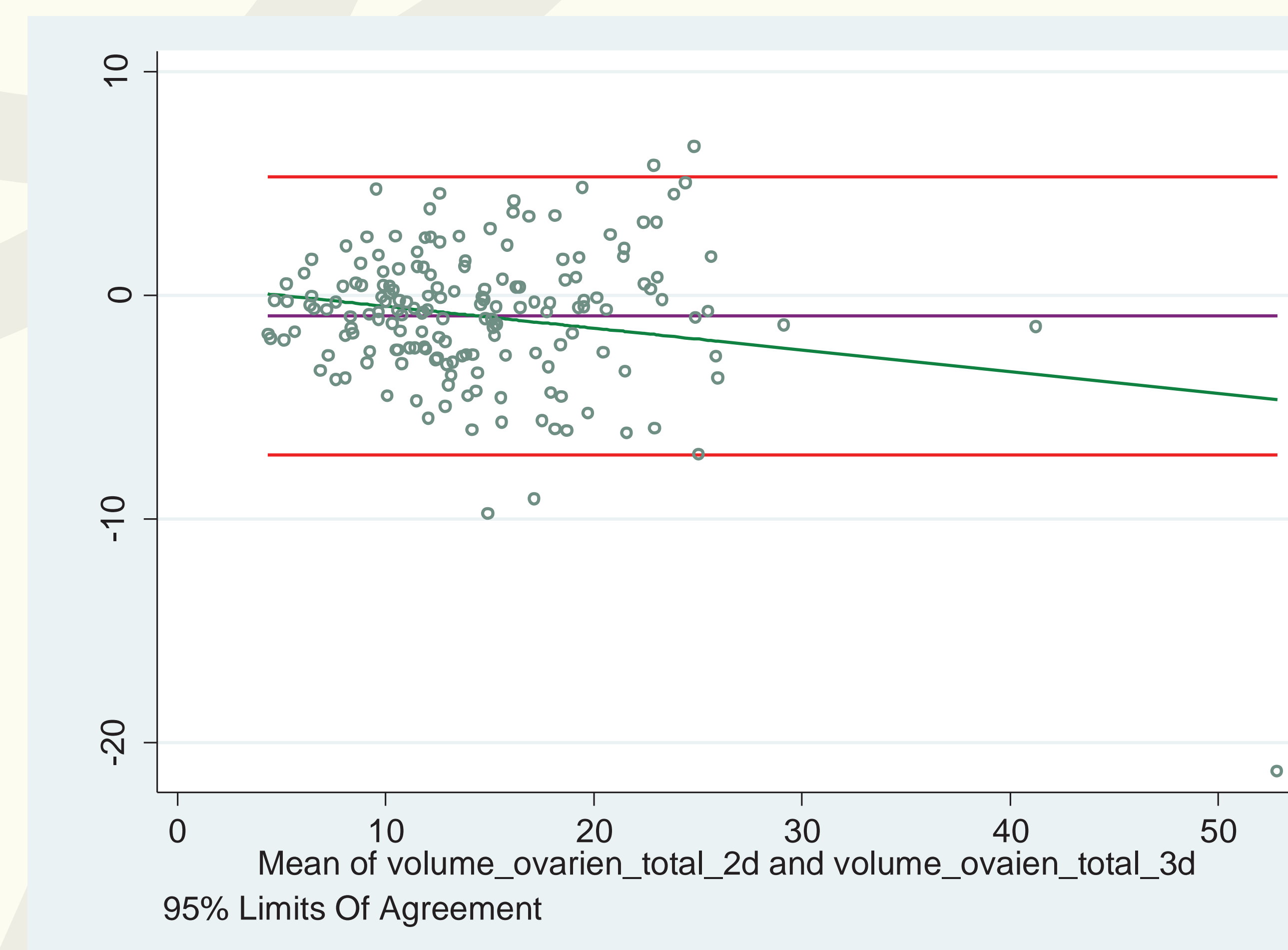
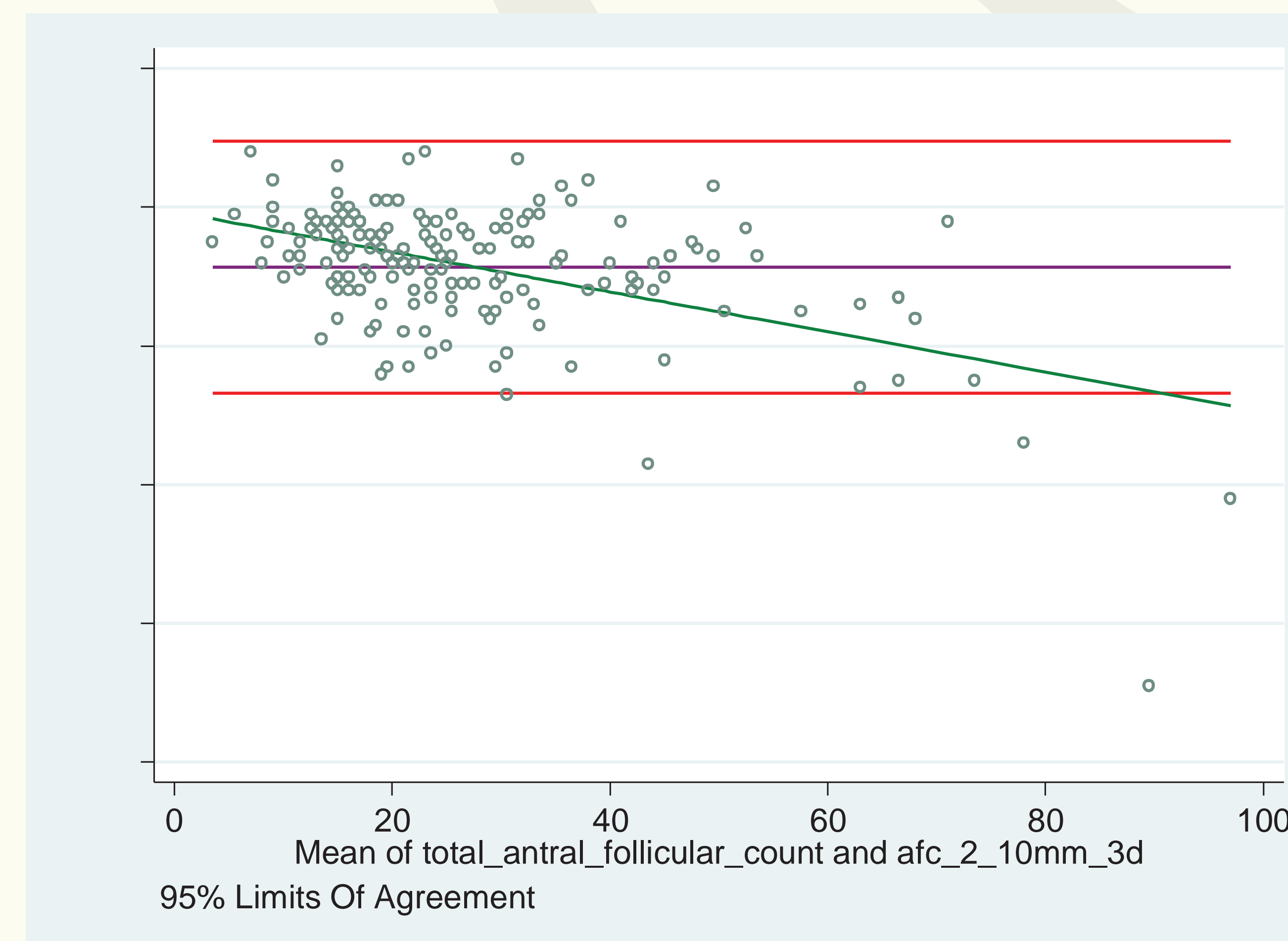
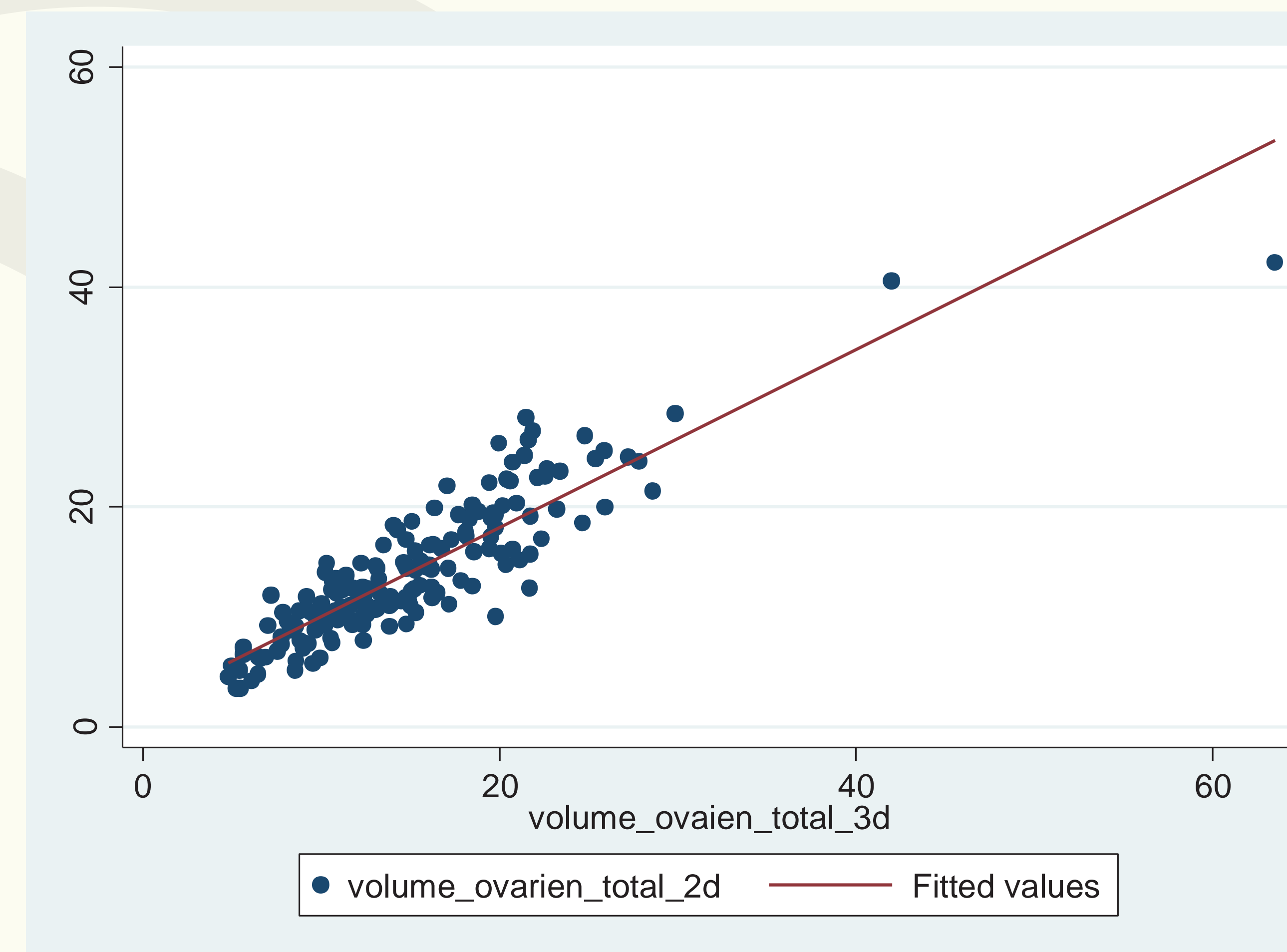
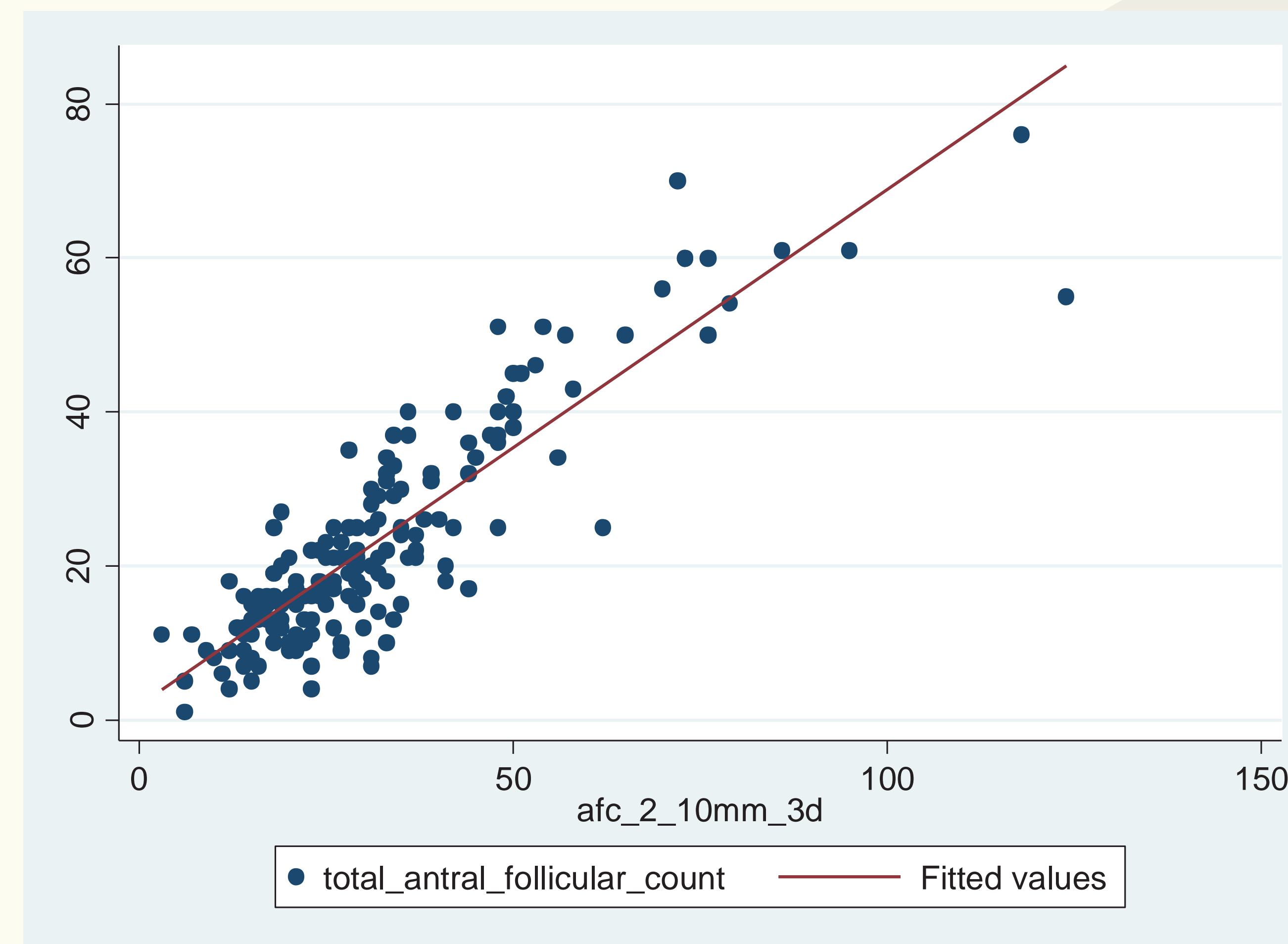
This technique is subject to inter and intra observer variation. Recent reports have shown a greater accuracy utilizing automated three-dimensional (3D) acquisitions.

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.

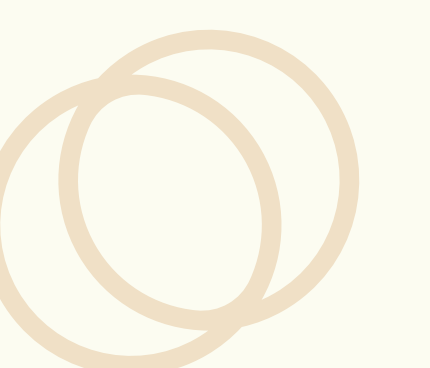
On the contrary, the OV estimation using VOCAL post processing vs. real time 2D ultrasound demonstrated an excellent agreement. The mean OV were (14.03 (SD 6.27) vs. 14.95 (SD 6.88) respectively, although there was a small mean difference of 0.92 (SD 3.17), it was statistically significant. The CC between 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.

further research is needed to validate these findings and compare them with other OVR markers like AMH.



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