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CJOG CLINICAL JOURNAL OF OBSTETRICS AND GYNECOLOGY
ISSN 2640-2890

Research Article

A two-phase sonographic study among women with infertility who first had normal sonographic findings

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Abstract

Introduction: Sonographic scan tests are real-time procedures but the female reproductive systems are subject to continued changes beyond the mid-menstrual period. Therefore a second test may be useful after mid-menstrual ultrasound tests among women with infertility who first had normal ultrasound tests during the mid-menstrual period.

Aim: The aim of this study is to find out whether physiological changes beyond the mid-menstrual period in the female reproductive system could develop into findings that could be missed at the first ultrasound test among women with infertility during mid menstrual period.

Method: One hundred and forty (140) women participated in this study, over a period of 12 months. The inter-observer correlations were carried out. The ultrasound test measured the diameters of the endometrium and ovarian follicle. The study was carried out during the mid-menstrual cycle when normal changes are optimal. The subjects were women of childbearing age (18 years - 40 years) with 28 days cycles who were referred from the fertility clinic. Women who had previous pelvic surgery, women on fertility therapy, and women who were unsure of the date were excluded from the study. Only women who met the inclusion criteria were selected for the study. The selection was by convenience sampling method. The women underwent the first phase of the ultrasound test during the mid-menstrual cycle. Those who had ultrasonographic-positive infertility reports were returned to the referral clinic. Only women who had normal ultrasonographic fertility reports were included in the second phase of further ultrasonographic tests. The scans were carried out further for four days for this second phase study and the result was again compared with normal values. (Endometrium Normal range 7.4 mm - 13.5 mm and ovarian follicles normal range 17.4 mm to 23.5 mm).

Results: The first phase of the scan showed 108 (77%) of the women had positive infertility results for endometrium and ovarian follicles, while 32 (23%) of the women had a normal ultrasonographic result and were rescanned over days. The findings of the second phase scan showed that 10 subjects (7.30%) showed new abnormalities, Findings were distributed in three sub-groups in this second phase of the study. Sub-group A, 4 (2.67%) had enlarged unruptured follicles, sub-group B, 6 (4.30%) had an endometrial cavity filled with fluid, sub-group C, 22 (15.70%) subjects still had normal scans who may be referred for other studies.

Conclusion: Women with infertility who had a normal scan at the mid-menstrual cycle should be followed up with a second-phase ultrasound scan before other tests.

More Information

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Submitted: November 29, 2022
Approved: December 14, 2022
Published: December 15, 2022

How to cite this article: Ochie K, Abraham John C. A two-phase sonographic study among women with infertility who first had normal sonographic findings. Clin J Obstet Gynecol. 2022; 5: 101-103.

DOI: 10.29328/journal.cjog.1001117

Introduction

Infertility is the failure to achieve conception after 12 months or more of regular uninterrupted sexual intercourse. Infertility is a global health issue among people of reproductive age. It is estimated that about 48 million couples and 186 million individuals live with infertility [1]. In the female reproductive system, infertility may be caused by a range of abnormalities of the ovaries, uterus, and fallopian tube, and errors in the endocrine system among others. Infertility is a multidimensional problem with social, economic, and cultural implications which can take a threatening proportion in countries and communities [2]. However, it has been observed that even in couples that do not seem to have reported a problem with infertility, it can take some time for such couples to achieve pregnancy [3]. There is a need to improve the adequacy of the test results even when the couples do not seem to believe that they have problems with infertility. This work further studied the women with secondary infertility who had undergone the first ultrasonographic tests of the reproductive

system of the pelvic organs in the mid-menstrual period and was found to have no ultrasonographic abnormalities detected in the ovarian follicle and endometrium. The study was carried out in two stages.

Method

An ultrasonographic scan was carried out with a trans vaginal probe of 5 MHz and a transabdominal probe of 3.5 MHz probe among 140 women of childbearing age (18 years - 40 years) who were referred for an ultrasound due to infertility from the fertility clinic. The study was carried out during the mid-menstrual period of each of the subjects. Only women who had 28 days cycle were selected for the study. The women who had previous pelvic surgery, women who were on fertility therapy, and women who were unsure of the date were excluded from the study. The convenience sampling method was used for the selection of the subjects. 140 women who met the inclusion criteria were selected. Ethical clearance was obtained. All 140 women underwent the first ultrasonographic study of the ovarian follicles and endometrium. The measurement of the diameters of these structures was taken across the maximum diameter and compared with normal values. Normal values adopted were; follicular size 17.5 mm to 23.4 mm and normal endometrial thickness 7.4 mm to 13.5 mm [4]. One hundred and eight (77%) of the subjects had abnormal ultrasound results and were returned to the referral clinic. 32 (23%) of the subjects had normal sonographic measurements of the ovarian follicles and endometrium. The 32 subjects with normal measurements were moved to the second phase of the study. They were scanned further for four days and their results were again compared with the normal values.

Interobserver reliability correlation tests were carried out using Pearson correlation in the measurement of the endometrial thickness and the measurement of the follicular diameter. The inter-observer correlation endometrial thickness measurement was 0.997 and the inter-observer correlation for follicle size was 0.797. The lower result may be due to the individual techniques for the measurement.

Results

One hundred and eight (77%) of the subjects had abnormalities reported on their ovarian follicles and endometrium. Some follicular sizes were smaller than normal (normal range: 17.5 to 23.4) with results ranging from 4.25 mm to 4.40 mm while some endometrium was thin (Normal range: 7.4 mm - 13.5 mm) ranging from 2.0 mm - 5 mm. The biochemical results showed that the Follicle-Stimulating Hormone (FSH) and progesterone were low and Luteinizing Hormone (LH) was normal, while prolactin was high among these subjects who had abnormal sonographic findings (Tables 1-4).

One hundred and forty (140) women with infertility were scanned. 108 (77%) had positive results of infertility while 32 (23%) had negative results. 32 (23%) of the subjects with normal sonographic measurements were moved to the second phase of the study. This group was re-scanned after days, with 3 sub-groups of findings. Sub-group A was 4 (3.00%) subjects with enlarged un-ruptured follicles. Sub-group B was 6 (4.30%) with fluid-filled endometrial cavities. Sub-group C were 22 (15.70%) subjects still with normal findings in the test. The enlarged un-ruptured follicle are consistent with luteinized Unruptured Follicles (LUF) which are follicles that failed to rupture and ovulate, instead, the follicles continued to grow up to 26 mm and above after four days. Without the release of oocytes, no pregnancy can take place [5]. This condition can be regarded as anovulation [6]. If the days of the scan are not extended in a normal scan, LUF may be omitted in sonographic investigations. An endometrial cavity filled with fluid, found in 4.30% of the subjects, is one of the signs of endometritis sonographically. Laboratory culture analysis is required as a follow-up to confirm endometritis which is a cause of infertility. 22 subjects (15.70%) still showed normal findings. This is in line with the findings of Strowitziki, et al. (2006) that more than 6 % of women with a report of infertility are unexplained [7].

Although the scope of this study is limited to the Second phase of the study, Tables 3 and 4 shows anatomic and biomedical values in a group of women who were returned to the referral clinic in the first phase of the study.

The follicular sizes and endometrial thickness were smaller than normal while the biochemical analysis shows high prolactin (Hyperprolactinemia) which can disrupt

Table 1: Distribution of the subjects for the first scan.

Report of the first Scan	Frequency	Percentage %
Abnormal follicle/Abnormal Endometrium	108	77
Normal Follicle/Normal Endometrium	32	23
Abnormal Uterus	0	0
Total	140	100

Table 2: Distribution of the anatomic findings of the second (phase two) of the study.

Endometrial Thickness (mm)	Follicular size (mm)	New Findings	Frequency	Percentage
10.5 - 12	26 - 27	Enlarged un-ruptured follicle	4	3.00
9 - 12	19 - 20	Fluid-filled Endometrium	6	4.30
8 - 9	18 - 20	Normal findings	22	15.70
Total			32	23.00

Table 3: Measurements of the endometrium and follicular size among women with infertility.

Organ	Mean Size	Range	Normal Range
Follicle Size Endometrium	4.40 mm 3.6 mm	4.25 - 4.40 mm 2.00 - 5.00 mm	17.5 - 23.5 mm 7.4 - 13 mm

Table 4: Hormonal profile of the subjects.

Hormone	Normal	Result Obtained	Status
Luteinizing Hormone (LH)	1.69 - 61 U/L	3.6 iU/L	Normal
Follicle Stimulating Hormone (FSH)	3.3 - 12.91 U/L	2.3 iU/L	Low
Prolactin	78 - 455 nMol/L	521 nMol/L	High
Progesterone	> 14.3 nMol/L	9.5 nMol/L	Low

ovulation and hence fertility. The follicles failed due to hyperprolactinemia. The hyperprolactinemia and low progesterone disrupted follicular and endometrial growth which would cause fertility failure [8].

Conclusion

Subjects who have normal sonographic scans should continue with a delayed second phase scan before other tests follow. More accurate results may be obtained with the two-stage ultrasound tests. The two-phase ultrasound test could reveal additional findings. The second ultrasound test should be added when the first test shows normal findings.

References

1. WHO. int 14 Sept. 2020
2. Rupa Z, Polikandnot M, Sotiropoulou P, Gourni M. Health Science Journal. 2009; 3(2):80-87
3. Simone M Kelly, Toughs Tulandis. The evaluators of female infertility. Journal of Sex Reproductive Medicine. 2002; 2(3);105-110.
4. Ochie K, Eze CU, Okoye GC, Ohagwu CC, Luntsi G. Mid Menstrual Cycle Ultrasound Evaluation Of Edimetrial Thickness Of Fertile Women And Women With Secondary Infertility In Nsukka. Journal of Radiography, Sciencedirect.com/Science. 2016;217-222.
5. https://academic.oup.com
6. Fertililypediahttps://fertilitypedia.org
7. Strowitzki T, Germeyer A, Popovici R, von Wolff M. The human endometrium as a fertility-determining factor. Hum Reprod Update. 2006 Sep-Oct;12(5):617-30. doi: 10.1093/humupd/dml033. Epub 2006 Jul 10. PMID: 16832043.
8. https://www.reproductivefact.org