

To Study the Normal and Abnormal Pattern of Endometrial Lining of Uterus through Ultrasonography in Women of Reproductive Age Group in Area around North Bihar

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Abstract:

Background and Objectives: Ultrasonography is the first imaging modality used to demonstrate gynaecological anatomy and to evaluate physiological and pathological changes. to study the normal and abnormal pattern of endometrial lining of uterus through ultrasonography in women of reproductive age group.

Material and Methods: This is a cross-sectional study of 100 women of reproductive age group carried out during the period of November 2018 to September 2020 attending Department of Radiology, Sri Krishna Medical College and Hospital, Muzaffarpur.

Conclusion: This study showed that during reproductive age, most of the women have normal endometrial thickness depending upon their menstrual phase. 12% of the patients had endometritis. Inadequate aseptic precautions, low socioeconomic condition and emergency cesarean section might be responsible for such higher incidence.

Keywords: Ultrasonography, Endometrial Uterus.

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Introduction

Ultrasonography is the first imaging modality used to demonstrate gynaecological anatomy and to evaluate physiological and pathological changes. The endometrium demonstrates its wide spectrum of normal and pathological appearances throughout reproductive as well as during the prepubertal and postmenopausal years and the first trimester of pregnancy. [1] Dysfunctional uterine bleeding, adenomyosis, endometriosis, endometrial polyp, submucosal fibroids are seen in women of reproductive age group. Gestational trophoblastic disease during pregnancy, endometriosis and retained products of conception are seen in postpartum period. Endometrial hyperplasia, endometrial carcinoma are seen during perimenopause/ postmenopausal period. [2,3]

According to various studies the percentage of women reporting endometrial pathologies have rose manifold in the past two decades. [4] The present study may provide an opportunity to extend some valuable information in this area. Although numerous exhaustive works has been done in this area with copious scientific literature available, for most of these studies, postmenopausal women with abnormal uterine bleeding have remained favoured with limited studies on endometrial pattern in women of

reproductive age group. Hence, the present study is intended with the aim of documenting in detail the transabdominal ultrasonographic features of endometrium in women of reproductive age group. In majority of women, oestrogen withdrawal at menopause causes endometrial atrophy and the endometrium is only 1 to 3 millimetres in thickness. The atrophic endometrium is susceptible to infection resulting in senile endometritis and postmenopausal bleeding. The postmenopausal endometrium measuring more than 4mm is considered abnormal. Endometrial hyperplasia and polyp also occur when tamoxifen is administered to a women with breast cancer. [5,6]

Objectives

To analyse the incidence of normal morphological pattern of endometrium during different phases of menstrual cycle.

To analyse the incidence of abnormal morphological pattern of endometrium during reproductive age.

To analyse the endometrial changes during early pregnancy.

Materials and Methods

This is a cross-sectional study of 100 women of reproductive age group carried out during the period of November 2018 to September 2020 attending department of Radiology, Sri Krishna medical College and hospital, Muzaffarpur.

Inclusion criteria

Reproductive age group women in good general health were included in the study.

Exclusion criteria

- Paediatric age group
- Postmenopausal
- Hysterectomized
- Serious patients
- Late pregnancy

The ethical committee of Sri Krishna Medical College and Hospital, Muzaffarpur approved this study and subjects signed an informed consent before examination.

All the patients were subjected to Transabdominal ultrasonography. Grey scale transabdominal ultrasound was performed using 5 megahertz convex probe. Prior to examination, patients were asked to drink a minimum of 24 ounces of clear fluid at least one hour before USG, so that during ultrasonography the bladder remains partially distended. A distended bladder is used as an acoustic window to achieve better imaging of the uterus and adnexa.

The patient was then taken to the USG room and was asked to lie supine on the stretcher with abdomen exposed. A preliminary abdominal examination was done. Transabdominal ultrasonography was done in a partially distended urinary bladder. Care was taken to avoid unnecessary exposure with the use of towels tucked around the gown. This also aids in keeping unexposed areas clean from ultrasound gel. A small amount of ultrasound gel was put on the skin of the

lower abdomen with the ultrasound probe and scanning was done through this conductive gel. The gel helps the transducer make secure contact with the body and eliminate air pockets between the transducer and the skin that can block the sound waves from passing into the body.

The transducer was placed on the body and moved back and forth over the area of interest until the desired images were captured. The uterus was scanned in long axis with special emphasis on endometrium. The scanning of the uterus was first done in the sagittal plane from fundus to the internal os. The regularity of the uterus was noted. The length, anteroposterior measurements and transverse dimensions of the uterus were noted. Anteroposterior measurement of the endometrial thickness was taken. The measurement was of the thickest echogenic area from one basal endometrial interface across the endometrial canal to the other basal surface.

Results

The present study comprises of evaluation of Transabdominal ultrasonography findings of 100 women of reproductive age group attending Department of Radiology, Sri Krishna Medical College and Hospital, Muzaffarpur for investigation. The study was conducted over a period of 24 months and the data was analysed under the following headings.

- 1) Age distribution pattern
- 2) Showing different phases of menstruation.
- 3) Thickness of endometrium during different phases of menstruation.
- 4) Ultrasonographic findings among different age groups in reproductive period.

According to WHO, women of reproductive age refers to all women aged 15 to 44 years. Patients with pregnancy and its complication was most common in the age group 21- 35 years. This can be explained by the fact that most women conceive at this age.

Table 1: Age Distribution of Women under study

Age Group	Number of patient	Percentage
15-20	2	2%
21-25	12	12%
26-30	45	45%
31-35	19	19%
36-40	10	10%
41-44	12	12%

The adolescent age group less than 20 years accounted for 2 percent of patients. Their endometrium showed normal cyclical pattern. No endometrial lesion was observed in patients of this age group. 45% patients belonged to an age group 26 to 30 years.

Table 2: Showing stages of menstruation in women under study

SL.No	Stage of Menstruation cycle	Number of patient
1	Menstrual phase	12
2	Post menstrual phase/ Early proliferative phase	19
3	Late proliferative phase	11
4	Secretory phase	14

Transabdominal ultrasonography was used for endometrial assessment. Imaging showed normal endometrial pattern in 56 patients, 30 patients were in their proliferative phase with endometrial thickness ranging between 5 to 11 millimetres, 12 patients had thin endometrium ranging between 2-4mm and belonged to menstrual phase.

Table 3: Showing endometrial thickness during different phases of menstruation in different age groups during reproductive periods.

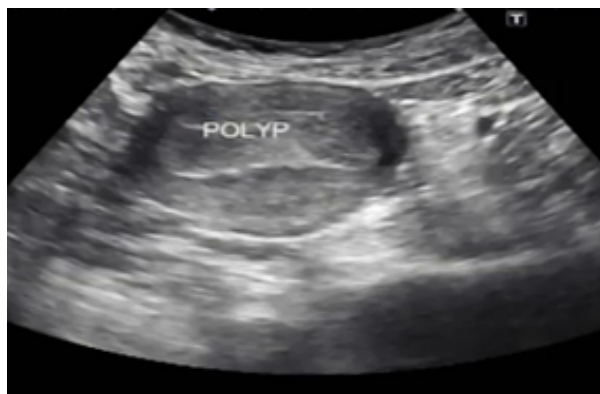
Age group	Total patients	Endometrial thickness	Phases of menstruation	Number of patients
15-20	2	2-4mm	Menstrual phase	1
		5-7mm	Early proliferative	1
		8-11mm	Late proferative	nil
		>11mm	Secretory phase	nil
			Pregnancy	nil
			Retained products of conception	nil
			Endometrial pathology	nil
21-25	12	2-4mm	Menstrual phase	4
		5-7mm	Early proliferative phase	nil
		8-11mm	Late proliferative phase	1
		>11mm	Secretory phase	5
			Pregnancy	1
			Retained products of conception	1

Table 4: Showing percentage of patients with normal and abnormal endometrial pattern.

Normal menstrual pattern	56%
Early pregnancy	19%
Retained products of conception	4%
Endometritis	12%
Uterine fibroid	8%
Endometrial polyp	1%
Atrophic endometritis	nil
Endometrial hyperplasia	nil

Maximum patients (56%) had normal menstrual pattern. Patients with early pregnancy were included in the study for evaluating the changes in the endometrium during pregnancy. 19% patients were diagnosed with early pregnancy while 4% patients had retained products of conception within endometrial cavity. Transabdominal ultrasonography

features suggestive of endometritis was observed in 12% of the patients. Puerperal endometritis was observed in 7 patients belonging to age group 26 to 30 years. Inadequate aseptic precautions, low socioeconomic strata and Emergency Caesarean section might be responsible for such higher incidence of endometritis in this age group.



Ultrasonographic image showing homogenous echogenic polypoidal lesion within the endometrial cavity suggestive of endometrial polyp.

Discussion

According to WHO, women of reproductive age refers to all women aged 15 to 44 years. The adolescent age

group < 20 years accounted for 2% of the cases. In this study, their endometrium showed normal cyclical pattern. No endometrial lesion was observed in patients of this age group. Patients with pregnancy and its complication were most common in the age group 21 to 30 years. This can be explained by the fact that most women conceive at this age. Patients with

early pregnancy were included in the study for evaluating the changes in endometrium during pregnancy. Women in reproductive age consult their gynaecologist mainly for antenatal check-up and complications of pregnancy followed by abnormal uterine bleeding and abnormal vaginal discharge. Transabdominal ultrasonographic is one of the modality through which diagnosis of intrauterine pregnancy, complications of pregnancy, assessment of endometrial thickness to diagnose endometrial pathologies like endometritis, uterine fibroid, endometrial polyp, Asherman syndrome (uterine synechia), endometrial hyperplasia and endometrial carcinoma can be diagnosed. [2,3] Chronic endometritis is a condition involving the breakdown of a peaceful coexistence between microorganisms and the host immune system in the endometrium. Hyun Jong Park et al [6] (2016) in his study has found the prevalence rate of chronic endometritis to be 10% in reproductive age. The incidence of postpartum endometritis in US varies depending upon the route of delivery and patient population. After vaginal delivery, incidence ranges from 13 to 90% depending on the risk factors present and whether perioperative antibiotic prophylaxis had been given. In the non-

obstetric population, concomitant endometritis may occur in upto 70 - 90% of documented cases of salpingitis. Puerperal endometritis is the most common postpartum infection. In patients without risk factors following normal spontaneous vaginal delivery, there is an incidence of 1 - 2%. Risk factors, however, can increase this rate to 5- 6%. Transabdominal Ultrasonography often helps to rule out other diagnosis in the postpartum patients with abdominal pain and fever. Such diagnosis include retained products of conception, infected hematoma and uterine abscesses. For patients with endometritis, findings consists of a thick and heterogeneous endometrium and intracavitary fluid. Some of these findings however, may be present as normal variants. Fuminori Kimura et al⁷ 2019, in his study found prevalence of chronic endometritis to be 2.8 to 56.8 % in infertile women, 14 to 67.5% in women with recurrent implantation failure and 9.3 to 67.6 % in women with recurrent pregnancy loss. In their study, overall incidence of chronic endometritis was found to be 8 % in women of reproductive age group. This large variance among studies is thought to be caused by the relativity small number of patients and differences in the diagnostic criteria applied.

Comparative study of incidence of endometritis

Authors	Year of Study	Incidence
Hyun jong park et al [6]	2016	10%
Fimunori Kimura et al [7]	2019	8%
Present study	2020	12%

In present study, ultrasonographic feature suggestive of endometritis consistent with symptoms found in 12% patients.

Comparative study of incidence of endometrial polyp

Author	Year	Incidence
Eva Driesler et al [8]	2008	7.8%
P.G.Anastasiadis et al [9]	2000	8.9%
Present study	2020	1%

In this study, ultrasonographic findings suggestive of uterine fibroid was observed in 8 patients, maximum cases observed in women aged more than 40 years. Lower incidence may be attributed to small study sample and preponderance of younger age group. Endometrial hyperplasia is characterised by disordered proliferation of endometrial glands. It results from the unopposed oestrogenic stimulation of the endometrial tissue with the relative deficiency of the counterbalancing effects of progesterone. The irregular growth of endometrium results in an abnormal glands to stroma ratio and presents in a continuum of the spectrum of changes in the endometrium. Endometrial hyperplasia has the propensity to develop into endometrial carcinoma. Endometrial malignancy is the most common gynaecological cancer in the United States. Study conducted on the epidemiology of endometrial hyperplasia reported that women who received the diagnosis of hyperplasia without atypia were in the range of 50 - 54 years. Hyperplasia with atypia was most commonly seen in the age group of 60 - 64 years

and the disease was quite rare below the age of thirty years. Susan D Reed and Katherine M. Newton et al [10] 2010 concluded that incidence of endometrial hyperplasia without and with atypia peaks in the early postmenopausal years and in the early 60s, respectively. No such aggressive endometrial lesion was observed in present study. Our result may be influenced by the selection process. The prevalence of aggressive lesions like endometrial polyps, endometrial hyperplasia and endometrial carcinoma increase with advancing age. The preponderance of younger women participating in our study may have led to lower estimate of the overall prevalence of aggressive endometrial pathologies.

Conclusion

This study showed that during reproductive age, most of the women have normal endometrial thickness depending upon their menstrual phase. 12% of the patients had endometritis. Inadequate aseptic precautions, low socioeconomic condition and emergency cesarean section might be responsible for

such higher incidence. Advanced endometrial lesions like endometrial hyperplasia, endometrial carcinoma were not found.

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