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# ULTRASONIC ASSESSMENT OF THE FIRST TRIMESTER VAGINAL BLEEDINGIN DUHOK CITY / KURDISTAN REGION OF IRAQ

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**ABSTRACT**

**First trimester vaginal bleeding has been considered as one of the commonest obstetrical and gynecological emergencies estimated in 20-25 % of all obstetrical emergencies all over the world. The aim of this study was the use of ultrasonic (US) imaging to identify the commonestcauses of first trimester vaginal bleeding , finding their incidence in primigravida and multigravida pregnant women , detecting the most frequent mean age of occurrence according to gestational age in weeks , looking for the incidence of viable and nonviable pregnancy among them , detecting their relations with a bad obstetrical history and finally estimating the disparity between clinical and ultrasonic diagnosis .**

**Patients and Methods: This study is a cross sectional study that has been done on one hundred thirteen pregnant women presented with vaginal bleeding in their first trimester of pregnancy, attending Azadi Teaching Hospital and Duhok Maternity Hospital from 1st June to 22th of November (2019 ). All patients were clinically referred byspecialized clinicians and subjected to ultrasound examination and examined under supervision of specialized radiologists.**

**Results: The mean age of the examined patients was29.4±5.9 years, multigravida were more than primigravida constituting (81.4%) of the cases compared with the primigravidawhich constituted (18.6%) of the cases , regarding the gestational age of these referred cases most of them were between 6-8 weeks of gestational Age (GA) with the mean 8.2±1.6 weeks. The prevalence ofnon-viable pregnancy constituting (67.3%) and the most common cause of vaginal bleeding was miscarriage (84.1%). The next frequent reason was ectopic pregnancy (6.2%) subsequently hydatiformmole (3.5%). The most common subtype of miscarriage was threatened miscarriage (32.7%). Among all the patients, thewhole difference between ultrasound diagnosis and medical diagnosis were found in 72 patients. Consequently, (63%) wasthe whole accurateness of clinical diagnosis while ultrasound accuracy was (100%).**

**Conclusion:**

**Ultrasound examination for the cases who are complaining from the first trimester vaginal bleeding ishelpful in confirming and detecting the different causes behind this bleeding,in addition to allow an early detection and more confident early obstetrical management with less subsequent complications.**

***KEYWORDS:*** *Ultrasonic, Pregnancy, Trimester, Vaginal bleeding, Gravida,*Diagnosis.

## INTRODUCTION

Vaginal Bleeding (VB) has been considered the commonest cause of emergency conditions in the first trimester of pregnancy , usually seen in the emergency departments of the maternity hospitals , accounting 20-25% of the emergency cases during this period of pregnancy in the world , therefore, early detection and proper diagnosis are essential for proper management , as it is also essential for diagnosing the mostcommon causes of natural miscarriage which take place around 15% globally in this trimester of pregnancy (Singh.K 2016, Gupta ,et al 2016).

Using ultrasound (US) imaging plays a major role in evaluation of first trimester VB as it is not accompanied by any reportable side effects with the use of proper suitable probes frequencies ,3-5 MHz transabdominal ultrasound (TAU) and 5-7 MHz transvaginal ultrasound (TVU). The accurate diagnosis of the viable or

non-viable pregnancy using ultrasound imaging prevents unnecessary prolonged hospitalization, hormonal treatment or unnecessary curettage to the patients. US guides obstetricians for accurate diagnosis of the cause behind early pregnancy bleeding, thereby, it helps appropriate treatment and avoids complications from misdiagnosis (Gupta et al 2016 ,YadavD et al 2015 )

About 50% of first Trimester bleeding lead to miscarriage; the primary causes of first are spontaneous abortions, ectopic pregnancies, and gestational trophoblastic diseases. The diagnosis is usually clinical, based on physical examination and clinical history and is confirmed by ultrasound. Endovaginal ultrasonography represented a significant enhancement of this technology decreasing maternal morbidity and mortality. Clinical history and pelvic examination are often inadequate in assessing the cause and the prognosis.

This study was undertaken mainly for the diagnosis of different causes of vaginal bleeding during the first trimester of pregnancy by using US equipment to find out the fallacy diagnosis based on clinical examination, aiming to find the discrepancy between clinical and ultra-sonographic diagnosis in addition to finding their percentage among multigravida and primogravida pregnant women , looking also for their obstetrical history to find out any associated relationship between them , it was also done to search for the incidence of viable and non viable pregnancy among them

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**Aims of the study:**

**1.** To assess the accuracy of US in diagnosing the causes of first trimester VB.

**2.** To define the causes of first trimester VB in relation to the mean gestational age of occurrence in weeks.

**3.** To determine the prevalence of viable and nonviable pregnancies among the study sample.

**4**. To find out any association between gravidity and the occurrence of VB.

## PATIENTS AND METHODS

This study is a hospital based cross sectional study thatwas carried out in Duhok maternity hospital and Azaditeaching hospital in Duhok city, in Iraq. The data was collected from beginning of June untilthe end of November .one hundred thirteen cases with first trimester vaginal bleeding ( FTVB) were enrolled in this research. The data were gathered using a feedback form questionnaire form ( available in the appendix I) , the patients were examined with ultrasound to discover and distinguish between actual pregnant and suspected pregnant women, and the pregnant women were exposed to Trans Abdominal Ultrasound **(TAU)**to assess the causes of the vaginal bleeding correlated with the clinical diagnosis , their mean gestational ages in weeks in addition to finding out the prevalence of viable pregnancy , the gravidity of patients and their previous obstetrical history ..

**Inclusion Criteria**

(ThobbiV et al 2016 )

**1.** Positive pregnancy test .

**2.** Observationofbleeding(fromsmallesttoserious flow).

**3.** Gravid patients ( primi/ ormultipara).

**4.** Patients aged 16 years upto 40 years.

**5.** Gestational age ranging from 6 - 13 weeks

**Exclusion Criteria**

There are several points that were considered in excluding certain cases according to (Farag, A, Ibrahim S, 2018 )

**1.** Non pregnant proved cases withVB.

**2.** Vaginal bleeding outside 6-13weeks.

**3.** Congenital uterineabnormalities.

**4.** Systemic causes of bleeding disorder.

**Ultrasound Machines: the following USmachines were used in the study**

**Philips** machine, probes: C5-2 MHz, L12-3 MHz, and E7-5 MHz SIEMENS machine, with same probes frequencies as above.

**Siemens** General Electric, GE VolusonEa, same probes frequencies as above.

**(a)** **(b)**

**Fig (1):-** Ultrasound machine and probe used in current study:
**(a)** SIEMENS machine **(b)** Probesused

**TRANSABDOMINAL ULTRASOUND (TAU)**

TAU scanning technique was used for the patients in supine position after distending urinary bladder , examined by using low frequency probe (3-5MHz). After the ultrasonic gel spreaded over the lower abdomen, measurements from the different angles of gestational sac, yolk sac, CRL and heart beat would be taken with the state of adnexa which would be finally recorded ((Farag, A, Ibrahim S, 2018 )

**Transvaginal ultrasound (TVU)**

TVU was conducted by high frequency probe (5-7MHz), with an empty UB to ensure good results, and the patients were examined in supine position with flexion state of both knees, the probe were covered to avoid sepsis, measurements from the different angles of gestational sac, yolk sac, CRL and heart beat would be taken ((Farag, A, Ibrahim S, 2018 ,KaurA 2011 )

**Data collection:**

This study is hospital based cross sectional study of women who were presented with VB for any duration in first trimester of pregnancy referred to the Radiology Department at Azadi Teaching Hospital and Duhok Maternity Hospital in Duhok City. The data was collected for a period of about 6 months (1st of June to 22thofNovember, 2018). A total of one hundred thirteen cases presented with the history of first trimester vaginal bleeding have been included in this study.

In order to access the evidence of the natural history the database was collected using a questionnaire forms (Appendix I). Then patients were subjected to ultrasound examination. All patients with bleeding were subjected to TAU under supervision by a radiologist. The TVU was preferred whenever abdominal ultrasound was equivocal or inconclusive, follow up done for all the patients and confirmed by ultrasound.

## RESULTS

**The study sample (in relation to age)**

The study sample was 113 patients. Patients (range 16-40 years, mean age was 29.4 ± SD 5.9)years ,the commonest age group presented with vaginal bleeding in the first trimester was 26-30 (N=37, 32.7 %). as shown in table1.

**Table (1):-** The study sample by their age

| Age (years) | No. | % |
|---|---|---|
| From 36 to 40 (G1) | 21 | 18.60% |
| From 31 to 35 (G2) | 25 | 22.10% |
| From 26 to30(G3) | 37 | 32.70% |
| From 21 to25(G4) | 24 | 21.20% |
| From 16 to 20 (GS) | 6 | 5.30% |
| *Total* | 113 | 100.00% |

**The study sample by Parity**

Parity were range 0- 10, mean parity for all the patients was 2.3 and ± SD 2, more than 81.4% (N=92) of the patients were multigravida and around 18.6% (N=21) were primigravida as shown in Table 2.

**Table (2):-** The study sample by miscarriage

| Status | Number | Percent |
|---|---|---|
| **Multigravida** | 92.00 | 81.40% |
| **Primigravida** | 21.00 | 18.60% |
| ***Total*** | 113.00 | 100.00% |

**The study sample by means of (gestation period)**

The range for all patients by period of gestation were 6-12 weeks, mean period 8.2 weeks, ±SD 1.6, most of the patients 55.8% (N=63) present between 6-8 weeks of gestational period, and least were present 9.7% (N=11) between 10-12 weeks as presented in table 3.

**Table (3):-** The study sample by means of (gestation period)

| Gestation period / week | Number | Percent |
|---|---|---|
| **10.10 - 1 2 .00** | 11 | 9.70% |
| **8.10-10.00** | 39 | 34.50% |
| **6.00 - 8.00** | 63 | 55.80% |
| ***Total*** | 113 | 100.00% |

**The study sample by means of (pregnant viability)**

The majority of patients were had Non-viable pregnancy 67.3% (N=76) and 32.7% (N=37) were viable as shown in table 4.

**Table (4):-** Patient's distribution by the viable pregnancy

| Pregnancy | Number | Percent |
|---|---|---|
| **Non-viable** | 76 | 67.30% |
| **Viable** | 37 | 32.70% |
| ***Total*** | 113 | 100.00% |

**The Study Sample by the Causes of Vaginal Bleeding**

The commonest causeof vaginalbleeding was miscarriage 84.1 % (N=95), followed by ectopic and unembryonic pregnancy (6.20%) and the least one was molar pregnancy 3.5 %( N=4), (figure 2 and table 5).

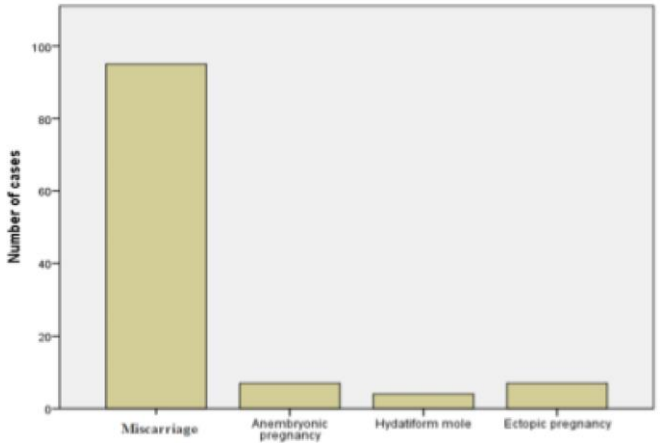



**Fig. (2):-** Main vaginal bleeding causes among the study patient**s**

**Table(5):-** The study sample of the causes of vaginal bleeding among the study patients

| Effect | Number | % |
|---|---|---|
| **Miscarriages** | 95 | **84.10%** |
| **Pregnant (Molar)** | 4 | 3.50% |
| **Pregnant (false, ectopic)** | 7 | 6.20% |
| **Pregnant (An-embryonic)** | 7 | 6.20% |
| ***Total*** | 113 | 100.00% |

**The study sample of Patients with miscarriages according to Ultrasound Findings**

Patients with threatened miscarriage are 37 with 32.70 % while the missed miscarriage are 31 with a 27.40% as revealed in figure 3and table 6.

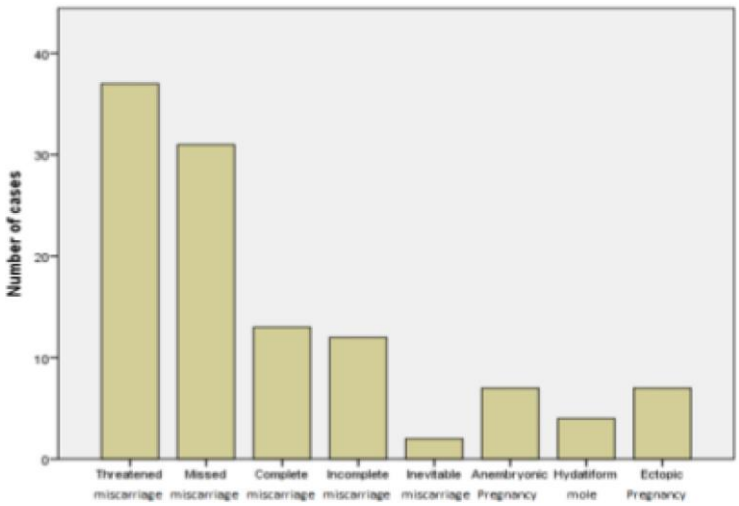



**Fig.( 3):-** Distribution of patients according to ultrasound findings

**Table ( 6):-** Patient's distribution by means of ultrasound results

| Ultrasound Findings | Numbe | Percent |
|---|---|---|
| **Miscarriage (Inevitable)** | 2 | 1.80% |
| **Miscarriage (threatened )** | 37 | 32.70% |
| **Miscarriage (missed)** | 31 | 27.40% |
| **Miscarriage (incomplete)** | 12 | 10.60% |
| **Miscarriage(complete)** | 13 | 11.50% |
| **Pregnant (molar)** | 4 | 3.50% |
| **Pregnant (an-embryonic)** | 7 | 6.20% |
| **Pregnant (ectopic)** | 7 | 6.20% |
| ***Total*** | 113 | 100.00% |

**Viability of Pregnancy according to Sub chorionic Hemorrhage**

The total number of patients with sub chorionic hemorrhage were 14 and out of them85.7% (N=12) were viable pregnancy and 14.3% (N=2) were non-viable pregnancy as shown in table7.

**Table** (7)**:** Viability of Pregnancy According to Sub chorionic Hemorrhage

| Viability of pregnancy | No. of Sub chorionic hemorrhage | **%** |
|---|---|---|
| - Non-viable | **2** | **14.30%** |
| **Viable** | 12 | 85.70% |
| ***Total*** | 14 | 100.00% |

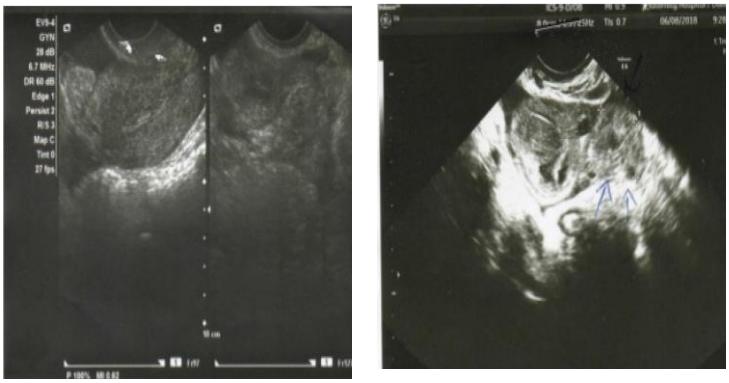
**Disparity Between Clinical and Ultrasound Final Diagnosis**

The disparity between clinical and ultrasonic diagnosiswas found in 72 out of 113 Patients, moreover, the sensitivity and specificity of clinical diagnosis is shown in table 8.

**Table(8):-**Inequality involving ultrasound and clinical diagnosis

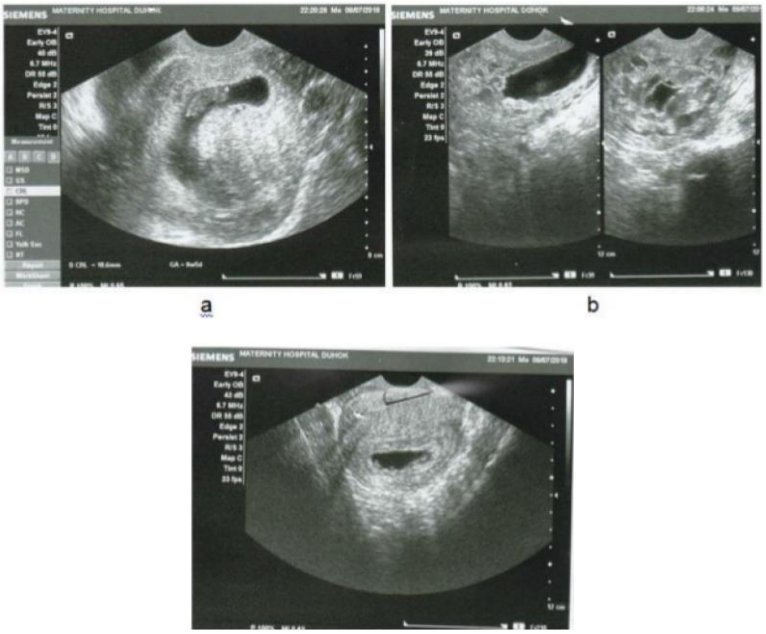
| **Cases** | **Clinical diagnosis** | **Ultrasound diagnosis** | **Disparity** | **Sensitivity % of clinical diagnosis** | **Specificity % of clinical diagnosis** |
|---|---|---|---|---|---|
| Miscarriage (Threatened) | 71 | 37 | 34 | 100.00% | 55.30% |
| Miscarriage (missed) | 15 | 31 | 16 | 48.40% | 100.00% |
| Miscarriage (complete) | 4 | 13 | 9 | 30.80% | 100.00% |
| Miscarriage (incomplete) | 14 | 12 | 2 | 100.00% | 98.00% |
| Miscarriage (Inevitable) | 1 | 2 | 1 | 50.00% | 100.00% |
| Pregnant (an-embryonic) | 0 | 7 | 7 | 0.00% | 100.00% |
| Pregnant (ectopic) | 7 | 7 | 0 | 100.00% | 100.00% |
| Pregnant (molar) | 1 | 4 | 3 | 25.00% | 100.00% |
| | 113 | 113 | 72 | | |

**Fig. (4,5, 6, 7):-**were carried out to our patients as shown below:



a b

**Fig. (4)**:- pregnant (ectopic), two pregnant women with VB and abdominal pain (a) 34 years and 8 weeks pregnant (b) 24 years and 7 weeks pregnant , in **a** showing free fluid in the cul de sac and endometrial reaction ,in **b** showing a non-homogeneous ill-defined left adnexial mass.



a b

C

**Fig.( 5)**: - miscarriage in three different patients , a)21 years old female present with VB, TVU shows fetal pole 7 weeks+1 day by CRL with negative fetal heart pulsation, (b) 25 years female, TAU shows pregnant 9 weeks+ 2 days by (MSD), irregular gestational sac and negative fetal heart pulsation, (c) 37 years female, TAU shows pregnant 8 weeks+5 days by MSD, GS small for gestationalage


**Fig.( 6):-**An embryonic pregnancy, 32 years old female present with, TVU shows 11 weeks + 5 days GA by MSD with no fetal pole.


**Fig.( 7)**:- Molar pregnancy, a female with 16 years old presents with hard VB. TAUshows GS 9 weeks+S days with multiple cyst-like appearance of variable sizes.

## DISCUSSION

The first trimester vaginal bleeding (FTVB ) frequent peak for the (26 to 30 years) of maternal age was ( 32.70% ), this finding was equivalent to research carried out in West Africa (Nigeria), in this cross sectional study done in 2019 the main patients ageswerefrom25to29yearswithafinding (33.70%)(AronuM et al 2018) ,Thisfindingsisconsideredtobe lower comparing with the study done by (KurmiD et al 2018 )which was ( 44% ) (for the same groupage)((KurmiD et al 2018 ))This could berelated to gestationinconsistencybecausethepresent one was carried out for 12 weeks age, while other studies were carried out for 14 weeks age.

Most of the patients were multigravida, (81.40% ) constitution, and (18.60% )primigravida, this was somewhat upper comparing to studies made in 2015 by((KurmiD et al 2018 and Kumar P et al 2017),theirmultigravida to primigravida values findings were (62.00%), and (70.00% )respectively in ((KurmiD et al 2018) , while the primigravida findings were (38.00%), and (30.00%) consequently in (Kumar P et al 2017)) . This could be related to culture in Duhokcity by which females got married early (in the teenage) which increase their fertilization.

The percent of the cases that has bleeding was (55.8%) their ages were between (6-8) weeks, while the studies done by ((KurmiD et al 2018 and Kumar P et al 2017, ThobbiV 2016) findings were(45.00%), (44 %)and(35.00%)respectively, thebleedingperiodfor6to 8weeks thatwas noticed could be because of the shift concept of luteal-placental shift , in early pregnant, progesterone usually produced and shifted by the corpus luteum, and shifted to placental production, this will result to trigger the VB precisely in early pregnancy ( EduwenD et al 2016 )

In the present research theviable pregnancy frequency was ( 32.70%), which match the findings of ( EduwenD et al 2016 ,Schauberger, C 2018.)which were (27.00%)and (37.00% ) correspondingly.

In the present work the main reason of FTVB was miscarriage 84.10%, nearly similar to the study conducted in united states in which miscarriage constitute (74%)Schauberger, C 2018., the

second common cause was ectopic pregnancy (6.2%) followed by hydatiformmole(3.5%),bycomparingthe current results withtheprevious studies of (KurmiD et al 2015 , 11 Kumar, P et al 2017 ,EduwenD et al 2016 ) which emphasized that miscarriage was with an incidence of (83%), (88.2) and (86%) subsequently, then followed by ectopic pregnancy (13%), (5.8%) and (10%). Finallyhydatiformmole wasreported (4%), (2.9%) and (4%) respectively.

The current research finding of threatened miscarriage constitute was( 32.70%), this findings match studies made by (Umar N et al 2014 , Sujatha S, et al 2016)their results constituted(30.20%) and (32.00%) respectively . However, these results in opposition to what was reported by a study done in 2016by (EduwenD et al 2016 ),this can be related to the easiness to access the patients to the hospital and the accessibility of facilities compared to the seeking of the therapeutic helps previous to pregnancy which becomes uncovered, while in Nigeria low socioeconomic state, low health education, under developed primary health care, and difficult reaching US center.

In the current study (87.20%)with current miscarriage had history of previous miscarriage (81.8%).Regarding the relation of miscarriage in current study with previous history of miscarriage wasn't major, maybe owing to the populace which were younger or equal to 21 years old, with small obstetric history. Sub chorionic hemorrhage was recognized in around 14 cases from the total 113 cases which show about (12.30%), while the finding of the study done in 2015 which was only (8.00%) which indicates the decrease in SCH compared with present work(Kumar, P.et al , 2017 ).

In the clinical diagnosis that correlates to ultrasound, the miscarriage threat was (62.70%), and (47.80%)was related to clinical fallacy, these findings match with the findings in 2015 that was reached by Gawade and Virmaniwhich was nearly to%( Gawade S, Virmani S.2015) Thewhole differenceamongtheclinicalandultrasounddiagnosis

were only 72 beyond 113 cases, which indicates a (63.00% )accuracy, this finding match with Gupta and his coworkers in 2016 by which their findings was( 64.00% )which is verynear to the findings of this study (Gupta N et al 2016 )

The ultrasound diagnosis of the ovarian was (13.20%) which elevated (2.00%) compared with the finding of Sujatha and Sujatha 2016; this elevation can be related collapsing and rupturing of cyst with ultrasound.

## CONCLUSIONS

**1.** Ultrasound showed almost accuracy of 100% in examining thecases and their causes of first trimester VB when correlated with proper clinical history and follow up.
**2.** Threatened miscarriage was the commonest cause of the bleeding followed by ectopic pregnancy and missed abortion, hydatiform mole was the least cause of this vaginal bleeding.
**3.** Regarding miscarriage, threatened type was the most commonly seen followed by missed abortion.
**4.** Muligravida are more commonly involved than primigravida.
**5.** The commonest gestational age of occurrence was 6-8 weeks.
**6.** The non viable pregnancy was more common among the patients.
**7.** Non significant relation was seen between the vaginal bleeding and the bad obstetrical history.
**8.** The current study revealed that theultrasound is very suitable to diagnose the possible pregnancy than other clinicaldiagnosis.
**9.** Ultrasound provides support in order to differentiate patients with threatened miscarriage from missed miscarriage and completes miscarriage, and prevents unnecessary hospitalization or curettage.
**10.** The results showed that ultrasoundcan help in localizationand detection ofcomplicationoflifethreateningectopicpregnancy.

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**Appendix I Questionnaire paper**

(Ultrasonic assessment of first trimester vaginal bleeding) IDNO: Name:

Age:

Date: / / .Ethnicity:Kurdish .Arabic .others ☐ ……. Gestationalage: …

weeks ☐ Days. ☐

Primi ☐ ultipara ☐ Bad obstetricalHistory: No ☐ .yes ☐

……

| **Clinical diagnosis……Provisional Diagnosis of Vaginal Bleeding** | **Ultrasound Findings** |
|---|---|
| 1- Threatened Miscarriage | UTERUS |
| 2-Missed miscarriage | |
| 3-Complete miscarriage | CERVIX |
| 4-Incomplete miscarriage | |
| 5-Inevitable miscarriage | OVARIES |
| 6-Anembryonic pregnancy (blighted ovum) | |
| 7-Hydatiform mole(H mole) | ADNEXA |
| *8-Ectopic pregnancy* | |

Confirmed By Dr. Maysaloon Shaman Saeed ……