

Practice of Pelvic Ultrasound in Women with Fertility Problems at Notre Dame Des Apôtres Hospital in N'Djamena, Chad

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Abstract: Infertility is a concern for couples and families in Africa. The aim of this study is to improve the care of women with female infertility in Chad. This is a descriptive cross-sectional study. It involved 70 women who came to the Notre Dame des Apôtres Hospital in N'Djamena over a period of four months from June to October 2023 for pelvic ultrasounds as part of infertility investigations. Data collection required questionnaires that gathered information on the sociodemographic characteristics of these women on the one hand, and the results of the various examinations performed on the other hand. The average age of the women is 29. The clinical profile was dominated by pelvic pain (13%), primary infertility (26%), secondary infertility (46%), recurrent miscarriage (7%), and amenorrhea not related to pregnancy (6%). The lesions observed were dominated by pathologies that, in most cases, were the sequelae of untreated or poorly treated infections.

Keywords: Female Infertility Etiology, Pelvic Ultrasound.

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I. INTRODUCTION

According to the WHO, infertility is a condition of the male or female reproductive system defined by the inability to achieve pregnancy after 12 or more months of regular unprotected sexual intercourse; it affects millions of people of reproductive age worldwide and has an impact on their families and communities; it is estimated that between 48 million couples and 186 million people are affected by infertility worldwide; in women, infertility can be caused by a range of abnormalities of the ovaries, uterus, fallopian tubes, and endocrine system, among others [1].

Across Europe, the incidence of infertility is almost 15%; according to a 2013 study, approximately 25 million Europeans suffer from infertility. Advancing age at the time of wanting to have children is one of the main factors contributing to infertility in women and, to a lesser extent, in men, along with sexually transmitted diseases, hormonal, genetic, and environmental factors, and lifestyle factors [2].

In France, approximately one in eight couples seek medical advice due to difficulties conceiving a child; in three-quarters of cases, infertility is caused by male or female factors, or a combination of both; in 10 to 25% of cases, it cannot be attributed to a specific defect in either partner [3].

In Africa, infertility rates are the highest in the world, with between 15% and 30% of couples affected, compared to 5% to 10% in Europe [4].

In Côte d'Ivoire, the prevalence of infertility was 14.03%; the average age was 34.31 years for women and 43.2 years for men. The majority of patients had attained at least a high school education (77.1%). Couples residing outside Abidjan accounted for 15%, and infertility affected all socioeconomic groups. The average length of time couples lived together was 6.9 years, with an average infertility period of 6.3 years [5].

In Cameroon, 20 to 30% of couples suffer from infertility, with prevalence varying from region to region. Secondary infertility (60.6%) and primary infertility (39.4%) were found in this study. The duration of infertility was 1–3 years (52%), 4–6 years (24%), and more than 7 years (24%); the average duration of infertility was 4.70 years \pm 3.58, with a minimum of one year and a maximum of 19 years; The causes of infertility found in women were tubal-peritoneal (48.9%), uterine (6.5%), and ovarian (7.6%); in men, spermatogenesis disorders characterized by oligoasthenozoospermia were found in (66.6%) [6].

In Chad, the prevalence of infertility was 14%; this infertility was predominantly secondary (61%); the majority of couples in this series had been infertile for one to three years (67.9%); the most affected age groups were those aged 30 to 34, with an average age of 28.9 \pm 6.1 for women, and those aged 40 and over, 30 to 34, and 25 to 29, with an average age of 34.1 \pm 6.7 for men; Marital status was dominated by monogamous individuals (60.7%); infertility was female in 42% of cases, male in 30% of cases, and mixed in 28% of cases [7].

Since infertility treatment is multidisciplinary, medical imaging is an essential step in the current century because it plays a role in confirming diagnoses, determining etiology, and indicating treatment. Among the imaging modalities available, we have, on the one hand, hysterosalpingography, which highlights lesions in the fallopian tubes. This is an invasive, irradiating examination with low contrast resolution. On the other hand, pelvic ultrasound is the first-line examination, and MRI [8,9].

There are many reasons for consulting a doctor about pelvic pathology; the most common being pelvic pain, menometrorrhagia (bleeding), fertility problems, and pelvic floor disorders (prolapse of organs). The appearance of the uterus and adnexa varies in women depending on several parameters (morphological criteria; menstrual cycle; patient age; different contraceptive methods and hormonal treatments). Pelvic ultrasound is the first-line imaging examination of the female genital organs; it requires an experienced operator and high-quality equipment. It is generally performed in two stages: first, an upper abdominal scan to obtain an overview of the uterus and adnexa (ovaries and fallopian tubes), followed by a lower endovaginal scan for a more detailed examination of the cervix, uterus, ovaries, fallopian tubes, and peritoneum, with Doppler

analysis (which highlights vascularization) and three-dimensional imaging [10].

The importance of pelvic ultrasound has been demonstrated, and it requires not only a specialized practitioner but also state-of-the-art ultrasound equipment to optimize the diagnosis of this rather worrying condition in our part of the world, hence the interest of this study entitled "Evaluation of the uterus and ovaries by suprapubic and endovaginal ultrasound in women with fertility problems at the Notre Dame des Apôtres Hospital in N'Djamena."

➤ *General Objective*

To evaluate the different pelvic ultrasound practices used in the diagnosis of female infertility at Notre Dame des Apôtres Hospital in N'Djamena and compare them to international protocols.

➤ *Specific Objectives*

- To study the socio-professional characteristics of ultrasound staff.
- To investigate the practices of imaging staff regarding female infertility and compare them with the protocol of the French Society of Radiology.
- To highlight the shortcomings of pelvic ultrasound practice in cases of female infertility at Notre Dame des Apôtres Hospital.

II. METHODOLOGY

➤ *Location and Setting of the Study:*

Our study will be conducted in the ultrasound department of Notre Dame des Apôtres Hospital in N'Djamena, Chad.

➤ *Type of Study:*

- *Cross-Sectional Study*

➤ *Duration of Study:*

Our study will take place from June to October 2023, a period of four months.

➤ *Study Population:*

In terms of human resources, our team consisted of ultrasound technicians from the Notre Dame des Apôtres Hospital in N'Djamena, who was responsible for the survey, patient records, and the transmission of information for the documentary study.

➤ *Sampling:*

The sample size for our study is 17 staff members working in the ultrasound department who meet the inclusion criteria and are consecutive.

➤ *Inclusion Criterion:*

All staff members of the ultrasound department at Notre Dame des Apôtres Hospital who agreed to participate in the study by completing the questionnaire.

➤ *Exclusion Criterion:*

Staff members of the ultrasound department at Notre Dame des Apôtres Hospital who refuse to participate in the study or who have submitted an incomplete questionnaire.

➤ *Data Collection Tools*

The numbered anonymous forms were obtained with the informed consent of the staff.

➤ *Data Processing*

The data was processed using Microsoft Word and Excel software.

➤ *Procedure*

Three technical sheets were used:

The documentary study technique to identify the protocols used.

The survey technique among radio practitioners.

The observation technique, which will enable us to note any shortcomings and confirm or refute what we were told during the survey.

After obtaining authorization from the Director and ethical clearance from the University of Douala.

➤ *Conduct of the Survey*

This is the responsibility of V-11.

• *Data Processing and Analysis*

➤ *Material*

Table 1 Material

Material	Quantity
Technical data sheet	70
Office supplies (pen, pencil, eraser, correction fluid, notepad, envelope)	32
Ream of paper	2
USB flash drive	2
Laptop computer	1
Internet key	2
Ethical considerations	1

During the ultrasound scan, we explained the objectives of our study and sought informed consent from those who agreed to participate in the survey. The informed consent form was given to them to fill out on site, and we collected the completed questionnaires.

III. RESULTTS

During the ultrasound scan, we explained the objectives of our study and sought informed consent from those who agreed to participate in the survey. The informed consent form was given to them to fill out on site, and we collected the completed questionnaires.

➤ *Socio-Professional Characteristics of Personnel*

Table 2 Distribution of Personnel According to their Professional Qualifications

Professional Qualifications	Number	Percentage
Radiologist	2	11.76%
Gynecologist	2	11.76%
Engineer	5	29.41%
Technicians	3	17.64%
Ultrasound technician	3	17.64%
Ultrasound midwife	2	11.76%
Total	17	100%

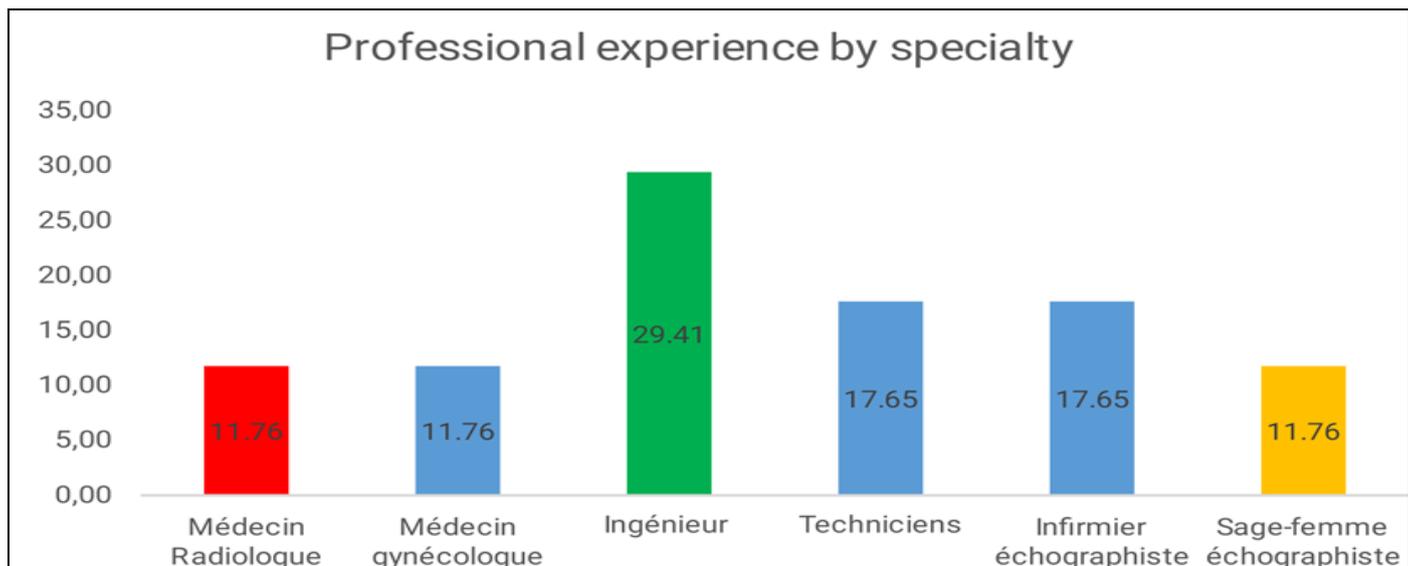


Fig 1 Professional Engineering Qualifications were the Most Common, with 17 Staff Members, or 29.41%.

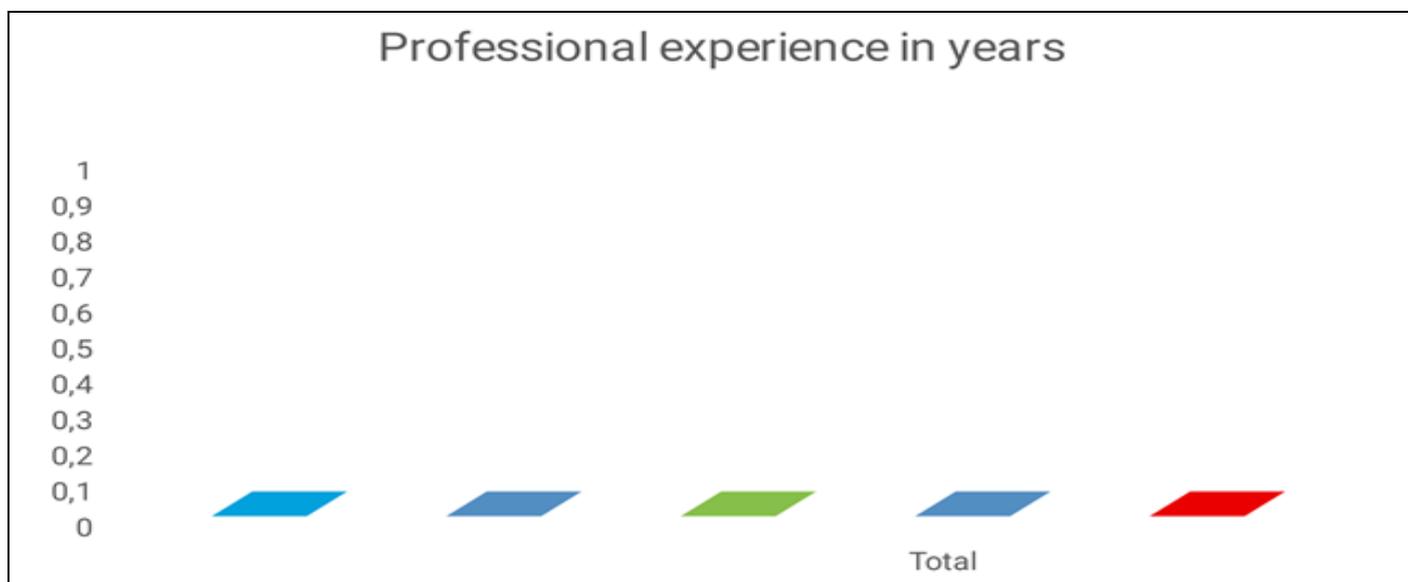


Fig 2 Distribution of Staff by Years of Experience

This diagram shows that 41.66% of respondents had between 0 and 5 years of experience, 41.66% had between 5 and 10 years of experience, and 16.66% had 10 or more years of experience.

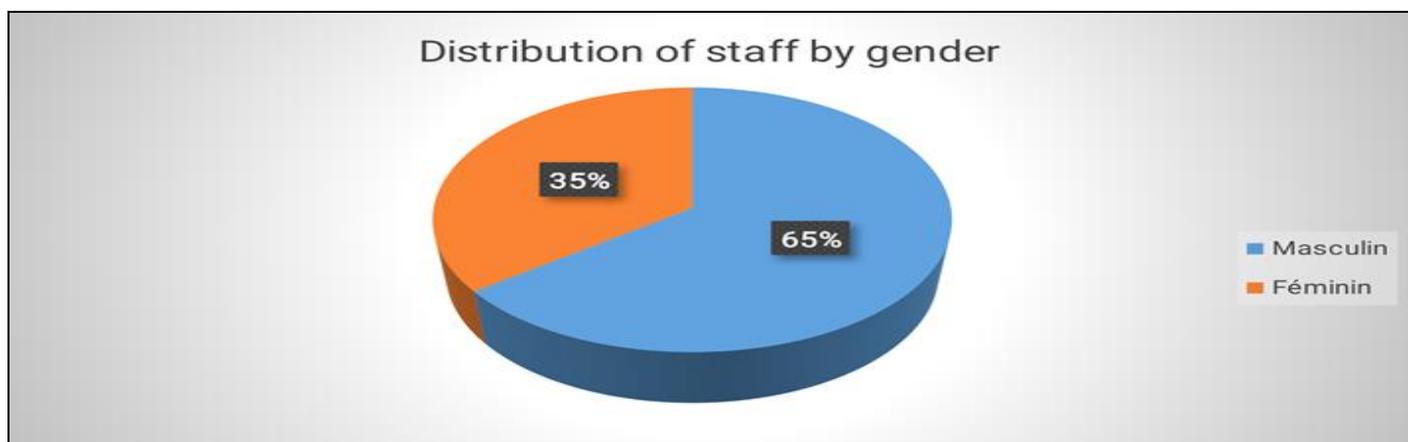


Fig 3 Distribution by Gender

• *The Fig Shows the Distribution of Staff by Gender.*

The Fig shows that 64.70% of respondents are male and 35.29% are female.

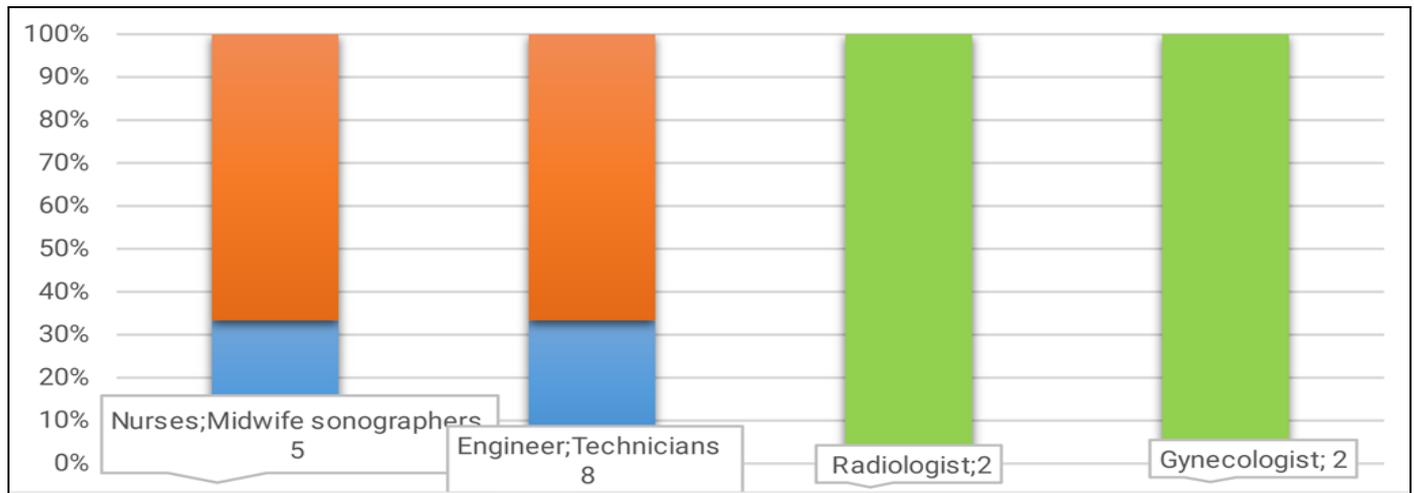


Fig 4 PCR (Competent Ultrasound Room Staff)

It appears that 100% of the staff in the ultrasound room at Notre Dame des Apôtres Hospital are competent.

Table 3 Number of Examinations Performed During Our Research

Exams performed	Number of patients	Percentage
Pelvic ultrasound	173	65.53%
Endovaginal ultrasound	91	34.46%
Total	264	100%

Table 4 Technical Means of Protection and Prevention

1	Sterile glove	Existing/Used
2	Face mask	Existing/used
3	Hydroalcoholic gel	Existing

Table 5 Staff Knowledge of the Principles of Pelvic Ultrasound

Knowledge of pelvic ultrasound practice	Number	Percentage
Yes	17	100%
No	0	0%
Total	17	100%

The table above shows staff knowledge of the principles of pelvic ultrasound practice.

It shows that 100% of the staff surveyed had a good understanding of the principles of pelvic ultrasound practice.

IV. DISCUSSIONS

We conducted a descriptive, cross-sectional, prospective study.

The appropriate methodology enabled us to conduct a comprehensive study of gynecological conditions from June 2023 to October 2023, for which pelvic ultrasound was the examination method used.

➤ *Distribution of Staff According to their Qualifications Professionals*

Engineers were the most represented in our study, with 17 staff members, or 29.41%. Our results are broadly similar

to those of SANOGO M, who found an average age of 27.78 years, with extremes of 18 and 47 years [21].

Our results are close to those of other African authors; for Coulibaly K & al. The majority of patients were between 25 and 29 years old, DIADHIOU F between 20 and 29 years old, BODY G. et al. found an average age of 29.3 years. Age appears to influence the type of gynecological condition [22, 23, 24].

According to J Lansec and P Lecomte, urogenital infections generally affect young women under the age of 25 [25]. This increase among young women may be linked to estrogenic cervical mucus, the desire to have children at this age, but also insufficient information about sexually transmitted infections.

➤ *Distribution of Staff According to Years of Experience*

The majority of our patients were married, with 56 out of 70 cases, representing a prevalence of 80%. We noted

eleven single women and three divorced women. Our results are comparable to those of SANOGO M [21], who reported 97 married women out of 100, or 97%, two divorced women, or 0.2%, and one (1) single woman. The majority of women were married.

This could be explained by the desire to have children in the home and, on the other hand, to avoid the impact of sociocultural prejudices.

➤ *Distribution by Gender*

In our study, out of 17 staff members, 64.70% of respondents were male and 35.29% were female PCR (ultrasound room staff). The majority of our patients resided in the urban commune of N'Djamena. This could be explained by the proximity of the hospital to this population. The study of residence could be used in the evaluation of the cost of care.

➤ *Number of Examinations Performed During Our Research*

Pelvic ultrasound on 173 patients, or 65.53%, endovaginal ultrasound on 91 patients, or 34.46%.

This could be explained by the high rate of female school enrollment in the city of N'Djamena.

According to the Mali VI Demographic Health Survey (EDSM-VI), uneducated women accounted for 72.1% of the population in the Mopti region [26].

➤ *Technical Means of Protection and Prevention*

The protective and preventive measures in the ultrasound room were gloves, face masks, and hand sanitizer.

However, some authors found higher values. SANOGO M reported 82 cases of infertility, or 82%, as information, 9 cases of cycle disorders, and Traore Yacouba and Sanogo M found 65% of women wanted to get pregnant and 17.5% had pelvic pain [21, 27].

This variation in figures could be explained by the different clinical information reported as the reason for consultation. These reasons are reported more frequently in several studies conducted in Mali [12, 18, 32] and also in several other African countries [15].

➤ *Staff Knowledge of Pelvic Ultrasound Principles:*

According to the survey of ultrasound department staff, knowledge was 100%.

Ovarian pathologies were represented by functional cysts on the right side (4.2%), organic cysts on the left side (16%), bilateral functional cysts (8.5%), polycystic ovaries on the right side (13%), and bilateral polycystic ovaries (18.5%). These results differ from those of Barrigah and Dovonou [28], who found 73.7% of micropolycystic ovarian dystrophies and 26.3% of cysts, while Biaou et al [29] observed 77.1% of micropolycystic ovarian dystrophies versus 22.9% of ovarian cysts. This difference in rates could

be explained by differences in sociodemographic profiles and dietary habits, as well as sedentary lifestyles in the sites/countries studied.

The predominance of uterine fibroids in our study corroborates the findings of Barrigah and Dovonou in 2008. It is also widely recognized that melanoderms are at increased risk of uterine fibroids.

However, some authors have found higher figures: Gandji et al. 37.6%, Cissé et al. 38.3% of uterine lesions. [30, 31]. This difference in figures could be explained by the predominance of tubal pathologies on the one hand and, on the other hand, multiple lesions (uterotubal, which accounted for 22.5%). These multiple lesions were synechiae, fibroids, and uterine malformations associated with tubal pathologies.

V. LIMITATIONS OF THE STUDY

Like any human work, our study had limitations that could negatively affect the quality of the data.

Finally, despite the use of certain concepts designed to reduce discomfort among respondents, the taboo nature of sexuality is an aspect that could influence their willingness to provide information about their actual practices. Nevertheless, the information obtained is more or less consistent with the conclusions of certain previous studies, but above all reflects current behaviors, proving that these studies provide insight into the level of knowledge and behaviors related to pelvic practices.

➤ *Difficulties Encountered:*

- Insufficient qualified permanent staff
- Insufficient maintenance staff
- Poor reception of patients
- Poor behavior of staff towards trainees
- Lack of transportation for staff

VI. RECOMMANDATIONS

➤ *At the End of Our Study, we Recommend:*

- *To the Ministry of Public Health:*
 - ✓ Promote the training of ultrasound specialists.
 - ✓ Provide continuing education for medical imaging technicians.
 - ✓ Create imaging training schools in Chad.
- *To Healthcare Personnel:*
 - ✓ Revitalize pelvic ultrasound examinations.
 - ✓ Train and retrain medical imaging personnel.
 - ✓ Improvement of working conditions for staff in the ultrasound room.
 - ✓ Raising public awareness of the importance of pelvic ultrasound.

• *For the General Public:*

- ✓ Improvement of personal hygiene and environmental hygiene measures.
- ✓ Consultation as soon as possible in case of fertility problems.

VII. CONCLUSION

Our study enabled us to assess the value of pelvic ultrasound in gynecological conditions in the Ultrasound Department at Notre Dame des Apôtres Hospital.

The clinical profile was dominated by primary and secondary infertility, pelvic pain, and recurrent miscarriages.

The lesions observed were dominated by bilateral polycystic ovary syndrome on pelvic ultrasound, which in most cases were the sequelae of untreated or poorly treated infections.

Pelvic ultrasound remains one of the first-choice examinations in the investigation of primary and secondary infertility, but it should be supplemented by other appropriate examinations with a view to subsequent etiological treatment.

The etiological investigation of female infertility must be a multidisciplinary approach, in which pelvic ultrasound plays a key role in establishing a presumptive diagnosis.

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