

Ultrasound Causes of Female Infertility at the Fertilia Medical Clinic in Bamako

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Abstract

Aims: Infertility is a major problem in our current societies and the Fertilia medical clinic in Bamako is a center for medical assistance in procreation (MAP) where there is an increasingly growing demand for ultrasound. The objective of our study was to investigate the ultrasound causes likely to prevent the occurrence of pregnancy in a group of infertile and subfertile women. **Subjects and Methods:** This was a 5-year cross-sectional and prospective study, between January 2017 and January 2022, which involved 250 women wishing to become pregnant (infertile or subfertile), who came for pelvic ultrasound or follicular monitoring and who agreed to participate in our study. The parameters used were ultrasound reports including uterine, ovarian and tubal pathologies. It should be noted that in some cases no ultrasound cause of infertility was found. Data were entered and analyzed in SPSS. **Results:** 250 women were recruited into our. The average age was 32 years with extremes ranging from 17 to 51 years. 179 patients or 71.6% were between 17 and 35 years old. 139 patients or 55.6% had secondary infertility against 44.4% primary infertility. 202 patients or 80.8% had at least one ultrasound lesion and 48 patients or 19.2% had no significant ultrasound abnormality. The most represented ultrasound lesions were of uterine origin with 72.20%, 23.7% ovarian lesions and 04% tubal lesions. Uterine lesions were dominated by myomas, adenomyosis, endometrial polyps, uterine malformations and synechiae. As for ovarian lesions we noted cysts, polycystic ovary syndrome (PCOS), ovarian endometriosis, non-follicular ovaries and tubal ultrasound lesions showed unilateral or bilateral hydrosalpinx. **Conclusion:** In our study, ultrasound was an invaluable contribution to the diagnosis of the causes likely

to explain subfertility and infertility in our respondents. She highlighted uterine, ovarian and tubal lesions, some of which could be corrected and pregnancies ensued.

Keywords

Ultrasound, Female Infertility, Myomas, Polycystic Ovaries, Hydrosalpinx

1. Introduction

According to the World Health Organization (WHO), infertility is defined as the absence of conception after at least 12 months of normal, regular, complete and unprotected sexual intercourse [1]. It affects around 180 million people worldwide and around one in six couples face primary or secondary infertility [1] [2]. The rate of infertility varies from one country to another, ranging from 5% to 8% in developed countries and from 5.8% to 44.2% in developing countries [3].

The woman is still considered the main culprit of marital infertility. Many women remain marginalized, even repudiated because of this confusion linked to ignorance of the etio-pathogenic data of marital infertility. It is a social drama experienced mainly by women in the African environment who are the first to be questioned [4]. The most effective imaging techniques in female infertility are endoscopy (hysteroscopy and laparoscopy) and MRI. Conventional imaging methods such as hysterosalpingography (HSG), and transvaginal ultrasound (ETV) are classified as screening examinations [5]. But in black Africa, MRI is not widely available and expensive. ETV and HSG remain the only feasible means of imaging during the exploration of female infertility. [6]. The aim of our study was to show the role of this accessible and available imaging tool in the assessment of female infertility in a low-income country like Mali. Few studies have been carried out in our country on this subject, so our study will serve to shed light on many people on female infertility given the interest of the subject. Internationally many studies have been done on female infertility but they are full of some shortcomings that we have tried to fill in our study.

2. Materials and Method

This was a 5-year cross-sectional and prospective study, between January 2017 and January 2022, which involved 250 women wishing to become pregnant (infertile or subfertile), who came for pelvic ultrasound or follicular monitoring and who agreed to participate in our study. We gave ourselves a study duration of 5 years and all the patients who presented for ultrasound in a context of primary or secondary infertility at the time of our study and who agreed to participate in our study constituted the size of our sample, *i.e.* 250 patients. The parameters used were ultrasound reports including uterine, ovarian and tubal pathologies. It should be noted that in some cases no ultrasound cause of infertility

was found. Data were entered and analyzed in SPSS.

2.1. Exploration Techniques

We used different types of ultrasound machines such as Voluson E8, Logic9 and Vivid3. The pelvic ultrasound was done in 95% of cases by the endovaginal route and generally on the second day of menstruation for cases of medically assisted procreation and randomly for other cases.

2.2. Data Processing and Analysis

The data collected on the technical sheets were entered and analyzed using SPSS software. Spearman's and Pearson's correlation tests were used to determine the degree of significance during comparisons at the 5% level.

3. Results

250 women were recruited into our study. The average age was 32 years with extremes ranging from 17 to 51 years. 179 patients or 71.6% were between 17 and 35 years old. 139 patients or 55.6% had secondary infertility against 44.4% primary infertility. 202 patients or 80.8% had at least one ultrasound lesion and 48 patients or 19.2% had no significant ultrasound abnormality. (**Table 1**) The most represented ultrasound lesions were of uterine origin with 72.20%, 23.7% ovarian lesions and 04% tubal lesions. (**Table 2**) Uterine lesions were dominated by myomas, adenomyosis, endometrial polyps, uterine malformations and synchiae. (**Table 3**) As for ovarian lesions we noted cysts, polycystic ovary syndrome (PCOS), ovarian endometriosis, non-follicular ovaries and tubal ultrasound lesions showed unilateral or bilateral hydrosalpinx. (**Table 4**)

202 patients or 80.8% had at least one ultrasound lesion and 48 patients or 19.2% had no significant ultrasound abnormality.

Uterine ultrasound lesions dominated with 72.20% of cases.

Table 1. Distribution of patients according to the presence of echographic anomaly.

Ultrasound Lesions	Number	Percentage (%)
YES	202	80.80
NO	48	19.20
TOTAL	250	100%

Table 2. Distribution of patients according to the origin of the ultrasound lesion.

ULTRASOUND LESION LOCALISATION	NUMBER	PERCENTAGE (%)
UTERINE	146	72.20
OVARIAN	48	23.70
TUBAL	8	4
TOTAL	202	100%

Table 3. Distribution of patients by type of uterine abnormality.

Ultrasound Abdnormality	Number	Percentage (%)
SINGLE MYOMA	28	19.17
MULTIPLE MYOMAS	85	58.21
ADENOMYOSIS	26	17.80
ENDOMETRIAL POLYP	5	3.42
UTERINE MALFORMATION	1	0.68
SYNECHIA	1	0.68
TOTAL	146	100%

Table 4. Distribution of patients by type of ovarian anomaly.

Ultrasound Abnormality	Number	Percentage (%)
SINGLE FUNCTIONAL CYST	8	16.66
BILATERAL FUNTIONAL CYST	5	10.41
POLYCYSTIC OVARIAN SYNDROME	29	60.41
ORGANIC CYST	1	02.08
OVARIAN ENDOMETRIOSIS	3	06.25
NON-FOLLICULAR OVARIES	2	04.16
TOTAL	48	100%

The polymyomatous uterus was the most represented on the ultrasound, 58.21%, and almost all of these myomas were submucosal. Uterine myomatosis accounted for more than 77% of all uterine lesions observed, followed by adenomyosis.

Polycystic ovary syndrome (PCOS) was the most represented ovarian ultrasound anomaly with just over 60%. In some cases, there were more than twenty follicles per ovary with cycle disorders, hirsutism and a deep voice, witness to a fairly pronounced androgenism.

Tubal abnormalities were hydrosalpinx, 8 patients or 04%. Of the 8 patients, 5 had bilateral hydrosalpinx and 3 had unilateral hydrosalpinx.

4. Discussion

250 women were recruited into our study. The average age was 32 years with extremes ranging from 17 to 51 years. 179 patients or 71.6% were between 17 and 35 years old. This result is similar to that of Tientore K. *et al.* [7] who found 63.64% of subfertile women in Ouagadougou in 2016.

139 patients or 55.6% had secondary infertility against 44.4% primary infertility. This score is similar to that of Dembélé N. [8] who in 2021 had found 55.70% secondary infertility versus 44.30% primary infertility.

In our study, ultrasound found abnormalities in 80.8% of respondents. Several

authors have reported similar figures [9] [10] [11]. This could be explained by the fact that ultrasound is the first-line examination in the infertility assessment.

72.20% of ultrasound abnormalities were of uterine origin. This score is above that of Shalev J. [12] who found 50.3% uterine causes and different from that of Tiemtore K. *et al.* [7] who found 67% lesions of rather ovarian origin.

Myomas accounted for more than 77% of all causes of uterine origin. This figure is very close to that found by Gandji *et al.* [13] who found 76.8% of causes of infertility linked to myomas, especially submucosal.

Polycystic ovary syndrome (PCOS) is the most represented ovarian ultrasound anomaly with 60.41%. Biao *et al.* [14] reported similar results in their series in 2008 (61%). Many other authors have reported that the main etiology of infertility is related to an ovulation abnormality such as polycystic ovary syndrome (PCOS). [15] [16] [17] [18]. (Figure 1)

Tubal lesions were represented by hydrosalpinxes. They were not very representative in our study (04%). Camus E *et al.* [19] reported 06% of cases of hydrosalpinx and determined its role in *in vitro* fertilization (IVF) failures and reduction in the rate of natural and induced pregnancies. (Figure 2 & Figure 3)

Limits of the Study

Since this is a prospective study, the frequency of female infertility would be underestimated in Bamako but also the causal diagnosis as well made difficult because of meager means paraclinical exploration.

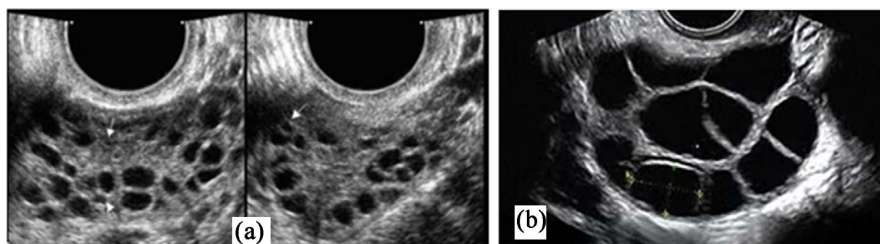


Figure 1. (a) Pelvic ultrasound by vaginal route on the 3rd day of menstruation with more than 16 follicles per ovary; (b) Polyfollicular ovary on the 8th day of stimulation: High risk of ovarian hyperstimulation.

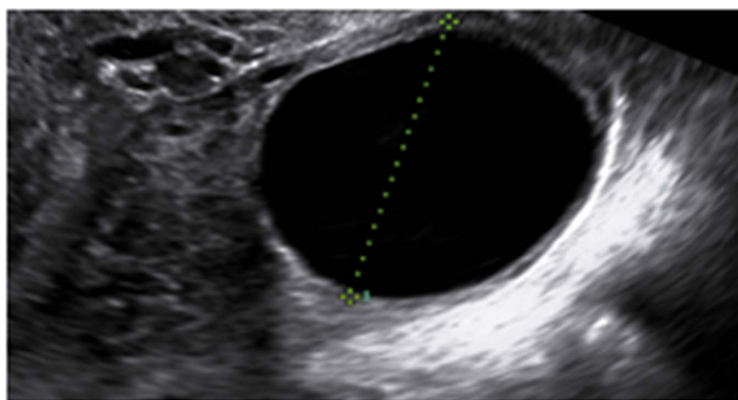


Figure 2. Functional ovarian cyst.

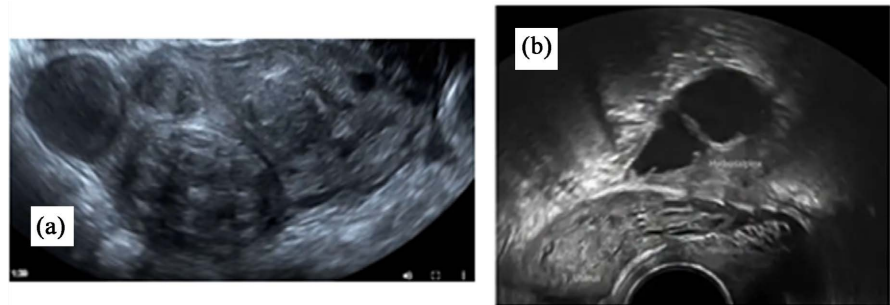


Figure 3. (a) Polymyomatous uterus with nuclei compressing the cavity line; (b) Left hydrosalpinx.

5. Conclusion

Ultrasound in the assessment of female infertility in our context has been really contributory because it has made it possible to diagnose uterine pathologies mostly resolved by polomyomectomy, ovarian pathologies marked by dysovulation treated by ovulation inducers and ovarian and finally tubal monitoring.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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