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ORIGINAL ARTICLE

Evaluation of Ultrasonography in Various Causes of Pelvic Pain in first Trimester of Pregnancy

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ABSTRACT

Background: Acute pelvic discomfort in pregnant and postpartum people can be difficult to diagnose and treat. Ultrasound is still the most common imaging modality used to evaluate pregnant and postpartum women.
Aim: To see how useful ultrasonography is in evaluating several causes of pain in pelvic during early pregnancy.
Methodology: A descriptive study was conducted at University of Lahore Teaching Hospital. Data of 344 participants were designated done suitable sample method. SPSS version 25 was used for data analysis.
Results: In this table, 344 patients with pelvic pain are reported; 108 (31.4%) patients had bleeding, 58(16.9%) had fibroids out of 344 patients, 60 (17.4%) had cyst and 19 (5.5%) patients had ectopic pregnancy, 236 patients were not count for bleeding status in which 223 (94.5%) patients had no ectopic pregnancy & 13 (5.5%) patients had ectopic pregnancy. 108 patients were count for bleeding status, in which 6 (5.6%) patients had ectopic pregnancy & 102 (94.4%) patients had not ectopic pregnancy, 236 patients were not count for bleeding status in which 235 (99.6%) patients had no fibroids & 1 (0.4%) patients had fibroids.
Conclusion: Fibroids and cysts were the most common findings in female with pain in pelvic in early pregnancy.
Key words: Pain inLower abdominal, early pregnancy, first trimester, fibroid, Gestational sac, crown lump length.

INTRODUCTION

Pelvic or lower abdominal pain in pregnant women during the first trimester is a common occurrence in emergency rooms, urgent care centers, and outpatient office practices. "Cramps" pelvic pain is typical in early pregnancy due to hormonal changes, rapid uterine growth, and increased blood flow[1]. This ache can be highly distressing for the primipara pregnant in the first trimester, women typically complain of pain. and sonographic results that are usual[2].

Lower abdomen pain that is cramping at first and then acute or stabbing afterwards. Unilateral bleeding is usually related with vaginal bleeding. Increase in pulse/heart rate, increase in respiration rate, extremity coldness, sweating, pallor and hypotension are all indicators of shock if the vessel is ruptured. [3] The patient could reveal history of amenorrhea that lasted approximately 6 to 10 weeks of pregnancy. Blood would be seen in abdomen after a paracentesis. In cases of severe abortions, such as septic or incomplete abortions, the patient would have severe pain in lower abdomen, heavy bleeding through vagina, increased temperature, and hypotension[4]. On pelvic examination, The uterus could be palpable suprapubically, and vaginal hemorrhage could be evident with or without visible conception products in the vaginal or cervical os[5].

Despite the "standard" second trimester ultrasound examination, which is widely used in many parts of the world for fetal anatomic assessment, first trimester ultrasound assessments are frequently used to detect early signs of pregnancy[1]. The reasons for a first trimester ultrasound vary, although they are usually connected to maternal complaints. Early in pregnancy, a typical intrauterine pregnancy is produced by a group of undifferentiated cells to an embryo or fetus inside gestational sac attached to wall of placenta and yolk sac. All this happens in period of 3 to 4 weeks. On ultrasound, the remarkable progression can be observed from a chorionic sac which is earliest indication of pregnancy in sonography, to fetus and cardiac activity. Interpreting and recognizing of the ultrasonic features for the safe first-trimester pregnancy.

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Chorionic cavity, commonly known as the amniotic sac, is first sonographical feature of early pregnancy. Because the amniotic sac is embedded in the endometrium, It is first observed in the decidua, slightly paracentrically, and is termed as the "intradecidual sac sign. "The fluid collection (blood) between the decidual layers should not be mistakened with gestational sac. The fluid accumulation in the decidua is termed as "pseudosac," mainly when an ectopic pregnancy is present. The gestational sac is first detected at around 4 weeks and can be seen on transvaginal ultrasound imaging a few days especially after the menstrual cycle is delayed. A gestational sac's first appearance on ultrasound may be difficult to see, but it grows rapidly at about 1mm every day. The gestational sac's edges are echogenic when it has a mean diameter of 2-4mm, making it easy to demonstrate. The gestational sac's echogenic ring is an essential ultrasonography marker for distinguishing GS from an accumulation of fluid and blood in uterine cavity. The amniotic sac has a rounded form at beginning, but as embryo and yolk sac develops, it becomes more oval. The arithmetic mean of the mean sac diameter (MSD) is determined by gestational sac's greatest sagittal, transverse, and coronal planes, and it can vary in size, growth, and shape. A MSD cutoff of ≥25 mm combined with the absence of a fetal pole is indicative of missed abortion. As a result, there is 100% specificity and 100% positive predictive value (or as close as possible). When the MSD is around 16 and 24 mm, the absence of an embryo is alarming but not diagnostic of a terminated pregnancy.The intradecidual sign is the earliest sonographic marker of early pregnancy. The endometrial line is deviated by a distinct hypoechoic fluid accumulation with an eccentrically positioned echogenic rim positioned in the cavity of endometrial[6]. At 4.5 to 5 weeks of pregnancy, this can be visible[7]. In 10% to 12% of clinically diagnosed pregnancies, spontaneous abortion occurs in the first trimester. Over the uterine or lower back, discomfort may be persistent or irregular, and cramps.[8] vaginal bleeding occurs in the majority of women who have spontaneous abortions. Up to 25% of bleeding occurs in all pregnant women at some point throughout their pregnancy, with probably miscarriage occurs in half them[9]. Molar pregnancy can result in pelvic pain because of the rapid change in uterine size, the development of related theca lutein cysts, or ovarian torsion brought on by the theca lutein cysts[10].

Multiple cystic areas represent hydropic villi in the characteristic sonographic look of a full mole; although, size of the villi and gestational age are directly related, and sonographic features are not seen in early molar pregnancies frequently.[11] Pelvic and abdominal pain, as well as amenorrhea, are signs of an ectopic pregnancy. There may be spotting or bleeding in the vaginal area. [12] Pain is the most common presenting symptom (97%), followed by vaginal bleeding (79%), with abdominal tenderness (91%) and adnexal soreness (79%) being the most common physical findings (54%). The best technique to diagnose an ectopic pregnancy is to use a combination of ultrasonography and hCG levels[13]. An increased occurrence of salpingitis and two possible factors include an increase in the use of assisted reproductive technology[14]. An adnexal lump is frequently seen on ultrasound, and Doppler investigations may reveal altered blood flow[15].

Because the ovaries receive blood from both the ovarian artery and the ovarian branch of the uterine artery, they have a dual blood supply. Doppler of ovarian torsion might be challenging.[16] The presence of venous flow indicates the viability of the ovary. The ultrasound is the primary imaging examination in the diagnostic evaluation of a pregnant patient. The uterus, ovaries, and other pelvic tissues are regularly evaluated using both trans-abdominal and endovaginally procedures[17].

Because of its noninvasive nature, safety, and dependability, ultrasonography is the preferred diagnostic approach for pregnant women with pelvic pain. Sonography can be used to diagnose both pelvic pain with or without pregnancy, such as a missed abortion, **Results:**In this table, 344 patients with pelvic pain are reported; 108(31.4%) patients had bleeding, 58(16.9%) had fibroids out of 344 patients, 60(17.4%) had cyst and 19(5.5%) patients had ectopic pregnancy, 236 patients were not count for bleeding status in which 223(94.5%) patients had no ectopic pregnancy & 13 (5.5%) patients had ectopic pregnancy.108 patients were count for bleeding status, in which 6 (5.6%) patients had ectopic pregnancy & 102(94.4%) patients had not ectopic pregnancy, 236 patients were not count for bleeding status in which 235(99.6%) patients had no fibroids & 1(0.4%) patients had fibroids. 108 patients were count for bleeding status, in which 57(52.8%) patients had fibroids & 51(47.2%) patients had no fibroids.

Table 1: In this table, out of 344 patients; 236(68.6%) patients had no bleeding and 108(31.4%) patients had bleeding, 286(83.1%) patients had no fibroids and 58(16.9%) had fibroids out of 344patients, out of 344 patients 284(82.6%) patients had no cyst and 60(17.4%) had cyst and 325(94.5%) patients had not ectopic pregnancy and 19(5.5%) patients had ectopic pregnancy.

Findings	Frequency and Percentage	
Age	27.99 + 7.419	
Bleeding	Yes	108 (31.4%)
	No	236 (68.6%)
	Total	344 (100.0%)
Fibroid	Yes	58 (83.1%)
	No	286 (16.9%)
	Total	344 (100.0%)
Cyst	Yes	60 (17.4%)
	No	284 (82.6%)
	Total	344 (100.0%)
Ectopic Pregnancy	Yes	19 (5.5%)
	No	325 (94.5%)
	Total	344 (100.0%)

Table 2: In this table, out of 344 patients; 236 patients were not count for bleeding status in which 223(94.5%) patients had not ectopic pregnancy & 13(5.5%) patients had ectopic pregnancy. 108 patients were count for bleeding status, in which 6(5.6%) patients had ectopic pregnancy & 102(94.4%) patients had not ectopic pregnancy

or threatening abortion, ruptured ectopic pregnancy, as well as pain that isn't related to pregnancy, such as nephrolithiasis or appendicitis. When ionising radiation should be kept to a minimal yet accurate imaging is required for advising treatment, ultrasound seems to be a suitable imaging modality for pregnant patients. We wish to determine whether pelvic pain in first-trimester pregnant women can be managed with ultrasonography as a primary imaging modality. Pelvic discomfort in pregnant and postpartum women can be difficult to diagnose and treat.

MATERIAL AND METHODS

In University Ultrasound Clinic Green Town, Lahore, Pakistan, a descriptive study was conducted. Data of 344 patients was collect in this study with convenient sampling technique. All the pregnant female having history of patient in early pregnancy were included in this study. Diabetic patients were also included. Uncooperative patients and asymptomatic patients were excluded. Data was collected according to the variables, i.e. the age, Ultrasound findings (Age, Bleeding, Gestational sac, CRL, FHR, HC, Fibroid, Molar pregnancy. Ultrasound machines of Mind ray Z5 and Toshiba Xario 100 with convex probe of 3-5 MHz were used and The technique of transabdominal scanning was used. Each patient's specific case record form contains records of all the above-mentioned factors (CRF). Data was gathered during the designated time. For data analysis, data organisation, and result compilation, the complete software SPSS version 2.4 has been applied.

Bleeding		Ectopic pregnancy		Total
		No	Yes	
No	Count	223	13	236
	% within Bleeding	94.5%	5.5%	100.0%
Yes	Count	102	6	108
	% within Bleeding	94.4%	5.6%	100.0%
Total	Count	325	19	344
	% Within Bleeding	94.5%	5.5%	100.0%

Table 3: In this table, out of 344 patients; 236 patients were not count for bleeding status in which 194(82.2%) patients had no cyst & 42 (17.8%) patients had cyst. 108 patients were count for bleeding status, in which 18(16.7%) patients had cyst & 90(83.3%) patients had no cyst.

Bleeding		Cyst		Total
		No	Yes	
No	Count	194	42	236
	% within Bleeding	82.2%	17.8%	100.0%
Yes	Count	90	18	108
	% within Bleeding	83.3%	16.7%	100.0%
Total	Count	284	60	344
	% within Bleeding	82.6%	17.4%	100.0%

Table 4: In this table, out of 344 patients; 236 patients were not count for bleeding status in which 235 (99.6%) patients had no fibroids & 1 (0.4%) patients had fibroids. 108 patients were count for bleeding status, in which 57 (52.8%) patients had fibroids & 51 (47.2%) patients had no fibroids.

Crosstab

Bleeding		Fibroids		Total
		No	Yes	
No	Count	235	1	236
	% within Bleeding	99.6%	0.4%	100.0%
Yes	Count	51	57	108
	% within Bleeding	47.2%	52.8%	100.0%
Total	Count	286	58	344
	% within Bleeding	83.1%	16.9%	100.0%

Chi square test .000

Table 5: In this table, out of 344 patients; 29 patients were count for corpus luteal cyst in which 20(69%) patients had no bleeding & 9 (31%) patients had bleeding, 24 patients were count for dermoid cyst in which 17(70.8%) patients had no bleeding & 7(29.2%)

patients had bleeding, 17 patients were count for ectopic pregnancy in which 12(70.6%) patients had no bleeding and 5(29.4%) patients had bleeding, 19 patients were count for intramural fibroids in which 19(100%) had bleeding, 229 patients were normal in which 186(81.2%) patients had no bleeding and 43(18.8%) patients had bleeding, 5 patients were count for submucosal fibroids in which 1 (20%) patient had no bleeding and 4(80%) patients had bleeding and 21 patients were count for subserosal fibroids in which 21(100%) patients had bleeding. Significant correlation found between bleeding and pelvic pain.

*Bleeding Crosstabulation		Bleeding		Total
Causes of Pelvic Pain		Yes	No	
Corpus luteal cyst	Count	20	9	29
	% within Diagnosis	69.0%	31.0%	100.0%
Dermoid Cyst	Count	17	7	24
	% within Diagnosis	70.8%	29.2%	100.0%
Ectopic pregnancy	Count	12	5	17
	% within Diagnosis	70.6%	29.4%	100.0%
Intramural Fibroid	Count	0	19	19
	% within Diagnosis	0.0%	100.0%	100.0%
Submucosal Fibroid	Count	1	4	5
	% within Diagnosis	20.0%	80.0%	100.0%
sub serosal fibroid	Count	0	21	21
	% within Diagnosis	0.0%	100.0%	100.0%
Total	Count	236	108	344
	% within Diagnosis	68.6%	31.4%	100.0%

Chi square test .000

Fig. 1: Single alive intrauterine gestation sac with mural uterine fibroid.

Fig 2: Simple right adnexal cyst with single alive intrauterine gestation sac

DISCUSSION

Our study was determination of evaluation of ultrasound in various causes of pain in pelvic during first trimester. On the basis of diagnosis of reasons of pain in pelvic in early pregnancy, ultrasound has become tool used for evaluation. In current study the attempt was made to determine role of ultrasonography Data were collected according to quantitative and qualitative variable i.e., the age, Ultrasound findings (Age, Pain, Bleeding, Gestational sac, CRL, FHR, HC, Fibroid, Molar pregnancy) patients of between 16- 44 years were included. Data of 344 patients were collected from The University of Lahore Teaching Hospital. Data were analyzed by SPSS version.

According to results of our study, out of 344 patients; 108(31.4%) patients had bleeding, 58(16.9%) patients had fibroids out of 344 patients, 60(17.4%) patients had cyst and 19(5.5%) patients had ectopic pregnancy. It is quite simple to learn how to diagnose sex during the first trimester.

Reem Hasan et al., 2010 characterized bleeding throughout the first trimester, excluding bleeding that happens during a miscarriage. Women between the ages of 18 and 45 were enrolled in the study (n=4539). Timing, heaviness, duration, colour, and related pain were all recorded, as well as the probability of recurrence in subsequent pregnancies. According to their findings, around a quarter of the individuals experienced bleeding, however only 8% experienced significant bleeding. Pain was associated with 28% of the spotting and mild bleeding events (n=1555). Pain was related with 54 percent of heavy occurrences (n=100). The majority of the sessions occurred less than three days between weeks 5 and 8 of pregnancy. Miscarriage occurred in 12% of women who had bleeding and 13% of those who did not. Fibroids and a previous miscarriage were two maternal features related to bleeding[18].

In another study, CharuChanana et al., 2017 studied the most common reason of vaginal bleeding in the first trimester was a normal early intrauterine pregnancy, although other possible reasons included spontaneous abortion and ectopic pregnancy. Ectopic pregnancy occurs in about 2% of all pregnancies and its one of the primary causes in maternal death globally. Ultrasound imaging was really useful. This photo essay highlights sonographic signs and common mistakes in ectopic pregnancy diagnosis[19].

Venkatesh A. Murugan et al., 2020 studied that patients presenting for a pregnancy For verifying the existence of an intrauterine gestation, assessing pregnancy survival, gestational duration, and multiplicity, diagnosing pregnancy-related issues, and identifying ectopic pregnancy in the first trimester, vaginal ultrasound is the best approach[20].

In their study, they analyzed the sonographic characteristics of a normal intrauterine pregnancy as well as the most common pregnancy disorders in the first trimester in the acute condition. In contrast to the findings of our study, 236 patients were not counted for bleeding status, with 223(94.5%) patients having no ectopic pregnancy and 13(5.5%) patients having ectopic pregnancy. There were 108 patients counted for bleeding status, with 6(5.6%) having an ectopic pregnancy and 102(94.4%) not having an ectopic pregnancy[21].

In another study, J. de Haan et al., 2015 studied. Adnexal masses are frequent throughout pregnancy. During pregnancy, ovarian cysts or masses should be accurately assessed to identify the patients. Ultrasound and magnetic resonance imaging (MRI) are both safe diagnostic methods for identifying benign and malignant lesions. Each patient's treatment options (surgical treatments) should be discussed individually[22].

According to the findings of our study, 29 patients had a corpus luteal cyst, of which 9(31%) had bleeding, 24 patients had a demoidcyst, of which 7(29.2%) had bleeding, 17 patients had an ectopic pregnancy, of which 5(29.4%) had bleeding, 19 patients had intramural fibroids, of which 19(100%) had bleeding, and 229 patients were normal, of which 43(18.8%) had bleeding ,Submucosal fibroids were counted in 5 patients, 4 of whom (80%) had bleeding, while subserosal fibroids were counted in 21 patients, all of whom (100%) had bleeding[23].

Giovanni DelliCarpini et al., 2019 looked the impact of fetal gender on the development of fibroids during pregnancy was studied based on -HCG serum levels found in another study. They discovered that 70 of the females had a female fetus and 87 had a male fetus. Prior to becoming pregnant to the second trimester, both fetal genders experienced a steady increase in fibroid

diameter. In the third trimester, male fetuses' means SD fibroid diameter increased while that of female fetuses' decreased. Especially throughout first pregnancy and after in the early and second trimester of pregnancy, women carrying female fetuses had larger fibroid diameters[24]. Women who were carrying a female fetus had greater HCG serum levels.There was a correlation among fibroid diameter and HCG levels in both female and male pregnancy.46 In contrast to the findings of our study, 236 patients were not counted for bleeding status, with 235 (99.6%) patients having no fibroids and 1 (0.4%) patient having fibroids. There were 108 patients counted for bleeding status, with 57 (52.8%) having fibroids and 51(47.2%) having no fibroids[25].

CONCLUSION

Fibroids and cysts were the most common findings in female with pain in pelvic in early pregnancy.

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