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Original Research

Assessment of ovarian volume in case of infertility using spectral color doppler and transvaginal 3D ultrasonography

[1]Shama Batra, [2]Shuchi Rohatgi

[1]Associate Professor, Department of Obstetrics & Gynaecology, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India;
[2]Associate Professor, Department of Radio Diagnosis, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

ABSTRACT:
Background: The intricate equation of ongoing hormonal fluctuations is fertility. The inability of a woman to conceive after a year of unprotected sexual activity for those under 35 and six months for those over 35 is known as infertility. The present study assessed ovarian volume in case of infertility using spectral color doppler and transvaginal 3D ultrasonography. **Materials & Methods:** 80 females between the ages of 20 and 40 years were included in both infertility (40) and pregnancy control groups (40). Basal ovarian volume was measured intravaginally using GE Voluson S8 USG-machine, Logiq p9 USG machine. **Results:** 40 subjects in the infertile group and 40 subjects in the control group in the age group of 21-33 years while 5 subjects in the infertile group and 7 subjects in the control group belonged to the age group of 34-39 years. The difference was non- significant (P> 0.05). Ovarian volume less than11.75 cc was seen in 36 patients in infertile group and 32 patients in the control group. Ovarian volume (in cc) of more than or equal to 11.75 was seen in 4 patients in the infertile group while 8 patients in the control group. The difference was statistically significant (P< 0.05). **Conclusion:** Ovarian volumecan be used as predictors for determining infertility state among females of reproductive age group.
Key words: Fertility, Ovarian volume, Women

Corresponding author: Shuchi Rohatgi, Associate Professor, Department of Radio Diagnosis, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

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INTRODUCTION

The intricate equation of ongoing hormonal fluctuations is fertility. The inability of a woman to conceive after a year of unprotected sexual activity for those under 35 and six months for those over 35 is known as infertility.[1,2]Reproductive aging is considered to be the consequence of a decrease in the quantity and quality of the ovarian follicle pool.[3] Investigations into human ovarian autopsies show that, in females, the number of follicles progressively decreases with age, starting in the womb and continuing until after menopause. However, even among women of the same chronological age, there can be notable differences in the quantitative ovarian reserve.[4]

Compared to basal body temperature, ultrasound is a more accurate and cost-effective method of determining the time of ovulation than hormone profiles. Retrieving eggs and replacing embryos both use ultrasound.[5] In the treatment of infertility, ovulation detection is critical.

There has been evidence in the literature that reduced fertility linked to reproductive aging is correlated with both the total ovarian volume and the number of antral follicles as measured by transvaginal ultrasound. In the realm of medicine, color doppler has become a useful new diagnostic imaging technique in recent years, particularly in areas connected to infertility.[6] Intrauterine lesions, endometrial receptivity, polycystic ovary, follicle monitoring, failed or ectopic pregnancy, male infertility, and uterine, endometrial, and ovarian vascularity are examples of uterine abnormalities. According to our assessment, color Doppler is a high-throughput, complex video technology.[7]The present study assessed ovarian volumein case of infertility using spectral color doppler and transvaginal 3D ultrasonography.

MATERIALS & METHODS

The present study comprised of 80 females who gave written consent for the participation in the study.

Data such as name, age, etc. was recorded. Patients between the ages of 20 and 40 years were included in both infertility (40) and pregnancy control groups (40). Basal ovarian volume was measured intravaginally using GE Voluson S8 USG-machine, Logiq p9 USG machine. Results were tabulated and subjected to statistical analysis. P < 0.05 was considered significant.

RESULTS

Table I Association between age and infertility

Age(inyears)	Group		Total
	Infertile(%)	Control(%)	
21-33	35	33	68
34-39	5	7	12
Total	40	40	80
p value	0.47		

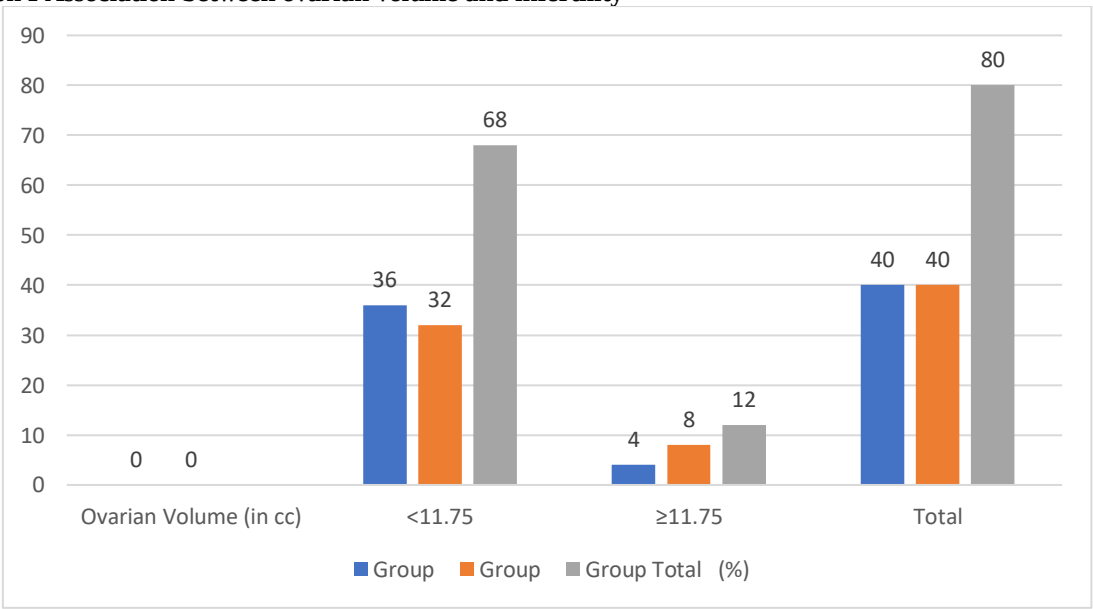
Table I shows that based on the criterion of >33 years which gave sensitivity and specificity of 12% and 92% respectively that 40 subjects in the infertile group and 40 subjects in the control group in the age group of 21-33 years while 5 subjects in the infertile group and 7 subjects in the control group belonged to the age group of 34-39 years. The difference was non- significant (P> 0.05).

Table II Association between ovarian volume and infertility

Ovarian Volume(incc)	Group		Total(%)
	Infertile(%)	Control(%)	
<11.75	36	32	68
≥11.75	4	8	12
Total	40	40	80
p value	0.05		

Table II, graph I shows that ovarian volume less than11.75 cc was seen in 36 patients in infertile group and 32 patients in the control group. Ovarian volume (in cc) of more than or equal to 11.75 was seen in 4 patients in the infertile group while 8 patients in the control group. The difference was statistically significant (P< 0.05).

Graph I Association between ovarian volume and infertility



DISCUSSION

Three-dimensional ultrasound (3D-US) is a rapidly developing area of clinical imaging. The ongoing research and continuous improvements in 3D-US have a significant impact on many areas of clinical application.[8,9]Successful implantation depends on the interaction between the blastocyst and the endometrium. Thickness of endometrium and a good blood supply are considered to favour pregnancy.[10] Increased endometrial and subendometrial vascularity have been found to be higher in patients with live births following Assisted Reproductive Technology (ART) than in those who have suffered a miscarriage. However, conflicting results are reported with regard to their role in the prediction of pregnancy in ART treatment.[11,12]The present study assessed ovarian volumein case of infertility using spectral color doppler and transvaginal 3D ultrasonography.

We found that 40 subjects in the infertile group and 40 subjects in the control group in the age group of 21-33 years while 5 subjects in the infertile group and 7 subjects in the control group belonged to the age group of 34-39 years.In the study by Agarwal et al[130], mean AFC count was 9.60 in the infertile group and 12.53 in the control group and the difference between them was found to be statistically significant (p = 0.002).

We found that ovarian volume less than11.75 cc was seen in 36 patients in infertile group and 32 patients in the control group. Ovarian volume (in cc) of more than or equal to 11.75 was seen in 4 patients in the infertile group while 8 patients in the control group. Ribeiro SC et al[14], found mean total ovarian volume to be 10.86 in the infertile group (cases) while it was 11.36 in the healthy group (controls) and the difference between the two groups was not statistically significant (p = 0.41).

Ng EH et al[15] in which they studied effects of age on hormonal and ultrasound markers of ovarian reserve in Chinese women with proven fertility and found that mean peak systolic velocity (PSV) was differentin different age groups – in ≤20 years, it was 10.35 cm/sec, in 21-30 years, 10.10 cm/s, in 31-40 years, 12.10 cm/s and 41-50 years, 11.45 cm/s respectively.

CONCLUSION

Authors found that ovarian volumecan be used as predictors for determining infertility state among females of reproductive age group.

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