



## Original Article

## Evaluation of Endometriosis and Uterine Fibroids Leading to Infertility in Females Using Ultrasonography

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## ABSTRACT

The most common complaint among women who visit for an ultrasound is infertility, and ultrasound should be the first imaging technique to assess these patients. **Objective:** The aim of this study is to study uterine fibroids and endometriosis causing infertility in females using ultrasonography. **Methods:** The study was carried out in Gujranwala Pakistan at Chatha Hospital, Gondal hospital, and Al-Amin diagnostic center. The sonographic scanning of the 95 patients are included in the study. The bladder must be sufficiently filled; the lower abdomen should be lubricated with a coupling agent. Start by scanning transversely from the symphysis pubis to the umbilicus. Then, tilt the probe sharply downward until the uterus appears in the center of the screen and the endometrial line is visible. Finally, increase the image's gain and freeze the result. **Results:** The uterine fibroids and endometriosis are mainly affected in the age group of 30-39 has the highest frequency of (44.2%). The Ultrasound finding of the disease is such that endometriosis has the frequency of 23(24.2%) patients and the uterine fibroids have the frequency of 43(45.3%) patients. Secondary infertility has a maximum frequency of patients that is 51(53.7%) and primary infertility has a minimum frequency of patients that is 44(46.3%). **Conclusions:** In this study, uterine fibroids and endometriosis cause infertility in women between the age between 20 years to 60 years. More females are affected at the age of 30-39 years. More infertility is caused by uterine fibroids.

## INTRODUCTION

The failure to conceive after a year of routine, unprotected sexual activity is known as infertility. In the general population, 84 percent of females are expected to conceive following a year of frequent unprotected sexual intercourse (which includes those with reproductive difficulties). This proportion rises to 93 percent after three years [1]. Infertility is usually considered valid after one year of unprotected sexual intercourse (sexual relations without contraception). Approximately 40% of infertility cases are caused by male causes [2]. 40% goes to female causes, with the remaining 20% split between male and female components and feminine characteristics. For example, sperm problems are a common cause of infertility [3]. Other causes include abnormal ovulatory failure, tubal

damage, endometriosis, coital problems, and cervical mucus [4]. Sonography can help with infertility diagnosis and therapy in the following ways: examining gynaecologic disorders connected to infertility, ovulation timing, tubal patency evaluation, and directing IVF treatments and Invasive procedures [5]. A comprehensive medical history and physical examination are performed on the infertile man. After then, laboratory testing and imaging are performed to identify a potentially fixable issue [6]. Imaging frequently enables the selection of the most effective method for fertilizing the female partner, such as intracytoplasmic sperm injection or image-guided sperm aspiration from the epididymis or seminiferous tubules. The study of male infertility is becoming more and more

significant as male characteristics have been recognized as a causal factor in up to 50% of infertile couples. Following the usual history, physical exam, and blood tests, imaging is frequently used to determine the volume and form of the testicles in the scrotum [7]. Concerning infertility in women. Assessing ovulation is crucial. Ovulatory anomalies infertile women account for roughly 40% of the population. A lack of ovulatory function in the majority of women manifests itself in monthly anomalies, which can be discovered through family history [8]. Menstrual irregularities should be looked into for underlying causes such as polycystic ovarian syndrome, thyroid disease, hyperprolactinemia, and issues related to the hypothalamus that affect weight changes [9]. A variety of methods can be used to identify ovulation, including endometrial biopsies to look for secretory endometrial growth, BBT records, LH ovulation prediction kits, and mid-luteal serum progesterone testing, and LH ovulation prediction kits. The fallopian tubes and uterus are inspected. As part of the conventional infertility evaluation, the uterine shape and tubal patency are also assessed [3]. Hysterosalpingography may be of assistance (HSG) [10]. After a radio-opaque substance is injected through the cervical canal, the uterine cavity and fallopian tubes are radiographically assessed. The concordance of HSG with laparoscopic dye perturbation is considered to be close to 90%, making it most effective when used in conjunction with laparoscopic dye perturbation to assess tubal patency. On the other hand, an HSG with patent fallopian tubes does not guarantee ovum pickup [11]. For instance, a woman with severe endometriosis may have normal fallopian tubes despite attached ovaries in the cul de sac. Ultrasound is used to find uterine polyps, fibroids, and congenital cavitory abnormalities such as a septate uterus during the follicular stage. Pelvic ultrasonography can indicate ovarian volume and antral follicle counts, making it an important aspect of the first infertility assessment [12]. For conditions like submucous leiomyoma, Asherman's syndrome, or uterine polyps, a thorough cavitory examination is necessary (uterine synechiae). Sonohysterography is a procedure in which ultrasonography is used to inspect the uterine cavity while sterile water is injected. Diagnostic office hysteroscopy is preferred by some clinicians because it allows them to observe the uterine cavity directly [13]. Because it could display the pelvic organs, developing ovarian follicles, intrafollicular structure, and cyclic uterine endometrial alterations, ultrasound became a useful technique in the diagnosis of infertility [14]. Ultrasound imaging is used to describe the ovarian artery and other ovarian landmarks. Regular monitoring of ovarian blood flow is possible. Multiple pregnancies arise when the ultrasound inspection

is repeated through ovulation in hormone-stimulated cycles with two or more follicles of the same diameter. The hazard of overstimulation can be calculated. Ultrasonography is even more crucial than estradiol because hormone testing cannot discriminate between one large, numerous media, or many microscopic follicles. The endometrium's cyclic alterations in histology are described, allowing ovulation to be predicted within 12 hours [15]. Ultrasound is a good way to determine ovulation time since it is more accurate than basal body temperature and less costly than hormone profiles. In egg harvesting and embryo replacement operations, ultrasound is used [16]. The capacity to detect ovulation is critical in the treatment of infertility. For a long time, hormone profiles were the only way to achieve this. Ultrasonography is currently widely used in diagnostic procedures in this field. It makes it possible to see the uterus, Fallopian tubes, and ovaries, identify genital anomalies, and see how these organs' physiological changes vary over the menstrual cycle [17]. The most common reason for the hysterectomy is uterine leiomyoma, which is a benign tumour of the human uterus. They cause severe morbidity, including prolonged or heavy menstrual flow, pelvic pressure or pain, and, in rare instances, reproductive failure, and are clinically apparent in up to 25% of women. Fibroids vary greatly in pathogenesis, size, location, and clinical symptomatology [18]. By the age of 50, the projected cumulative incidence of malignancies was more than 80% for black women and over 70% for white women [19]. Endometriosis is a chronic, inflammatory, estrogen-dependent illness that causes endometrial tissue to develop outside of the uterine cavity. Although the cause of endometriosis is unknown, immune dysfunction has been considered a major promoter of ectopic lesion formation following retrograde endometrial debris menstruation [20].

## METHODS

The study was carried out in Gujranwala Pakistan at Chatha Hospital, Gondal hospital, and Al Amin diagnostic center. The sonographic scanning of the 95 patients was included in the study. The sample size was calculated using a convenient sampling technique using mean frequency from previously published articles [21-23]. The bladder must be sufficiently filled, and the patient was inspected after one hour. The lower abdomen should be lubricated with a coupling agent, and the patient should be lying supine, calm, relaxed, and breathing quietly. Use enough coupling agent since hair anywhere on the abdomen can trap air bubbles. Start by performing a transverse scan from the symphysis pubis up to the umbilicus. Angle the probe sharply downward until the uterus appears in the

center of the screen and the endometrial line was visible, at which point you should adjust the gain and freeze the image. Then, from the symphysis pubis to the umbilicus, we must angle the probe sharply downward until the uterus and the endometrial line appear in the center of the screen, adjust the picture's gain, and then freeze it. At this point, I measured the length, AP diameter, and endometrial thickness. Next, I scanned from side to side to determine whether the uterine form was normal or abnormal, as well as the texture and size of any possible.

## RESULTS

The sonographic scanning of the 95 patients was included in the study. The bladder was sufficiently filled, and the patient was inspected after one hour. In the current study, Table 1 showed the age was distributed into 4 groups. The highest frequency of patients showed in the 30-39 age groups. The mean age was 34.5. The lowest frequency of patients was shown in the 50-59 age groups.

Age	Frequency(%)	Valid Percent	Cumulative Percent
20-29	30(31.6%)	31.6	31.6
30-39	42(44.2%)	44.2	75.8
40-49	20(21.1%)	21.1	96.8
50-59	3(3.2%)	3.2	100.0
Total	95(100.0%)	100.0	

**Table 1:** shows the age Distribution of patients with uterine fibroids and endometriosis

Table 2 showing that the patients with uterine fibroids showed the highest ratio of USG findings 43(45.3%) and the patients with endometriosis showed the lowest ratio of USG findings 23(24.2%). Patients with both (uterine fibroids and endometriosis) had a frequency of 29(30.5%).

Parameter	Frequency(%)	Valid Percent	Cumulative Percent
Endometriosis	23(24.2%)	24.2	24.2
Uterine Fibroids	43(45.3%)	45.3	69.5
Both	29(30.5%)	30.5	100.0
Total	95(100.0%)	100.0	

**Table 2:** Ultrasound findings of the patient with endometriosis and uterine fibroids

In Table 3, the patients with a secondary type of infertility showed the highest percentage 44(53.7%) and the patients with the primary type of infertility showed the lowest percentage 44(46.3%).

Type of Infertility	Frequency(%)	Valid Percent	Cumulative Percent
Primary	44(46.3%)	46.3	46.3
Secondary	51(53.7%)	53.7	100.0
Total	95(100.0%)	100.0	

**Table 3:** displayed the distribution of patients by type of infertility

## DISCUSSION

The study has been done in Gujranwala, Pakistan from 1<sup>st</sup>

January to 15<sup>th</sup> July 2022. From the population, randomly, a total of ninety-five patients (n= 95) were selected for the sample unit in this study. In the current study, the infertile women who have uterine fibroids and endometriosis are attended to the ultrasound department for the investigation of disease in Chattha Hospital, Gondal Hospital, and Al-Amin diagnostic center Gujranwala, Pakistan from where I have done my research. In this study, patients from different four age groups are studied which have an age range between 20 years to 60 years. The mean age is 34.5. The uterine fibroids and endometriosis are mainly affected in the age group of 30-39 with the highest frequency of 44.2% which is also supported by the study done by Nosiba Abdelaziz Bakhit Abdelrhman, *et al.*, in 2019 [21]. The lowest frequency of the patient is shown in the 50-59 age groups which is 3.2% and the other age groups show the frequencies of 20-29(21.1%) and 40-49(21.1%) shown in table 1. According to this study, the maximum age being affected is between 30-39 years with the result of 42 patients and a frequency of 44.2% and the minimum age being affected is between 50-59 years with the result of 3 patients and a frequency of 3.2%. In this study, the Ultrasound finding of the disease is such that endometriosis has the frequency of 23(24.2%) patients out of 95 patients and uterine fibroids have the frequency of 43(45.3%) patients. Both diseases (endometriosis and uterine fibroids) are indicated in the 29(30.5%) patients shown in table 2. All the patients come to diagnose the cause of infertility and according to my study, uterine fibroids are causing most of the infertility that is 43(45.3%) patients are affected by the uterine fibroids, (a main cause of infertility in females). This suggests that fibroid is the most frequent cause of irregular uterine bleeding. This is comparable to the research done by (Mr. Moawia Abelhman Abdallah Frag and El Shikh) [22-23]. All the selected patients come with different symptoms that can lead them to endometriosis and uterine fibroids. All the patients are in their reproductive period of life. All the patients come with menstrual disorders. According to current study, the type of infertility that is affecting most females is secondary infertility shown in table 3. In the current study, fig 4 and fig 5 show that secondary infertility has a maximum frequency of patients that is 51(53.7%) and primary infertility has a minimum frequency of patients that is 44(46.3%) respectively. In a current study due to the uterine fibroids, all the patients have an abnormal uterus size that is larger than normal which was related to the previous study by Doherty L in 2014. [24] A standard ultrasound exam is performed on the patients to collect images of the affected area such as transverse and sagittal cross-sections, that is consist of a series of static cross-sectional images. The main disadvantage of this technique

is insufficient sampling in which a structure will not be discovered if it is not adequately visible or is not present in the obtained individual planes. [25-26] Ultrasound has become a primary imaging tool in the assessment of pelvic diagnosis (uterine fibroids and endometriosis).

## CONCLUSIONS

In conclusions uterine fibroids and endometriosis cause infertility in women between the age of 20 years to 60 years. More females are affected at the age of 30-39 years. More infertility is caused by uterine fibroids. The study also concluded that secondary infertility has more infertile frequency than primary infertility.

## Conflicts of Interest

The authors declare no conflict of interest

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