

Introduction

Endometrium is critical for successful implantation through interaction with embryo. Endometrial blood flow reflects uterine receptivity because endometrium is site of embryonic implantation. TVS can be thought of an ideal non invasive technique. Parameters used for assessing endometrial receptivity include endometrial thickness, endometrial pattern and endometrial vascularity in order to identify patients with low implantation potential. 3D Power doppler can be used to assess endometrium through any desired plane of uterus. 3D Power doppler can analyse vascular tree and allows quantification of power doppler signals by using three indices- Vascularization index (VI), Flow index (FI), Vascularization flow index (VFI).

Results

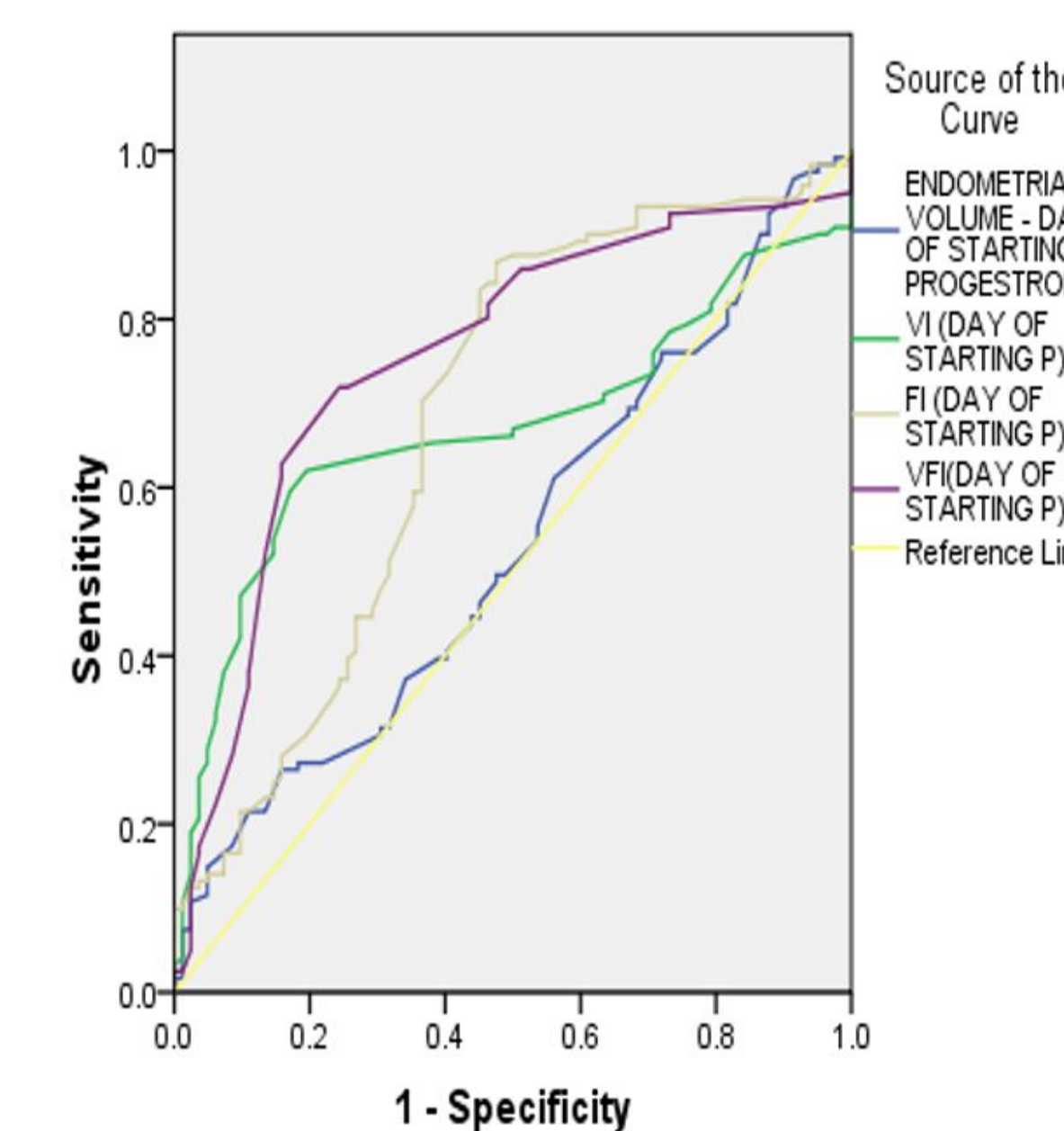
- Prospective cohort study done on 203 women undergoing FET cycles in a tertiary care centre for a period of two years (November 2018 to November 2020) to see correlation of endometrial and subendometrial blood flow assessed by 3D power Doppler.
- Various indices endometrial volume, endometrial and subendometrial vascularisation index (VI), flow index (FI) and vascularisation flow index (VFI) obtained and compared between pregnant and non-pregnant group.
- Primary outcome : clinical pregnancy rates.
- Secondary outcome : ongoing pregnancy rates.
- Out of 203 patients, 121 patients achieved pregnancy with pregnancy rate of 59.6%.
- The endometrial thickness and volume comparable between two groups.
- Endometrial and subendometrial VI, FI and VFI significantly higher in pregnant as compared to non-pregnant group.
- ROC curves plotted for these parameters and cut off values calculated.
- Cut off value of endometrial VFI of 1.18 and subendometrial VFI of 2.35, gave ongoing pregnancy rates of 67.3% and 59.5%, respectively.

		Cut off	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Diagnostic accuracy
1	Endometrial Thickness (mm)	9.35	53.00%	45.00%	59.09%	39.78%	50.25%
2	Endometrial volume (ml)	2.77	49.59%	52.00%	60.61%	41.35%	50.74%
3	Endometrial VI (%)	2.85	65.29%	62.20%	71.82%	54.84%	64.04%
4	Endometrial FI (0-100)	23.41	70.20%	63.40%	73.91%	59.09%	67.49%
5	Endometrial VFI (0-100)	1.18	71.90%	75.60%	81.31%	64.58%	73.40%
6	Sub endometrial VI (%)	4.53	61.98%	62.20%	70.75%	52.58%	62.07%
7	Sub endometrial FI (0-100)	24.59	57.90%	48.80%	62.50%	43.96%	54.19%
8	Sub endometrial VFI (0-100)	2.35	66.90%	63.40%	72.97%	56.52%	65.52%

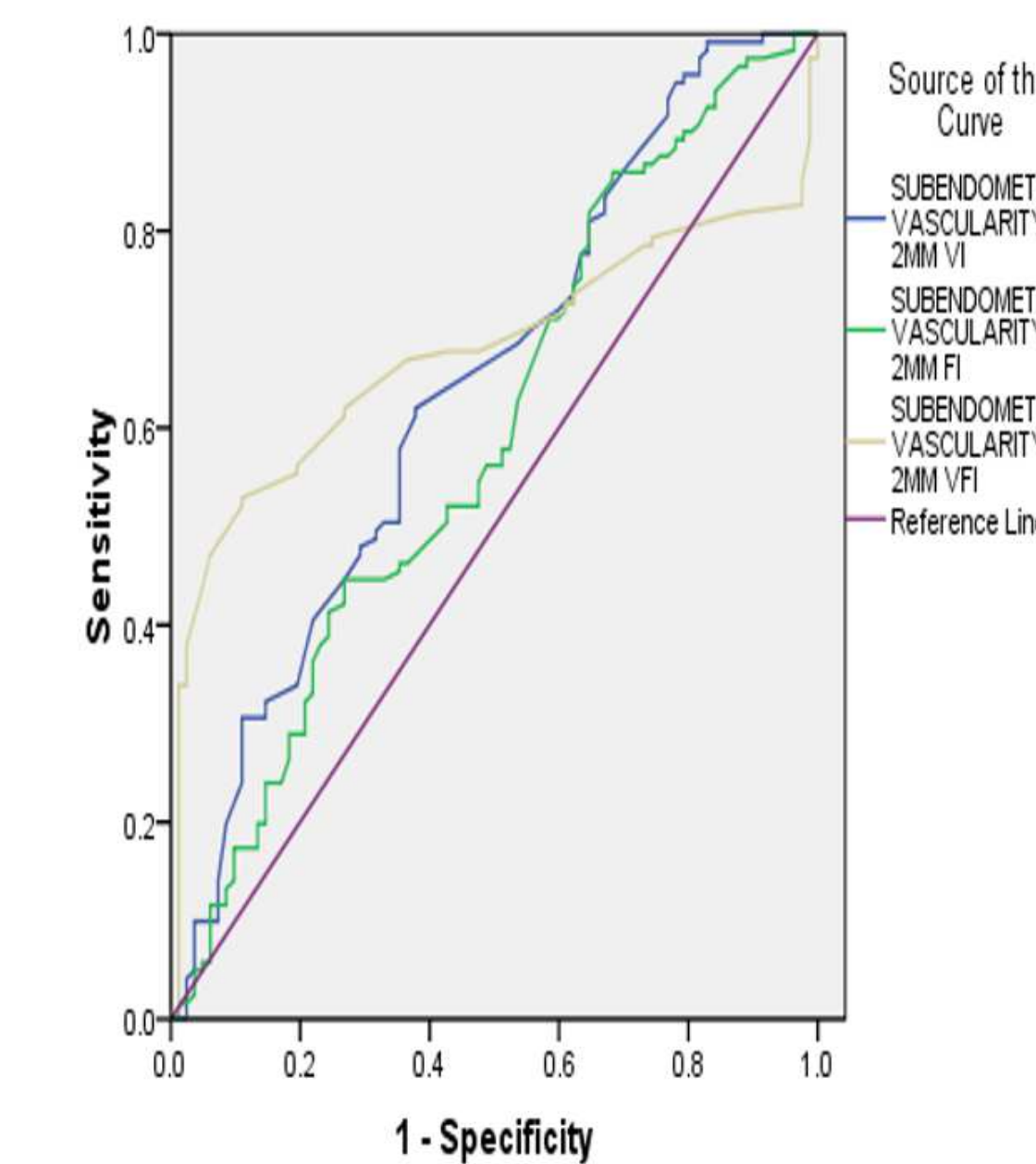
Sr No	Attributes	Pregnant (n=121)	Nonpregnant (n=82)	P Value
1	Age (years)	31.5±4.6	31.2±5.5	0.61
2	BMI (Kg/m2)	26.5±4.0	26.1±4.6	0.5
3	Type of Infertility			0.11
a.	Primary % (n)	65.3% (79)	75.6% (62)	
b.	Secondary % (n)	34.7% (42)	24.4% (20)	0.68
4	Duration of Infertility	6.7±4.4	6.9±4.4	0.68
5	Cause of Infertility			0.05
a.	Female Factor % (n)	46.3% (56)	32.9% (27)	
b.	Male Factor % (n)	25.6% (31)	40.2% (33)	
c.	Combined Factor % (n)	22.5% (26)	14.6% (12)	
d.	Unexplained Factor % (n)	6.6% (8)	12.2% (10)	0.16

Parameter	Pregnant (121)	Non pregnant (82)	P value
1 Endometrial Thickness (mm)	9.7±1.4	9.8±1.6	0.83
2 Endometrial volume (ml)	2.9±0.8	2.7±0.7	0.17
3 Endometrial VI (%)	3.3±1.2	2.8±0.6	0.01
4 Endometrial FI (0-100)	24.9±3.0	23.1±2.7	0.01
5 Endometrial VFI (0-100)	1.4±0.5	1.1±0.3	0.01
6 Subendometrial VI (%)	5.2±1.5	4.4±1.9	0.01
7 Subendometrial FI (0-100)	26.0±3.5	25.0±3.7	0.04
8 Subendometrial VFI (0-100)	2.7±1.1	2.2±0.6	0.01

ROC Curve



ROC Curve



Conclusions

- In patients undergoing autologous, artificial frozen thawed embryo transfer cycles, endometrial and subendometrial vascularity characteristics on the day of starting progesterone had a positive correlation with pregnancy & ongoing pregnancy rates.
- 3d vascularity parameters are better correlated with pregnancy outcomes when compared to 2d parameters like endometrial thickness, pattern and zone of vascularity.
- Endometrial and subendometrial vascularity by 3D power Doppler can be a useful novel parameter in predicting pregnancy in FET cycles.

References

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