

CORRELATION OF CYCLICAL CHANGES IN ENDOMETRIUM AND UTERINE BLOOD FLOW WITH OVULATION, AND TO PREDICT THE APPROXIMATE TIME OF OVULATION

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Abstract

Background & Method: The study was carried out in the Department of Radio diagnosis, Index Medical College, Hospital & Research Centre, Indore with an aim to correlate of cyclical changes in endometrium and uterine blood flow with ovulation, and to predict the approximate time of ovulation.

Result: The study shows maximum numbers of cases (78%) have endometrial thickness more than 7 mm and most of them belongs to fertile group, while 22% cases have endometrial thickness less than 7mm and they all belong to infertile group. The study shows 66% of cases have 5 layered endometrial appearance and almost all of them were fertile and 34% cases have hazy 5 layered or no layering and most of them (14 out of 17) belongs to infertile group.

In this study 68% patients have multifocal endometrial blood supply and almost all of them are fertile while 32% patients have absent or sparse endometrial blood flow.

Conclusion: The advent of color flow imaging has enabled the detection of neovascularization and change in blood flow in endometrium and myometrium. In the study it was noted that 5 layered endometrium was present in almost all fertile cases while in infertile cases endometrium was single layer or hazy 5 layered, so it can be postulated that distinct 5 layered endometrium is associated with fruitful pregnancy outcome. It was also noted frequently in the study that endometrium thickness less than 7mm was commonly seen in infertile cases while patients having more than 7mm thick endometrium were from fertile group, so it can be postulated that good endometrial thickness provides more chances for fruitful pregnancy outcome.

Keywords: Endometrium, Uterine & Ovulation.

Introduction

Ovarian cycle-in human during fetal advancement the two ovaries contain more than 7 million early stage follicle. Anyway many go through atresia before birth and numerous other are lost after birth. At the hour of birth there are 2 million ova, however half of them are atretic. The million that are typical go through initial segment of first meiotic division at season of birth and enter a phase of capture in prophase where those that endure continue until adulthood(1). From birth to pubescence there are proceeding with atresia and number of ova in the two ovaries at the hour of adolescence is under 3 lakhs.

Each early stage follicle contains a youthful ovum. Toward the beginning of each cycle, a few follicles augment and a depression structures around the ovum (antrum development). This hole is loaded up with follicular liquid. In people one of the follicle in one ovary begin to develop quickly on around sixth day and turns into the prevailing follicle, while the others relapse, framing atretic follicles. The cells of the theca interna of follicle are the essential wellspring of flowing oestrogen. at about the fourteenth day of cycle the extended follicle break, and the ovum expelled into stomach cavity(2). This is the course of ovulation. The

ovum got by the fimbriated end of fallopian tubes. It is moved to uterus and except if preparation happens, on out through vagina.

The follicle that breaks at the hour of ovulation quickly loads up with blood and called as CORPUS HAEMORRHAGICUM. The granulosa and theca cells of the follicle lining speedily start to multiply and the coagulated blood is quickly supplanted with yellowish lipid rich luteal cells, shaping the CORPUS LUTEUM. This starts the luteal period of monthly cycle during which luteal cells insider facts estrogen and progesterone. On the off chance that pregnancy happens the corpus luteum persevere and in case there is no pregnancy corpus luteum start to decline and structures CORPUS ALBICANS(3).

Uterine cycle-the period starts from first day of feminine stage which normally continue up to fifth day of cycle after that proliferative stage begins, affected by estrogens from the Developing follicle, the endometrium increments quickly in thickness from the fifth to fourteenth day of cycle. It is additionally called the Preovulatory or follicular period of cycle. After ovulation the endometrium turns out to be all the

more profoundly vascularised and marginally edematous affected by estrogens and progesterone from corpus luteum. The uterine organs become snaked and convoluted and they start to emit clear liquid. Subsequently this period of cycle is known as the secretory or luteal phase (4).

Two kinds of courses supply the endometrium. The shallow 2/3rd of the endometrium that is shed during monthly cycle the layer functionale is provided by since a long time ago, wound twisting corridors while the profound layer that isn't shed the layer basale is provided by short, straight basilar veins. At the point when the corpus luteum relapse, hormonal help for endometrium is removed. The endometrium becomes more slender, which adds to the curling of winding veins. Foci of corruption show up in endometrium and these blend. There is also fit and afterward corruption of the mass of twisting veins, prompting patchy discharge that become blended and produce the feminine flow (5).

Material & Method

The study was carried out from June 2018 to July 2019 in the Department of Radio diagnosis, Index Medical College, Hospital & Research Centre, Indore, M.P. in close association of Department of Obstetrics & Gynecology includes total no. of 100 patients.

Criteria for selection of a case

1. The pt should have regular menstrual cycle.
2. Pt should be married because route of examination is transvaginal.
3. Patient must not be pregnant.
4. Pt should be well aware about date of last menstrual cycle.
5. Pt should be cooperative & well informed consent is necessary.

Probe preparation and insertion- The probe should be covered with a probe cover containing a small amount of gel. The gel ensures good contact between the transducer face and probe cover. Once the transducer has been covered, additional gel should be placed on the outside the sheathed tip. The patient, the nurse, or the radiologist may insert the probe. If radiologist inserts the probe, put the tip into the vaginal introitus and gently push posteriorly towards the rectum and against the pubococcygeus muscle while the pt is encouraged to relax.

Results

Table No. 1: Distribution of cases according to thickness of endometrium in mid cycle

S. No.	Thickness of endometrium	No. of cases	Percentage
1	<7mm	22	22%
2	7-9mm	06	6%
3	10-14mm	70	70%
4	>14mm	02	2%
Total		100	100

The study shows maximum numbers of cases (78%) have endometrial thickness more than 7 mm and most of them belongs to fertile group, while 22% cases have endometrial thickness less than 7mm and they all belong to infertile group.

Table No. 2: Distribution of cases according to endometrial layering in mid cycle

Endometrial layering	No. Of cases	Percentage
No layering	18	18%
Hazy 5 line appearance	16	16%
Distinct 5 line appearance	33	66%
Total	100	100

The study shows 66% of cases have 5 layered endometrial appearances and almost all of them were fertile and 34% cases have hazy 5 layered or no layering and most of them (14 out of 17) belongs to infertile group.

Table No. 3: Distribution of cases according to vascularity of endometrium during mid-cycle

Endometrial blood flow within zone 3	No. of cases	Percentage
Absent	18	18%
Present, but sparse	14	14%
Present multifocally	68	68%
Total	100	100

In this study 68% patients have multifocal endometrial blood supply and almost all of them are fertile while 32% patients have absent or sparse endometrial blood flow.

Discussion

In our study one thing observed that resistance index was lowest in periovulatory and early secretory period in normal fertile women. This thing can be proved by a previous study conducted by Salle B *et al* (1994)(6) with the objective of to study the uterine and ovarian perfusion during the menstrual cycle in normal fertile conditions. They studied 11 healthy volunteer women free of hormonal treatment by same operator with the same sonograph. Measurements are made in the uterine arteries and their branches. The resistance index of pourcelot (RI) was used as reference. The results shows uterine vascularization varied greatly during the menstrual cycle. Blood flow increased significantly in the periovulatory and early luteal phase in uterine arteries and their branches. While in Anovulatory cycle blood flow remained unchanged and arterial compliance remains stable. (7)

In this study endometrium shows cyclic changes, in proliferative phase the endometrium was thin and nonechogenic while in secretory phase it was thick and Echogenic. In our study endometrium was 4-12 mm in proliferative phase, and 6-14 mm in secretory phase. These parameters show resemblance to various previous studies (8).

In our study observed Resistance Index (RI) and Pulsatility Index (PI) values of uterine artery for different phases of menstrual cycle shows much similarity to previous studies conducted by various scientists.

Thus transvaginal sonography not only gives better morphological details and resolution but also in combination of color flow mode and pulsed Doppler, gives details about vascularity of endometrium, myometrium and ovaries that can help us in diagnosis and management of infertility and other pelvic diseases.

Conclusion

The advent of color flow imaging has enabled the detection of neovascularization and change in blood flow in endometrium and myometrium. In the study it was noted that 5 layered endometrium was present in almost all fertile cases while in infertile cases endometrium was single layer

or hazy 5 layered, so it can be postulated that distinct 5 layered endometrium is associated with fruitful pregnancy outcome. It was also noted frequently in the study that endometrium thickness less than 7mm was commonly seen in infertile cases while patients having more than 7mm thick endometrium were from fertile group, so it can be postulated that good endometrial thickness provides more chances for fruitful pregnancy outcome.

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