**Scholars Journal of Applied Medical Sciences**
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

**Radiology**

# Contribution of Ultrasonography in the Etiological Diagnosis of First Trimester Bleeding at the Nianankoro Fomba Hospital of Segou, Mali

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**DOI:** 10.36347/sjams.2022.v10i10.006 | **Received:** 26.08.2022 | **Accepted:** 30.09.2022 | **Published:** 04.10.2022

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**Abstract** **Original Research Article**

Bleeding in early pregnancy is common. Approximately 20-25% of pregnant women may experience bleeding in early pregnancy. Half of the women who experience vaginal bleeding in the first trimester of pregnancy will carry their pregnancy to term. About 50% of first trimester bleeding will result in miscarriage. Given these factors, we evaluated the role of ultrasonography in the diagnosis of the first trimester bleeding. This prospective observational study took place from January 1 to December 31, 2019 at the ultrasonography unit of the Nianakoro Fomba Hospital of Segou. It involved pregnant women with first trimester bleeding who met the inclusion criteria of our study. Data were collected using a form and analyzed using EPIINFO version 7 software. The mean ± standard deviation of the age of the pregnant women was 26 ± 3.9 years with an age range of 15 to 43 years. On ultrasonography, out of 103 cases, 52.43% were abortions, 35.92% as threatened abortion and 8.74% as ectopic pregnancy. Ovarian detachment (29.13%) and interrupted pregnancy (22.33%) were the predominant ultrasonographic abnormalities. Ultrasonography remains an essential exam in the etiological diagnosis of first trimester bleeding.

**Keywords:** Bleeding, first trimester, pregnancy, ultrasonography.



## INTRODUCTION

Hemorrhage in the first trimester of pregnancy is bleeding of gynecological origin occurring in a pregnant woman before 14 weeks of ultrasonographic age (Deutchman *et al.*, 2009). Pregnancy is a major determinant of social status in Africa. It is sometimes known; otherwise, it should be systematically evoked in front of any delay in menstruation (amenorrhea), sympathetic signs of pregnancy and, if there is the slightest doubt, additional examinations (urinary ß-HCG dosage and ultrasonography) should be performed. First trimester hemorrhage is a frequent reason for consultation in gynecology and obstetrics departments and accounts for 20% to 30% of pregnancies in their early stages(Hendriks *et al.*, 2019). Of these bleeding pregnancies, about half stop spontaneously, while the others progress with a high risk of complications(Githinji IN., 2014). Hemorrhage in the first trimester of pregnancy requires special consideration and early and effective diagnosis. The diagnostic approach will make it possible to specify the location of the pregnancy (intrauterine or extrauterine), its evolution and the cause of the bleeding. The etiology will guide the therapeutic approach.

Maternal morbidity and mortality can be reduced by early diagnosis of first trimester bleeding. Life-threatening conditions, such as ectopic pregnancy, may present with minimal vaginal bleeding and, in the absence of obvious hemodynamic changes, the diagnosis may go undetected in the absence of ultrasonography(Dighe *et al.*, 2008).

Ultrasonography is necessary to determine the causes of bleeding and the severity of the disorder*(Chowdhury et al.*, 2019; Dighe *et al.*, 2008; Githinji IN., 2014). It can facilitate early diagnosis, appropriate decision making, and adequate management

of the causes of first trimester bleeding(Mahajan, 2019; Shah *et al*., 2019).

It should be noted that ultrasonography is the first and simplest of the noninvasive diagnostic tools but also the safest method of choice for the diagnosis of the causes of first-trimester bleeding.

Given these factors, we undertook this study to evaluate the role of ultrasonography in the diagnosis of first trimester bleeding in our daily practice.

## METHODOLOGY

This cross-sectional, descriptive, and prospective study took place at the Nianankoro Fomba Hospital of Segou in Mali, a second referral level public hospital. It was conducted over a 12-month period from January 1 to December 31, 2019. It involved women admitted to the radiology unit of the mentioned structure for ultrasoonography of the first trimester of pregnancy.

Were included in this study all pregnant women of ultrasonography gestational age less than or equal to 14 weeks of amenorrhea presenting metrorrhagia and having benefited from an obstetrical ultrasonography during the period of our study.

The following were not included:

Women who were not pregnant and who had received an ultrasonography for metrorrhagia, women in pregnancy of more than 14 weeks of ultrasonographic age, experiencing metrorrhagia and who had received an ultrasonography.

An history taking to collect clinical information and a routine general examination of the patient were performed. Trans-abdominal ultrasonography was performed in all cases after keeping the bladder full. The size and number of the gestational sac, yolk sac, fetal pole, fetal heart activity, presence or absence of hematoma or internal bleeding, and other associated parameters were noted. Transvaginal ultrasonography was used in cases where the results were inconclusive. Ultrasonography examinations were performed using SIEMENS ACCUSON X150 ultrasound scanners equipped with 3.5-MHz convex, 7.5-MHz linear, and 9.5-MHz endovaginal probes.

Data were collected with a form and analyzed with the Epi-INFO version 7 software.

All pregnant women were previously informed about the study and gave their free consent. No examination not necessary for the study was performed on the participants and all precautions were taken to avoid a delay in care. Anonymity and privacy were assured for the collected data.

## RESULTS

From January 1, 2019, to December 31, 2019, we found 103 cases of first-trimester pregnancy hemorrhage out of a total number of pregnancies of 1224, corresponding to a frequency of 8.41%.

The mean ± standard deviation of the age of all pregnant women was 26 ± 3.9 years and the range of minimum to maximum age was 15 to 43 years (Table 1).

**Table 1: Distribution of pregnant women by age**

| Age group in years | Percentage (%) |
|---|---|
| 15-35 | 73,78 |
| ≥36 | 26,22 |

More than one third (32.04%) of the pregnant women were paucigravida and 31.07% of the pregnant women were pauciparous (Table 2).

**Table 2: Distribution of pregnant women by gestational age, parity, and age of onset of bleeding during pregnancy**

| Variables | Percentage(%) |
|---|---|
| **Gestity** | |
| 1 | 30,09 |
| **2-3** | **32,04** |
| 4-5 | 27,18 |
| 6 et plus | 10,67 |
| **Parity** | |
| Nulliparous | 29,12 |
| Primiparous | 20,39 |
| **Pauciparous** | **31,07** |
| Multiparous | 16,5 |
| Large multiparous | 2,91 |
| **Age of pregnancy in weeks of amenorrhea** | |
| 4 – 6 | 18,44 |
| **7 – 10** | **69,90** |
| 11 – 14 | 11,64 |

Approximately 46% (45.63%) of the pregnant women consulted for metrorrhagia associated with pelvic pain (Table 3).

**Table 3: Distribution of pregnant women by ultrasonography purpose**

| Purpose of ultrasonography | Percentage (%) |
|---|---|
| Pelvic pain | 14,56 |
| Metrorrhagia | 36,89 |
| Metrorrhagia + pelvic pain | 45,63 |
| Prenatal visit | 2,91 |

In almost 70% (69.50) of the cases, the hemorrhage occurred between the 7th and 10th week of amenorrhea (Table 2). Abortion (n=54 or 52.43%) was the most frequent cause of hemorrhage in the first week of pregnancy, followed by threatened abortion (n=37 or 35.92%) (Table 4), regardless of occupation (Figure 1).

**Table 4: Distribution of pregnant women by etiology of bleeding**

| Etiology | Percentage (%) |
|---|---|
| Abortion | 52,43 |
| Ectopic Pregnancy (EP) | 8,74 |
| Molar pregnancy | 2,91 |
| Threatened abortion | 35,92 |

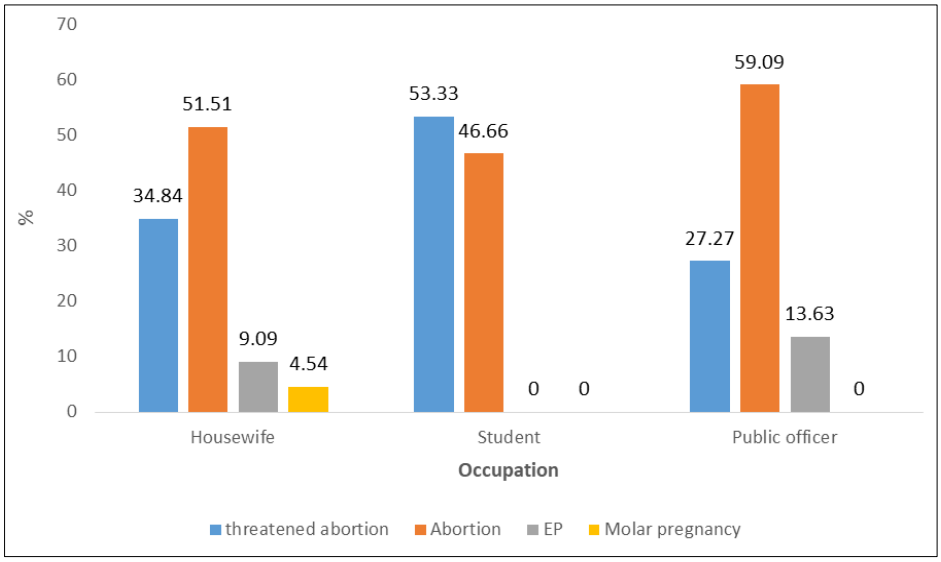


**Figure 1: Distribution of pregnant women by occupation and cause of bleeding**

Ovarian detachment (n=30 or 29.13) and interrupted pregnancy (n=24 or 23.30) were the most common ultrasonographic abnormalities found by the abdominal and endovaginal ways (Table 5 and 6).

**Table 5: Distribution of pregnant women according to the images found on endo-vaginal ultrasonography**

| Images visualized on endo-vaginal ultrasonography | Percentage (%) |
|---|---|
| Ovular detachment | 29,13 |
| Interrupted pregnancy | 23,30 |
| Retention of placental tissue | 17,48 |
| Empty uterus | 7,77 |
| Ruptured EP | 6,80 |
| Other* | 15,52 |

*** :** Clear egg (3.88%); Deformed sac (2.91%); Complete mole (1.94%); No abnormality (1.94%); Evolving unruptured EP (0.97%); No evolving unruptured EP (0.97%); Twin pregnancy (0.97%); Ovular sac > embryo size (0.97%), Incomplete mole (0.97%)

**Table 6: Distribution of pregnant women according to the images found on abdominal ultrasonography**

| Images visualized on abdominal way | Percentage (%) |
|---|---|
| Ovular detachment | 29,13 |
| Interrupted pregnancy | 22,33 |
| Retention of debris | 17,48 |
| Empty uterus | 7,77 |
| Ruptured EP | 4,85 |
| Other* | 18,44 |

*: Uncertain diagnosis (3.88%); Clear egg (3.88%); Complete mole (1.94%); Deformed sac (1.94%); Incomplete mole (0.97%); Ovular sac > embryo size (0.97%)

## DISCUSSION

The ultrasonography is a safe, valuable and non-invasive exam that has been used in the field of obstetrics for over 35 years. It is a very important technique for the examination of pregnant women and can be used if indicated, at any time during pregnancy. Human reproduction is a relatively inefficient process. Approximately 25% of all women may have one or more miscarriages.

In our study the prevalence of first trimester bleeding during pregnancy was 8.41%. This prevalence is comparable to those of Kané B. (Kane B., 2011) and Coulibaly Y. (Coulibaly Y., 2010) who found 9.20% and 8.62% respectively.

### Socio-Demographic Characteristics

### Age

First trimester bleeding occurs at any age during the genital period, but is more prevalent in young pregnant women. Thus, the most represented age group was 15 to 35 years with 73.79%. This result is comparable to those of Bahij Y.(Bahij Y., 2016) who found a high frequency of 80% between 20 and 35 years and Camara L.(Camara L., 2018) who found a percentage of 84% between 18 and 35.

### Occupation

In our study, first trimester metrorrhagia was more frequent among housewives (64.08%). Our results are close to those of Kané B. (Kane B., 2011) with 66.10%, but different from those of Sidibé MD. (Sidibé MD., 2006) and Dembélé SA.(Dembele SA., 2010) who found respectively 51 and 47.86%.

This high frequency among housewives can be explained by incessant and sometimes arduous housework that leads to disruptions in early pregnancy. In addition, their socio-economic status, for the most part unlettered and with little income, limits their attendance at health centers.

Our study revealed that metrorrhagia was more frequent among poor women (31.07%), nulliparous women (29.12%) and primiparous women (20.39%). These results are similar to those of Coulibaly Y. (Coulibaly Y., 2010) who found 45.5% of pauciparous women, 24.5% of nulliparous women and 11.8% of primiparous women Koné ID. (Koné ID., 2015) found 33.1% in pauciparous women, 30.5% in multiparous women, 25.4% in nulliparous women and 11% in primiparous women, while Mangenzi PM. (Mangenzi PM., 2014) revealed in his series that nulliparous women are the most affected by first trimester hemorrhage with a proportion of 39.1%.

### Ultrasonography Findings

The etiology of these first trimester hemorrhages was dominated by abortions (complete and incomplete) and threatened abortions which were respectively 52.43% and 35.92%. These rates are similar to those of Shah K *et al.,* (Shah *et al.,* 2019) who found 23.3% abortions, 71.1% threatened abortions and Chowdhury S *et al.,* (Chowdhury *et al.,* 2019) who found 47.56% abortions and 28.75% threatened abortions.

This proportion could be explained by the fact that pregnant women are more prone to abortions when they are primigravida or paucigravida and do not have useful information on the normal course of the pregnancy.

Regarding EPs we recorded 8.7% cases, which is higher than Kumar P. *et al.,* (Kumar *et al.,* 2017) 4% in India and close to Chowdhury S. *et al.,* (Chowdhury *et al.,* 2019) 8% in Bangladesh.

This could be explained by the existence of genital infection recognized in the literature as a major risk factor for EP. It should be noted that in 77.78% of cases, the EPs were ruptured. This may be the consequence of a delay in consultation in case of abnormal symptoms from the beginning of the pregnancy, but also because of the difficulties that non-specialized health personnel have in diagnosing EP.

Molar pregnancy represented 2.91% of the cases. Complete moles accounted for 66.67% of all moles. This result is comparable to that of Traoré A. (Traoré A., 2001) who found 2.57% of moles and higher than those of Cissé *et al.,* (Cissé *et al.,* 2003) at the Dakar University Teaching Hospital who found 0.5% of moles. However, in 1.94% of cases, ultrasonography did not detect any probable cause of

hemorrhage. This finding is lower than that made by Dembélé SA. (Dembele SA., 2010) with 42.8%.

The abdominal and endovaginal examinations were systematically carried out in all patients and a comparative study showed that in 3.88% the abdominal examination was unable to confirm the diagnosis (uncertain diagnosis) whereas the endovaginal examination validated all the examinations carried out, these results reinforce the literature on the importance of the endovaginal examination as a systematic complement to all the gynaecological examinations (Cullen *et al.,* 1989; Kaur & Kaur, 2011).

## APPENDIXES

**Observation n° 1:** BS, 40 years old is received in the department on 25/11/2019 for metrorrhagia associated with pelvic pain on a pregnancy of about 2 months.

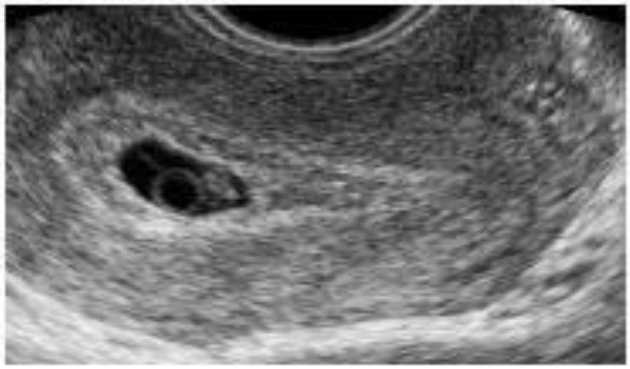

**Figure 2: Pregnancy terminated at 6 weeks of amenorrhea**

Endo-cavitary ultrasonography shows us a hypotonic gestational sac, with a large umbilical vesicle and a 6 mm embryo without cardiac activity.

**Observation n° 2:** C K. 18 years old received at the service for metrorrhagia and pelvic pain on 10/12/2019 on about 3 months amenorrhea.

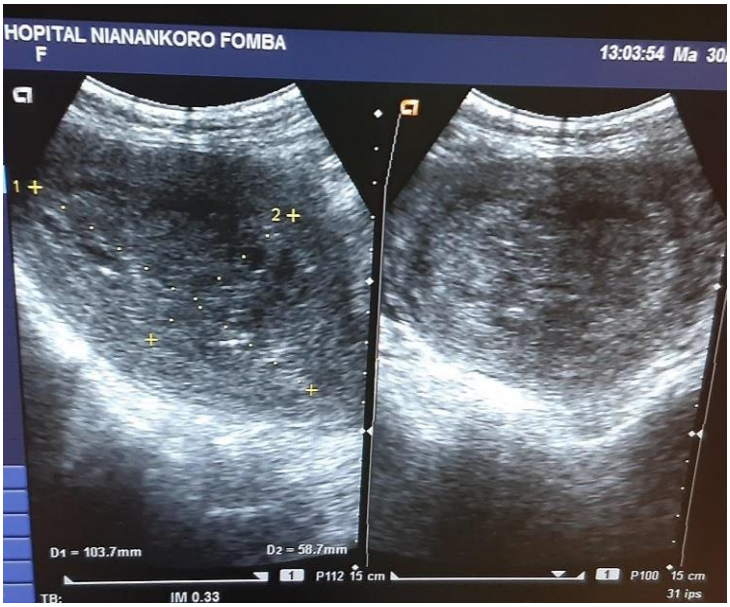


**Figure 3: Trophoblastic retention**

Abdominal ultrasonography shows the uterine cavity distended by numerous, heterogeneous echoes corresponding to trophoblast, decidua and blood clots.

**Observations n° 3:** BO. received at the service on 03/07/2019 for metrorrhagia on 3 months amenorrhea.


**Figure 4: clear egg**

Endo-cavitary ultrasonography shows us a gestational sac measuring 32 mm in diameter, containing no embryo, nor umbilical vesicle.

**Observation n° 4:** DM. received at the service on 04/03/2019 for metrorrhagia in a context of fall of her height.


**Figure 5: Progressive pregnancy of 7 weeks of amenorrhea**

Endo-cavitary ultrasonography showed a peri ovular hematoma (arrow) of 22x7 mm, the umbilical vesicle and the embryo are present.

**Observation n° 5:** KM. received at the service on 12/05/2019 for pelvic pain + metrorrhagia for one month delay.

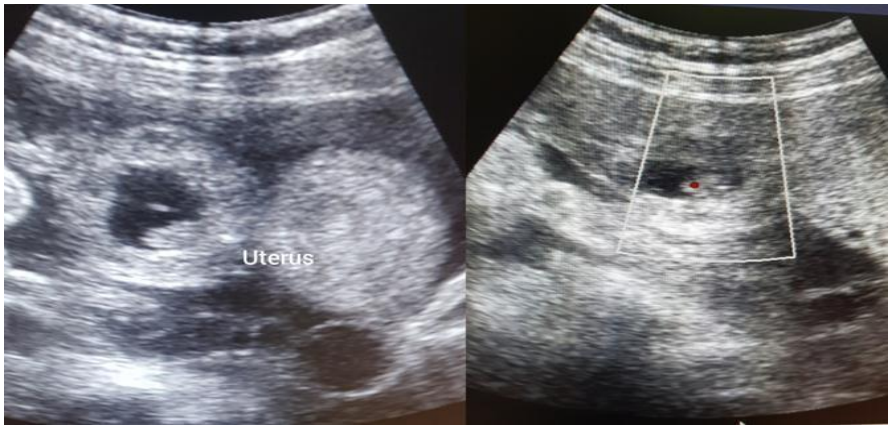


**Figure 6: Ectopic pregnancy**

Abdominal ultrasonography examination shows an ovarian sac containing an embryo with cardiac activity at the right latero-uterine location associated with a liquid effusion in the hypogastrium.

## CONCLUSION

First trimester Bleeding is a common obstetric problem and a source of anxiety and concern for both the patient and the practitioner.

History taking and clinical examination are not effective in assessing cause and prognosis. Common causes of bleeding in the first trimester are abortion, ectopic pregnancy, and molar pregnancy. Ultrasonography is a non-invasive, non-ionizing, and readily available method for determining the actual causes of bleeding to guide the clinician in making the appropriate therapeutic decision, thereby avoiding poor and/or delayed management of the pregnant women.

**FUNDING**

None.

**CONFLICT OF INTEREST**

None.

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