IS SONO AVC THE WONDER TRICK IN FOLLICLE MONITORING?

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INTRODUCTION

Sono AVC (automated volume calculation) is a new software in the ultrasound designed to make automated measurements in 3 dimensions to provide a more accurate follicular diameter based on mean of the 3 values and also volume based diameter.

AIMS & OBJECTIVES

To compare the predictive value of manual follicle monitoring v/s the use of Sono AVC in routine follicle monitoring in IVF practice.

METHODOLOGY

- Type – A prospective clinical study
- Place - A tertiary care hospital ART centre.
- 46 patients were recruited for IVF cycle at the ART centre.
- Follicle count and diameter were noted manually and by Sono AVC (GE VOLUSON S6) on the day of oocyte retrieval by a single trained observer.
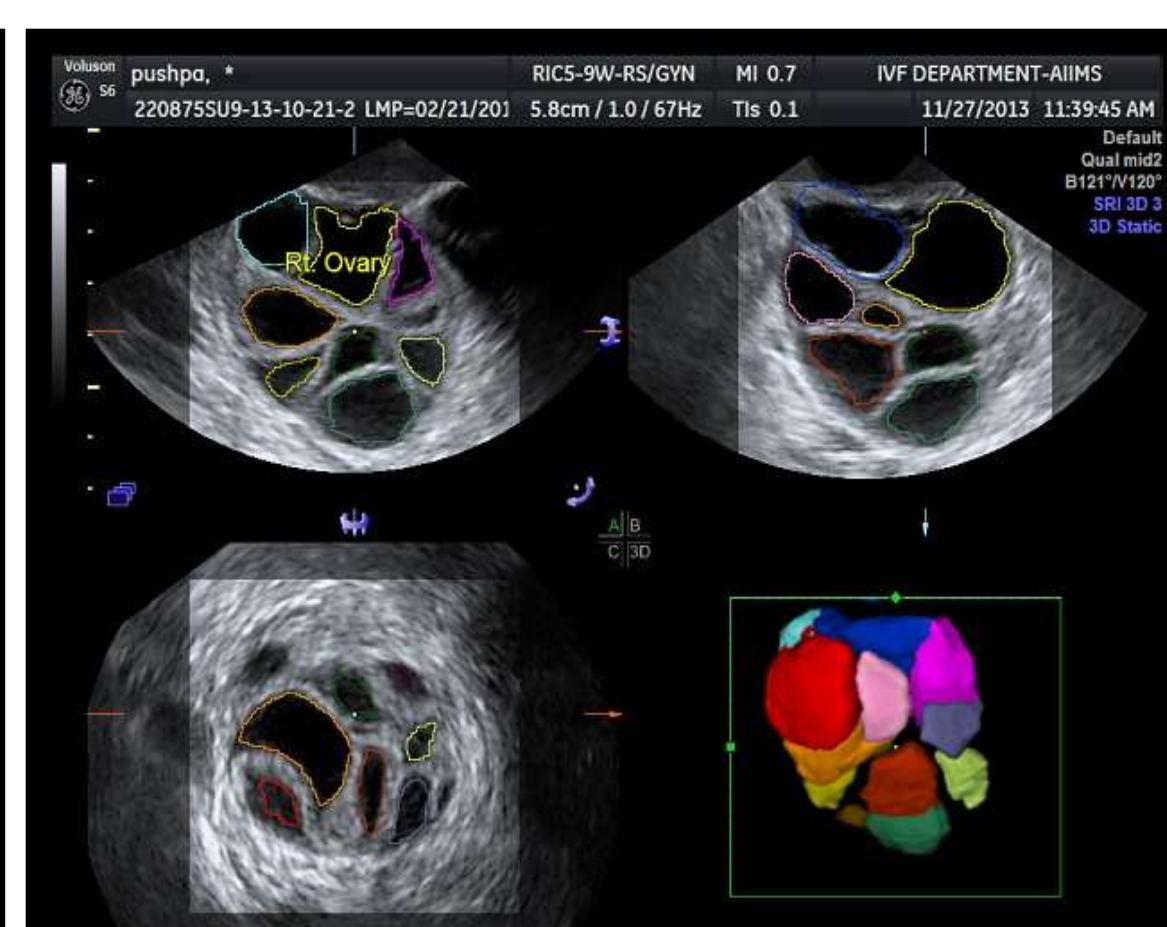- Oocyte count was correlated with manual and Sono AVC counts.

RESULTS

MANUAL(2-D) V/S 3-D SONO AVC

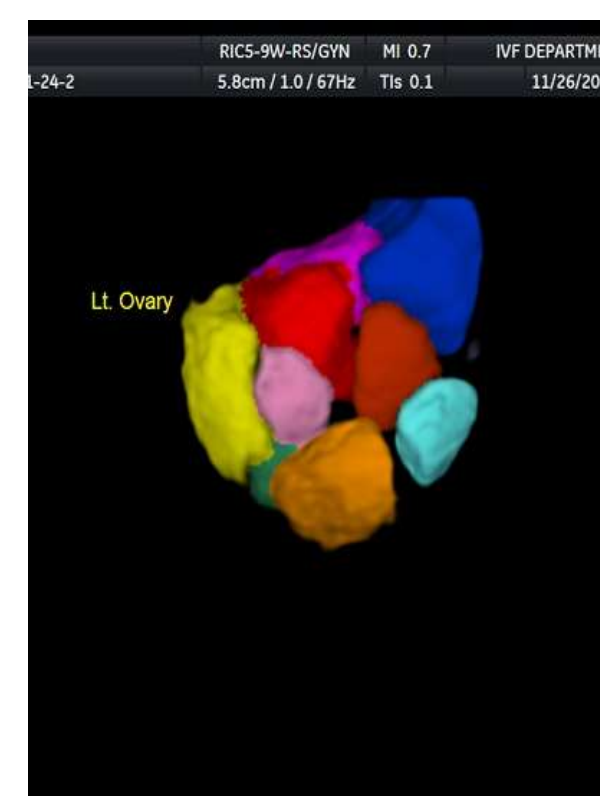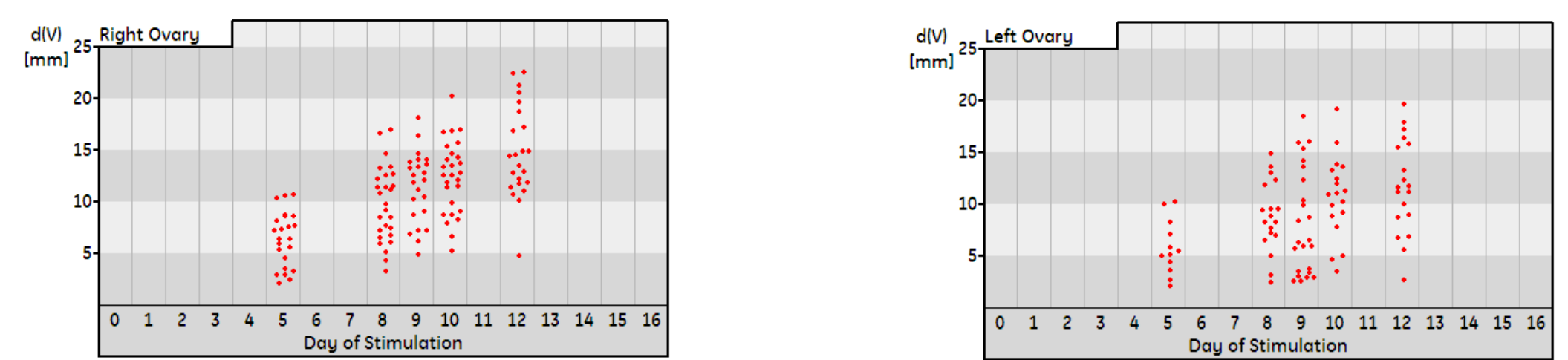|	Mean of differences	95% C.I.	Kendal's tau b coefficient	Error range	Intra class correlation
Total count of follicles	-1.43	-2.23 to -0.64	-0.39	3.35	0.902
Leading follicle (manual v/s 3-D mn.d)	-1.62	-2.44 to -0.79	-0.202	3.79	0.612
Leading follicle (manual v/s 3-D V(d))	0.08	-0.51 to 0.69	-0.024	2.80	0.750

	PEARSON CORRELATION (r)	P-VALUE
Manual count and oocyte retrieval	0.718	<0.001
3-D sono AVC count and oocyte retrieval	0.734	<0.001

- 3-D Sono AVC gives more total count of follicles.
- 3-D Sono AVC measurements of leading follicle are both in agreement with manual measurement but more so with volume based diameter (V(d)).
- Both manual and 3-D total counts of follicles are in correlation with oocyte retrieval.
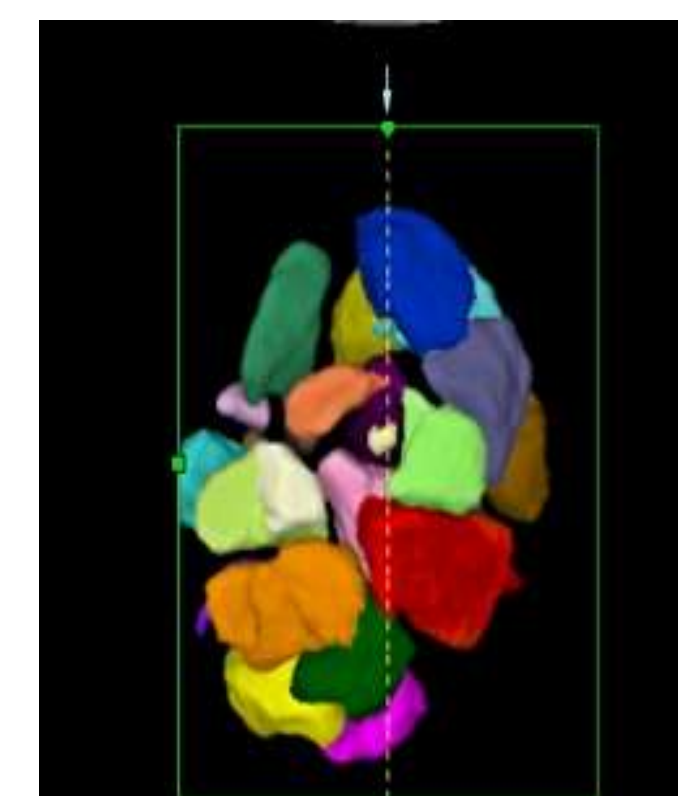- Mean duration of time with manual and SONO AVC are 209.2s and 156.6s (p-0.01)

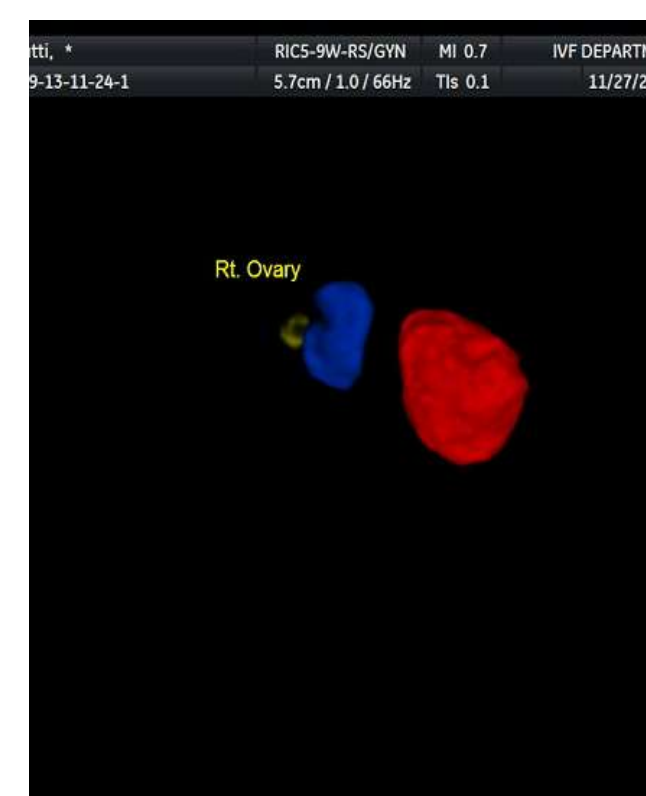| Nr.	d(V)	dx	dy	dz	mn. d	V
	mm	mm	mm	mm	mm	cm³
1	22.7	34.4	21.8	18.8	25.0	6.09
2	21.2	28.7	26.0	13.5	22.8	4.98
3	19.0	26.4	21.6	14.7	20.9	3.59
4	17.3	28.6	22.0	8.8	19.8	2.72
5	16.8	26.4	20.0	11.1	19.2	2.47
6	11.3	29.5	10.0	6.6	15.3	0.76
7	8.6	10.4	8.5	7.6	8.8	0.34
8	7.8	12.1	7.4	5.6	8.4	0.25
9	7.5	10.4	7.5	6.4	8.1	0.22

FOLLICLE TRACKING CHART
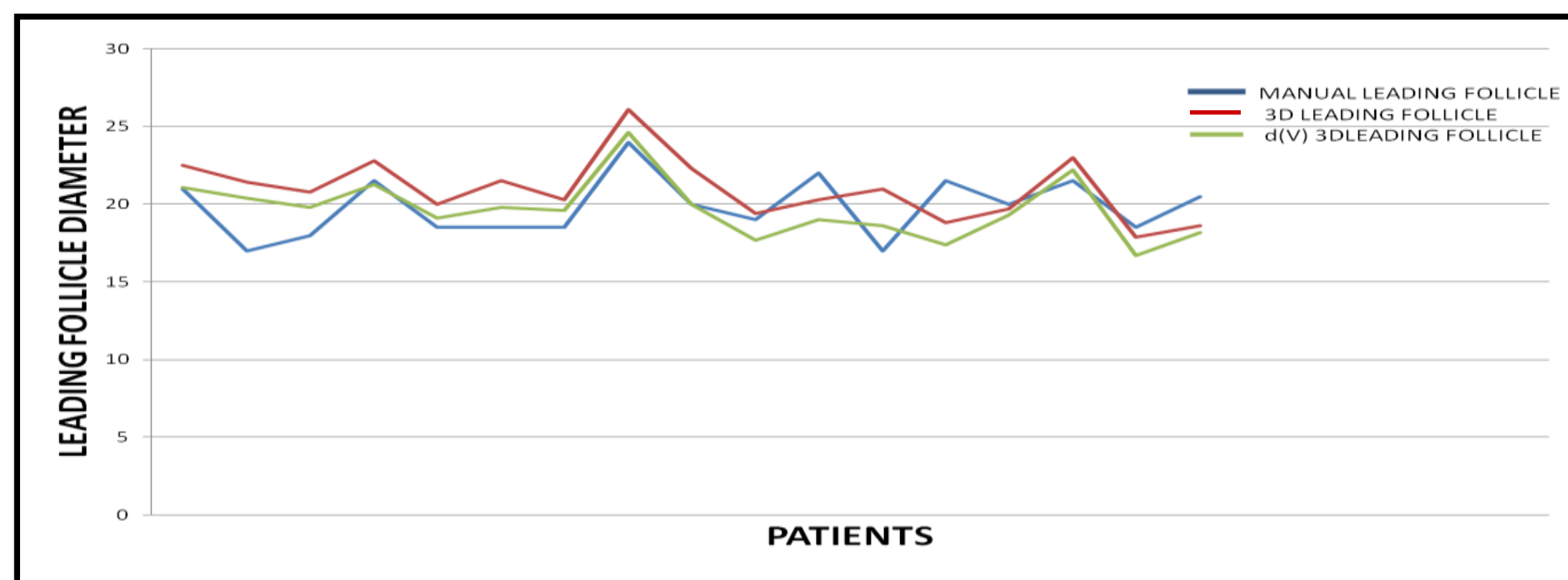

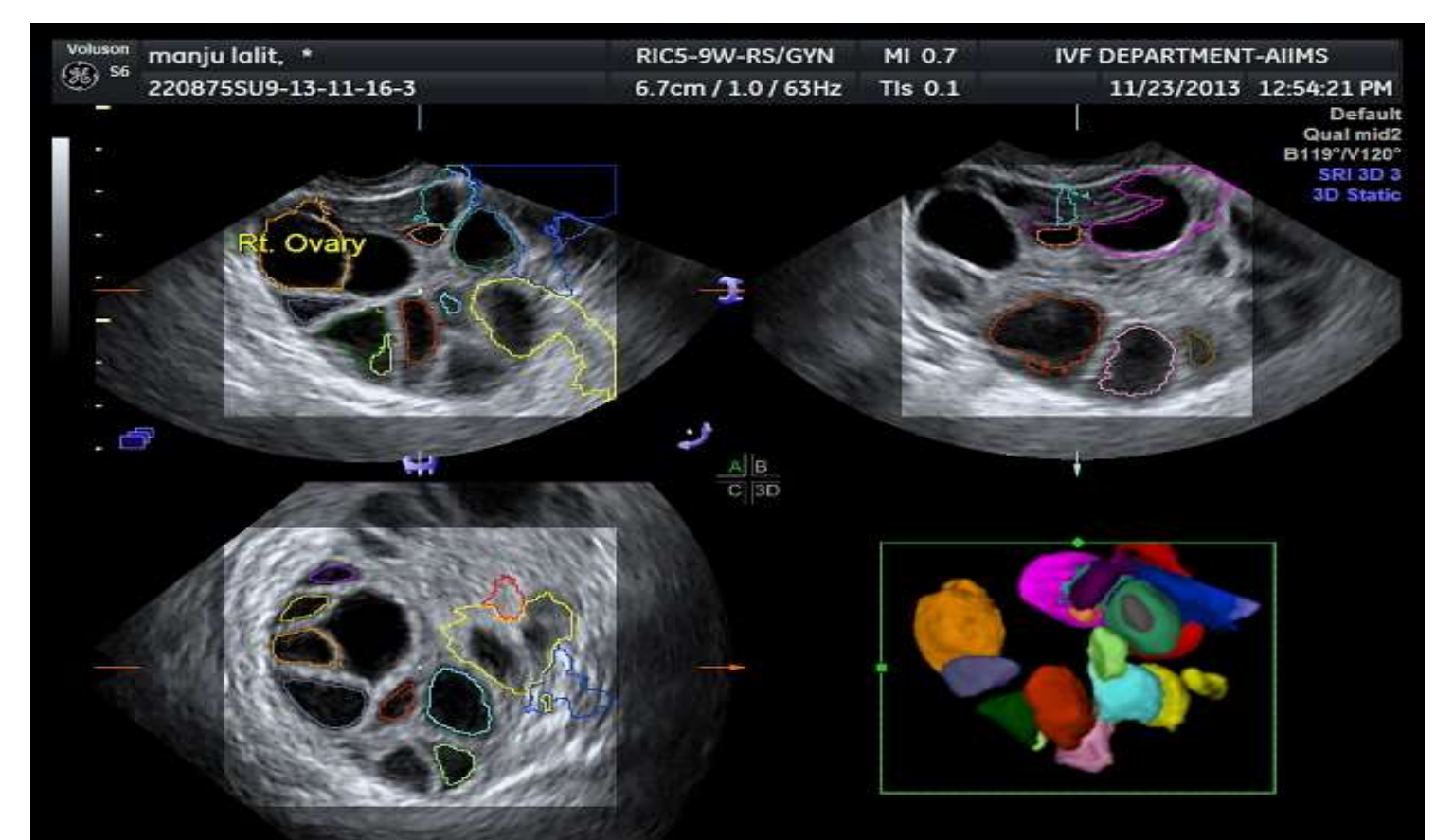NORMAL RESPONSE   HYPER RESPONSE   POOR RESPONSE

LEADING FOLLICLE DIAMETER

DISCUSSION

- Nick Raine-Fenning et al. (N=51), Sono AVC provided highly accurate follicular diameter dimensions (LOA 0.83 to -2.17). Time required for manual count is twice that required for Sono AVC (p<0.05).[1]
- Sonal Panchal et al. (N= 75) Correlation of AFC and follicles >12 mm on day of hCG in PCO group is 0.56 and non-PCO group is 0.63, and for AMH and follicles >12 mm on day of hCG in PCO group is 0.42 and non-PCO group is 0.47. Correlation of AFC with number of ova retrieved on OPU in PCO group is 0.44 and for non-PCO group is 0.50. [2]

PITFALLS REQUIRING POST PROCESSING (cut, add/remove,separation,growth)

CONCLUSION

- Using 3-D Sono AVC is a useful adjunct in routine follicle monitoring, with significant reduction in time and correlates well with manual counts.
- It is a very good tool to counsel patients regarding ovarian response as it is pictorial and also serves to maintain graphical record of each cycle. Further research with larger sample size is required to further validate our study.

REFERENCES

1. Nick Raine-Fenning, Kannamanadiar Jayaprakashan et al. Automated measurements of follicle diameter:a chance to standardize? Fertility and Sterility vol. 91, Issue 4 supplement, April 2009, Pages 1469–1472.
2. Sonal Panchal, Chaitanya Nagori. Comparison of anti-mullerian hormone and antral follicle count for assessment of ovarian reserve. J Hum Reprod Sci. 2012 Sep-Dec; 5(3): 274–278.