Original Article

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Association between Polycystic Ovarian Syndrome and Endometrial Thickness on Ultrasonography in the infertile females of Lahore

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ABSTRACT

Background and Objectives: PCOS is a health problem that effect a wide range of women of childbearing age and causing infertility all over the world. At any age, PCOS can be distressing to women, especially during the reproductive years. To find the Association between polycystic ovarian disease and endometrial thickness on ultrasonography in the infertile females of Lahore.

METHODOLOGY: A total of 142 Pelvic Ultrasounds of female patients were included in the study. Their age range from 18 years to 60 years. All of these cases of PCOS were reported during study. This study was carried out in Radiology Department of Services Hospital and Ultrasound Clinic Green Town, Lahore .A Convenient sampling technique was adopted.

RESULTS: Data analysis showed that the mean age of 142 patients was 31.49 and the S.Dwas 9.363. Out of total number of 142 patients, 39(27.5%) were suffering from PCOS and 103 (72.5%) with no PCOS. Out of 142 patients 44 had <0.7mm Endometrial Thickness in which 15 had PCOS and 98 patients had > 0.7mm Endometrial Thickness in which 24 were with PCOS.

CONCLUSION: PCOS is an emerging disease and causing infertility in Pakistan. We could not find any association between PCOS and Endometrial thickness.

KEYWORDS: PCOS, Endometrial thickness, Pelvic ultrasound.

INTRODUCTION

Polycystic ovarian syndrome is the most common endocrine disease occurring in women during their fertile age consequences of reproductive , metabolic ,pysiological features. Symptoms including the menstrual cycle abnormality, an ovulation, excessive hair growth, acne and polycystic ovarian morphology 2 Female reproductive tract consists of these parts vagina, uterus with Fallopian tubes and ovaries. The uterus is an hollow muscular organ with thickened walls located in the true pelvis with urinary bladder which is present anteriorly to the uterus and to the rectum posteriorly.3.4 The major parts in which the uterus is divided are Body and Cervix .There are two structures called Fallopian tubes which are tube , have their ostia opening into the cavity of the upper part of the body of the uterus.The uterus has a very sig¬nificant function in reproduction involving transport of sperms, implantation of embryo, provide nour¬ishment to developing fetus, labor and delivery of the baby.5,6

The organs of reproduction including the uterus, fallopian tubes and upper 4/5th of vagina are shaped when still in utero.7,8 Ovary is a paired intraperitoneal endocrine organ normally found in the lower right and left quadrants of the abdomen. The ovaries play an important role inthe production of hormones as well as reproduction.9Ultrasound is one of the most common modality to evaluate the ovaries.10

The size of a normal ovary is 2.0 cm in width, 3.5 cm in length and 1.0 cm in thickness; this is the size of a golf ball. The volume of the ovary changes as females ages. It is found that 69% of changes in ovarian volume may be solely due to age. At two years old, the volume of the ovary averages of 0.7 ml. At 20 years of age, the volume will at peak of 7.7 ml. After this, the volume will decrease slowly until menopause, where the average volume is 2.8 ml.11 There are over three million new cases of polycystic ovarian syndrome

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(PCOS) in the United States alone. PCOS has a wide range of symptoms but typically presents with oligomenorrhea, acne, hirsutism, and infertility.12 Despite these criteria, PCOS may show differences in clinical features, based on the degree of severity of androgen levels, gonadotrophins, and insulin resistance.It has also been suggested that ethnicity as well as religious and cultural background of PCOS patients is an important contributory factor towards heterogeneity of PCOS.13Among these, anovulation infertility is one of the most alarming associated morbidities, as it currently affects approximately 48.5 million women aged 20–44 years.14

The syndrome's etiology is still unidentified, but it is possibly multifactorial, may be due to an alteration of the primitive hypothalamic regulation and of the ovarian and/or adrenal steroidogenesis. The diagnosis of PCOS is created on the clinical, hormonal and ultrasound patterns. In accordance with Rotterdam Criteria, drawn in 2003, PCOS diagnosis can be made only after the exclusion of other reasons of hyperandrogenism and amenorrhea, and in the presence of at least 2 of the following criteria ,1. Oligo- and/or anovulation with menstrual irregularities ,2.Elevated levels of circulating androgens or clinical manifestation of hyperandrogenism,3. Transvaginal pelvic ultrasound evidence of micro polycystic ovary. Due to the pulsatility of LH, only one blood parameter is not enough for the PCOS diagnosis, and there is no common agreement on which androgen blood's level should be considered for a exact diagnosis. . Since menarche, or after a short period, menstrual cycles show an irregular rhythm. Menstrual dysfunction in women affected by PCOS may present in different ways, but the probably most common way is anovulation with unpredictable bleedings . Androgens excess is responsible for hirsutism, oily skin, acne and, in the ovary, for the thickening of the tunica albuginea.At the same time an overweight pattern, up to obesity can be associated to the syndrome. PCOS is one of the most common endocrine causes of female infertility. 15The National Institutes of Health (NIH) criteria 1990 included hyperandrogenism, oligo-ovulation, and exclusion of other disorders mimicking PCOS, as the diagnostic criteria. However, 20 - 25% of regularly ovulating women have PCOS on ultrasound examination. The abnormal ovarian morphology is consistent with PCOS but not essential for diagnosis. Moreover, recent reports indicate that ovarian morphology is no longer an indispensable diagnostic criterion of PCOS.16 The endocrine society, however, recommended that PCOS can be diagnosed if the adult women presents with two of the following features i.e., excess production of androgens, an ovulation and pearl-sized cysts found in the ovaries.17There is considerable heterogeneity of symptoms and signs among women with PCOS and for an individual these may change with time .18

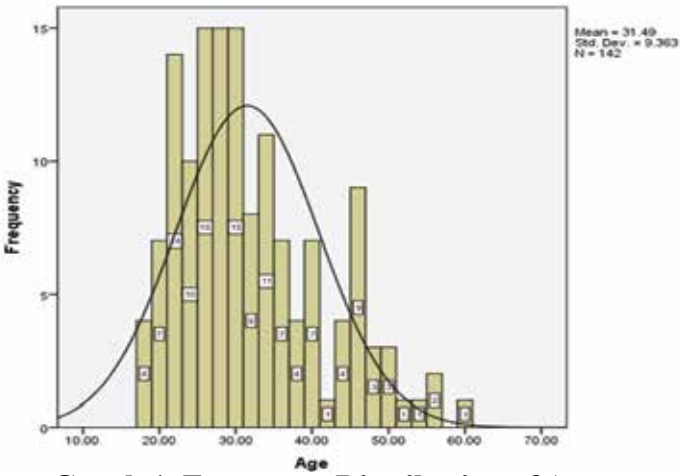
Infertility is very common social,economical and medical problem . There are various causes of infertility such as PCOS, endometrial thickness and adnexal masses. Endometrial thickness play a vital role in infertility .

METHODOLOGY

It was an analytical study to evaluate the association between PCOS and Endometrial thickness. Sample size was 142 ,all the gynecological ultrasounds were included during the 7 months of data collection. Data was collected from Services Hospital Lahore and Ultrasound Clinic Green Town Lahore.Convenient samplingtechnique was used. The inclusion criteria was infertile females above 18 years .The exclusion criteria was male infertility. Evaluation of PCOS and Endometrial Thickness was recorded using Ultrasound machine.

RESULTS

Data analysis showed that the mean age of the patients was 31.49 and the S.D was 9.363. Out of total number of 142 patients, 39(27.5%) were suffering from PCOS and 103 (72.5%) were without PCOS. Out of 142 patients 44 had <0.7mm Endometrial Thickness in which 15 had PCOS and 98 patients had > 0.7mm Endometrial Thickness in which 24 were with PCOS .1 (0.7%) had bulky uterus ,1 (0.7) had dermoid cyst , 29(20.4) had dominant follicle ,3(2.1) had haemorrhagic cyst ,1(0.7) had multiple fibroid ,20(14.1) had no other disease, 26(18.3) had ovarian cyst ,22(15.5) had uterine fibroid.



Graph 1. Frequency Distribution of Age .

This graph showed that total 142 female patients were participated in the research.Their age range from 18 years to 60 years.The mean age of the patients was 31.49 and the S.D was 9.363

Table 1. Uterus Location

Uterus location

	Frequency	Percent
Anteverted	128	90.1
Retroverted	14	9.9
Total	142	100.0

This table shows that 142 patients participated .Out of 142 patient 128 (90.1) were having Anteverted uterus and 14 (9.9) with Retroverted Uterus .

Table 2. Cross tabulation between ET Groups and PCOS

Cross tabulation between ET Groups and PCOS

			PCOS		Total
			NO	YES	
ET Groups	<0.7	Count	21	7	28
		% within ET Groups	75.0%	25.0%	100.0%
	≥0.7	Count	84	30	114
		% within ET Groups	73.7%	26.3%	100.0%
Total		Count	105	37	142
		% within ET Groups	73.9%	26.1%	100.0%

This table shows that out of 142 patients 7 were having Endometrial Thickness <0.7 and 30 with≥0.7 Endometrial Thickness. There was no statistical association found in PCOs and endometrial thickness as the p-value = 0.370 > 0.05.

DISCUSSION

Our study was designed to determine the comparison between Polycystic Ovarian syndrome and Endometrial Thickness on Ultrasonography in the Infertile Females of Lahore. Ultrasound clearly images and measure the whole uterus and the ovaries.Data was collected according to age,history and duration ofsymptoms and ultrasonographicfindings. Data of 142 patients was collectedfrom Services Hospital Lahore and Ultrasound Clinic Green Town Lahore. NoppakornPrakansamut et al (2014) assessed the endometrial thickness and other clinical characteristics associated with endometrial hyperplasia. Women with PCOS and abnormal menstrual pattern were enrolled into this cross-sectional study. Endometrial thicknesses were evaluated using transvaginal sonography. Out of 52 PCOS patients with abnormal menstrual pattern, nine (17.3%)had endometrial hyperplasia. There was no significant difference in mean endometrial thickness between those who had abnormal and normal endometrium (8.19 2.58 mm and 7.76 4.03 mm, respectively). Nineteen point two percent (19.2%) of patients with PCOS and abnormal menstrual pattern had endometrial hyperplasia .Endometrial thickness was not different between those with abnormal and normal endometrium.There is no association between Endometrial Thickness and PCOS.19

Another study was done by Bina Shah MD et al(June 2010), to asses endometrial thickness ,uterine and ovarian ultrasonographic features in adolescents with polycystic ovarian syndrome. Their aim was to evaluate uterine and ovarian ultrasonographic features including endometrial thickness (ET) in adolescent females with PCOS.They performed a retrospective chart review of young females (n = 51) ranging in age from 10 to 18 years with the diagnosis of PCOS. Clinical, biochemical and pelvic sonography data were reviewed. Sonographic data included uterine parameters of ET. Uterine features revealed that the endometrial stripe was enlarged (>7 mm) in 16/51 (31.4%) of girls, all with homogeneous appearance. The uterine length was lower than normal in 22/51 (43.1%) of girls, normal in 21/51 (41.2%), and higher than normal in 8/51 (15.7%). Uterine volume was normal in 31/51 (60.7%) and higher in 20/51 (39.3%) of girls. Out of total number of 142 patients,39(27.5%) were suffering from PCOS and 103 (72.5%) with no PCOS. Out of 142 patients 44 had <0.7mm Endometrial Thickness in which 15 had PCOS and 98 patients had > 0.7mm Endometrial Thickness in which 24 were with PCOS.20

This Cross Sectional study was done Saima Farooq et al (November 2015 to May 2016), determine the frequency of endometrial hyperplasia in polycystic ovarian syndrome patients having raised endometrial thickness at tertiary care Hospital. Study was conducted during Six months from November 2015 to May 2016 at obstetrics and gynecology department of Dow University Hospital Karachi .Total 90 patients were studied; their mean age was 28.6+4.56 years, with mean duration of infertility as 5.15+1.4 years. Endometrial hyperplasia among patients of polycystic ovarian syndrome was 31.1%. Age >29 years, infertility >5 years, diabetes and smoking were significantly associated with endometrial hyperplasia, (P=0.001). In the polycystic ovarian experiencing women with raised endometrial thickness, the endometrial hyperplasia was 31.1%. Elevated age, prolonged duration of infertility, diabetes and smoking may be risk factors of endometrial hyperplasia. There is no significant asso

ciation between PCOS and Endometrial Thickness.21 Another study was done by Farooq SMY et al (March 2021), to determine the Sonographic co-relation between Adnexal Masses and Endometrial Thickness in Infertile Females. This Cross-sectional analytical study was conducted at Gilani Ultrasound Center, Lahore, Jamiat Hospital and Green town clinic, The University of Lahore. Study duration was 9 months. Sample size was 150 patients. Sampling technique used was convenient sampling. AllInfertile Females with adnexal mass, age of 18-45 were included in study. Out of 150 patients the mean age was 32±6.33,minimum age was 18 and maximum age was 45. The mean endometrial thickness was 0.78mmwith standard deviation 0.29, minimum endometrial thickness was .10 cm, maximumendometrial thickness was 1.69 cm. The chi-square test was used between adnexalmassand endometrialthickness shows that there is significant association because them. But according to our study there is no association between PCOS and Endometrial thickness.22

CONCLUSION

PCOS is an emerging disease and causing infertility in Pakistan. We could not find any association between PCOS and Endometrial thickness.

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Authors Contributions:

Sana Sahar, Naveed Asad, Humna Fatima and Sajid Amjad Iqbal: Substantial contributions to the conception.

Hafsa Malik, Javeria Zia, Shamim Ara, Muhammad Abdul Hannan: Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

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