

Original Article

Evaluation of Uterine Abnormalities in Women with subfertility Using Saline Infusion Sonography; A Retrospective Descriptive Study

Naushaba Malik¹, Qurra tul Ain², Shahbakht Aftab³, Saima Bibi⁴, Taqdees Iftikhar⁵, Shehnaz Sheeba⁶

¹Consultant Radiologist, PESSI Hospital, I-12, Islamabad

²Assistant Professor, MCHC, Pakistan Institute of Medical Sciences, Islamabad

³Postgraduate Resident, Pakistan Institute of Medical Science, Islamabad

⁴Assistant Professor, Dept of Obs & Gynae, Holy Family Hospital, Rawalpindi

⁵Associate Professor, Akhtar Saeed Medical College, Rawalpindi

⁶Assistant Professor, Dept of Obs & Gynae, PAF Hospital E-9 Islamabad

Correspondence: Dr. Naushaba Malik

Consultant Radiologist, PESSI Hospital, I-12, Islamabad

doctor.noshi100@gmail.com

Abstract

Objective: The objective of the study was to use saline infusion sonography to assess the prevalence of uterine abnormalities in women of Islamabad having otherwise unexplained subfertility.

Methodology: This retrospective descriptive study took place at Punjab Employees Social Security Institute (PESSI) Islamabad from Jan. 2017 to Jan.2021. The ethical review board of the institute approved the study. Patients who had normal investigations for male factor, ovulation and tubal patency were included in the study. Medical records of 240 women who had saline infusion sonography (SIS) at PESSI Islamabad were reviewed and studied. The researchers wanted to learn how common uterine abnormalities are in these women and whether there are any links between these abnormalities, patient age, and body mass index (BMI).

Results: Uterine abnormalities were found in 27.92% (67/240) of the women in the study. The most common abnormality was endometrial polyps (12.0%), followed by sub-mucous fibroids (5%), intrauterine adhesions (2.0%), and septae (6.0%). Women with primary infertility were more likely to have uterine abnormalities. Uterine abnormalities were most common in women aged 28-38 years. The distribution of abnormalities differed significantly by age group ($p=0.006$) and BMI ($p=0.020$).

Conclusion: Many women with unexplained infertility have uterine abnormalities that they don't know about. Therefore, all women with unexplained infertility should have their uterus examined.

Key words: Uterine Abnormalities, Endometrial Polyps, Uterine Fibroids, Intrauterine Adhesions, Uterine Septae.

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Introduction

A 2D transvaginal scan is a common way to check the shape and size of the uterine cavity in women who have trouble getting pregnant. However, it is not as accurate as other tests, such as saline infusion sonography (SIS) or hysteroscopy. SIS is a minimally invasive, affordable, and well-tolerated test.

One in eight couples may suffer from subfertility.¹ Evaluation of the uterus is an integral part of a routine infertility investigation as well as for evaluation before Assisted Reproduction Therapy. To simplify the investigation of uterine cavity by using less invasive and

low-cost procedures, new procedures that use contrast media to improve endometrial visualization during transvaginal sonography (TVS) were put into practice.^{2,3}

Saline infusion sonohysterography (SIS) is one such procedure.² It comprises transcervical instillation of sterile saline into the endometrial cavity during TVS. The saline distending the uterine cavity, allowing the anechoic fluid to delineate the echogenic endometrium. This method has been demonstrated to be effective and very sensitive for diagnosis of uterine conditions like endometrial polyps, submucous fibroid, synechiae, and

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uterine anomalies.^{2,3,4} SIS has been equally sensitive as gold standard diagnostic methods such as, hysteroscopy, hysterectomy and histologic sampling for evaluation women with Abnormal Uterine bleeding while being less invasive and cost effective.^{2,4,5}

It is imperative to diagnose intrauterine pathologies such as polyps, submucosal fibroids, septum or adhesions correctly in women about to undergo subfertility treatment, as these are proven adversely effect reproductive outcome. Further, these pathologies, that can often be rectified by surgical management, so that a woman's probabilities of successful outcome can be improved.^{2,3,6}

There are several ways to assess the regularity and shape of the uterine cavity, including conventional 2D and 3D transvaginal scan. It is generally used to screen for uterine abnormalities, but its accuracy is not high for detecting some conditions, such as polyps, adhesions, and submucous fibroids. Hysterosalpingograph carries risk of infection and is painful. Hysteroscopy though accurate in detecting uterine anomalies and lesions is invasive procedure, expensive, requires anesthesia and the equipment is often not available in most set ups.^{2,5} Due to being relatively less invasive and potential of high diagnostic accuracy, saline infusion sonography (SIS) has been suggested as a routine investigative modality to evaluate the uterine cavity in all subfertile patients.^{2,5} As it's the protocol in the researcher's hospital.

This study was conducted to see the presence of uterine anomalies using saline sonography in women in which there were no male factor, ovulatory or tubal causes of sub fertility and other investigations had been normal.

Methodology

This study looked at the medical records of women who had undergone saline infusion sonography (SIS) at at Punjab Employees Social Security Institute (PESSI) Islamabad from Jan. 2017 to Jan.2021. The study only included women whose records showed that there was no male, ovulatory or tubal factors of subfertility. The study also excluded women who had SIS for other reasons, who could not have SIS because of cervical stenosis or pain, or whose medical records did not clearly show that they met the criteria for unexplained infertility or whose record were incomplete. The study also excluded women who had uterine anomalies diagnosed prior due to other complaints like amenorrhoea or pelvic pain, medical disorders such as diabetes or thyroid disorder, or who smoked. All saline

sonography procedures had been performed in the Outpatient Department Basis hospital setting using the standard protocol of the hospital. Following aseptic measures, twenty to thirty Milliliters of a sterile saline solution was infused into the uterine cavity through a 5 or 7 French Foley catheter to expand the endometrial cavity. Transvaginal ultrasound was done simultaneously to see the live filling of cavity with saline. Any abnormalities were recorded. Mindray DP-2200 scanner with a transvaginal transducer of 5 to 7.5 MHz frequency was used to perform the scan. All scans were performed by specialists. A proforma was used to collect the data from hospital records. The demographic data included patient age, height and weight presence of primary/secondary subfertility were recorded in the proforma. The presence or absence as well as the type of abnormalities on saline sonography were also recorded.

Data was entered into statistical software SPSS version 24 to analyze the data. Percentages and proportions were calculated for different variables. Chi square test was applied to compare the associations between different groups. P value <0.05 was taken as significant.

Results

Uterine abnormalities were found in 27.92% (67/240) of the women in the study. The most common abnormality was endometrial polyps 12.0% (29/240), followed by sub-mucous fibroids 5% (12/240), intrauterine adhesions 2.0% (5/240), and septae 6.0% (14/240). Women with primary subfertility were more likely to have uterine abnormalities. The results are displayed in table I.

Table I: Various individualities of the study population

Characteristics	Range	N
Age (years)	Less than 28	22 (9.1%)
	29-38	180 (75.0%)
	Greater than 39	18 (7.5%)
BMI	Less than 18.5	24 (10.0%)
	18.5-24.9	96 (40.0%)
	25-29.9	110 (46.0%)
	Greater than 30	10 (4.1%)
Abnormality	Yes	67 (27.9%)
	No	173 (72.0%)
Abnormality type	Endometrial polyps	29 (12.0%)
	Sub-mucous fibroids	12 (5%)
	Septae	14 (6.0%)
	Intrauterine adhesions	5 (2.0%)
subfertility type	Primary	169 (70.0%)
	Secondary	71 (29.5%)

Table II: Comparison of women with and without abnormalities.

Characteristics		Uterine abnormality		P value
		Yes (n=67)	No (n=173)	
Infertility type	Primary	45 (67.1%)	102 (58.9%)	0.005
	Secondary	22 (32.8%)	71 (41.0%)	
Age (years)	Less than 28	6 (8.9%)	20 (11.5%)	0.442
	29-38	36 (53.7%)	134 (77.5%)	
	Greater than 39	25 (37.3%)	19 (11.0%)	
BMI	Less than 18.5	7 (10.44%)	17(9.82%)	0.086
	18.5-24.9	21 (31.3%)	52(29.3%)	
	25-29.9	34 (50.7%)	89(51.9%)	
	Greater than 30	5 (7.5%)	15((8.6%)	

Table III: Types of abnormalities as distributed across different age groups and BMI ranges.

Characteristics		Abnormality type				P value
		E. polyps N=29	Intrauterine adhesions N=5	Submucosa fibroids N=12	Septae N=14	
Age (years)	Less than 28	4 (20%)	0	3 (25.0%)	4 (28.6%)	0.006
	29-38	18 (62.0%)	4 (80%)	7 (58.3%)	7 (50.0%)	
	Greater than 39	7 (24.1%)	1 (20%)	2 (16.7%)	3 (21.4%)	
BMI	Less than 18.5	2 (6.8%)	1 (20.0%)	3 (25.0%)	2 (14.0%)	0.020
	18.5-24.9	8 (27.6%)	2 (40.0%)	3 25.0%)	5 (35.0%)	
	25-29.9	15 (51.7%)	2 (40.0%)	5 (41.7%)	6 (42.9%)	
	Greater than 30	4 (13.8%)	0	1 (8.3%)	1 (8.1%)	

Women with primary subfertility were more likely to have uterine abnormalities than women with secondary subfertility. ($p=0.005$). Uterine abnormalities were most common in the age group 29–38 years ($n=36$, 53.7%) and in overweight patients ($n=50.7%$). The results are shown in table II.

However, the type and distribution of abnormalities differed significantly in various age ranges ($p=0.006$). All pathologies were more common in the age range 29–38 years: polyps (62.0%), Intrauterine adhesions (80.0%), sub-mucous fibroids (58.3%) and septae (50.0%). Similarly, the types of uterine abnormalities varied significantly among women with different BMI. The results are mentioned in table III.

Discussion

Presence of uterine masses: polyps, fibroids, synechia and uterine anomalies is higher in women with subfertility than general population.^{2,4,5,6} Uterine abnormalities can be congenital (present from birth) or acquired (developed over time). The study found that 28% of the women had some type of intrauterine abnormality, with polyps being the most common. This is lower than the 40% rate of abnormalities reported some other researchers.⁷ This difference may be due to study design as in our study women whose record

showed tubal blockade on HSG/laparoscopy were excluded, some of these women may have had uterine anomalies and lesions apart from tubal blockade. A study in India revealed 18% of patients to have uterine lesions and abnormalities while undergoing workup for subfertility.⁸

Polyp was found to be the commonest lesion observed.^{2,5,8} Same has been observed in other studies too. Though uncertain, contribution of polyp to subfertility may be due to mechanical interference with transport of sperm, embryo implantation, through intrauterine inflammation and altered production of endometrial receptivity factors.^{8,9} They were seen both in women with normal and high BMI

Most women in the study were overweight. Although there was no association between weight and presence of uterine anomalies, polyps and synechiae but women who were overweight had higher prevalence of fibroids. Research has shown that the risk of developing fibroids is higher in patients with increased weight.¹⁰

Polyps were the most common uterine abnormality in both women with normal BMI and overweight women. Sub-mucous fibroids were most common in overweight women with a BMI of 25-29.9. Intrauterine adhesions and septae were not linked to BMI, as their development is not related to weight gain.

The study found that age and primary infertility were associated with uterine abnormalities. Women aged 29-38 years were more likely to have sub-mucous fibroids, and polyps. Intrauterine adhesions were less common in patients aged 39 and above. This may be because these issues might have caused other symptoms like menstrual irregularities, pain, discharge leading to their earlier detection. Women with primary infertility were more likely to have uterine abnormalities than women with secondary infertility. This finding is in contrast to that reported by another study, which showed that pathologies were more common in secondary infertility.¹¹ This may be associated with different types of abnormalities. Intrauterine adhesions were the most common type of abnormality in their analysis, whereas polyps and intrauterine adhesions were most common in this study. Similarly, none of the patients were found to have other complex congenital anomalies due to study design that excluded patients who had presented for saline sonography due to other causes, also other symptoms might have lead to their diagnosis earlier using other diagnostic modalities.

Conclusion

Uterine abnormalities are common in patients of infertility who otherwise have normal workup for male factor, ovulation and tubal patency. Our study found that many women with unexplained infertility have undetected uterine abnormalities. Therefore, all women with unexplained infertility should have a uterine cavity assessment. While these abnormalities are more common in certain groups of women, they can occur in women of all ages and body weights.

Strength & Limitations: This study evaluated medical records of patients seen over a significant time period. This study was retrospective and did not have follow-up data on pregnancy rates which is a limitation of the study. Further prospective studies with follow-up data are needed to assess the impact of uterine abnormalities on reproductive outcomes in women with unexplained infertility.

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