

# Hysterosalpingography Profile of Utero-Tubal Lesions in Female Infertility in Mopti (Mali, West Africa)

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## Abstract

**Introduction:** Infertility is the inability to achieve pregnancy after 12 months of regular, unprotected sexual intercourse by a couple of childbearing age. It is a real public health problem because of its high prevalence in both developed and developing countries. Female infertility occupies a prominent place in reproductive health in Africa such as in our country Mali. The objective of this work was to determine the hysterosalpingography profile of utero-tubal lesions in the etiological research of female infertility in Mopti. **Materials and Method:** This was a cross-sectional descriptive study covering a period of one year from January 2019 to December 2019 in the radiology department of Sominé Dolo Hospital in Mopti. The variables analyzed were patient age and hysterosalpingography results. The hysterosalpingography examination was performed 3 or 4 days after menstruation on a remote-controlled table under fluoroscopic control. Data analysis was done with the aid of SPSS version 22 and Excel 2016 software. **Results:** During the study period, 9012 patients were seen in the imaging department, including 115 patients, or 1.3% for infertility assessment. The 25 - 29 age group was the most represented with 34 patients or 29.6%. The mean was  $30.39 \pm 6.96$  years with extremes of 17 and 46 years. Tubal abnormalities represented 45 cases or 39.1%. Hydrosalpinx was the most prevalent with 26 cases or 36.6%. **Conclusion:** Tubal lesions were the most observed, especially hydrosalpinx following. Hysterosalpingography remains the first choice in the radiological assessment of female infertility in our context.

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## Keywords

Infertility, Hysterosalpingography, Hydrosalpinx, Mopti Hospital

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### 1. Introduction

Infertility is the inability to achieve pregnancy after 12 months of regular, unprotected sexual intercourse by a couple of childbearing age [1]. There are 2 categories of infertility: primary and secondary. Primary infertility is defined by the absence of any previous pregnancy, while in secondary infertility the couple has had a previous pregnancy [2]. This differentiation is important because of the better prognosis for secondary infertility. However, the diagnostic work-up for the two types of infertility is identical [2].

It is a real public health problem because of its high prevalence in both developed and developing countries [3]. According to the WHO, the rate of female infertility is 30% in sub-Saharan Africa [4] [5]. Infertility deserves to be taken care of in a delicate way because it is often a reason for the separation of couples in Africa and psychological disorders in the West [4]. Female infertility occupies a prominent place in reproductive health in Africa [6]. Tubal involvement is found in 25% to 35% of infertile women [6].

Hysterosalpingography (HSG) is a radiographic examination that allows the visualization of the endocervical canal, the uterine cavity, and the fallopian tubes by intracervical injection of a contrast product opaque to X-rays followed by taking successive shots [7]. It is the recommended first-line imaging examination for initial tubal exploration in the management of infertility [6]. The objective of this work was to determine the hysterosalpingography profile of utero-tubal lesions in female infertility in Mopti.

### 2. Materials and Method

This was a descriptive cross-sectional study covering a period of one year from January 2019 to December 2019 in the radiology department of the Sominé Dolo hospital in Mopti fifth administrative region of Mali (West Africa).

The variables analyzed were the age of the patients and the results of the hysterosalpingography (uterine anomalies, tubal anomalies, and combined anomalies, i.e. uterine and tubal at the same time).

Were included in all patients who consulted the gynecology-obstetrics department for infertility and who underwent a hysterosalpingography examination in the hospital. Non-consenting patients and those with less than one year of marriage were not included.

The age of the patients were collected from the request form for the hysterosalpingography examination of each patient. The results were collected through pre-established form for this purpose such as the seat (uterine, tubal or both), types of lesions or result normal.

The hysterosalpingography examination was performed 3 or 4 days after menstruation on a remote-controlled table under scopic control. After psychological preparation, the patient was lying on the examination table in the gynecological position. An image without preparation centered on the pelvis was taken. After the placement of a sterile speculum, the exocervix was cleaned. A hystrometer was used before placing the cervical cannula. Injection of the contrast product was performed slowly with the progressive taking of AP, oblique, or profile views as needed, starting with the thin layer until tubal opacification with or without peritoneal mixing. A final impact of evacuation concluded the exploration. The images were then analyzed by the radiologist.

We took ethical aspects into account during our study. Patient anonymity during data collection was a must. In addition, the confidentiality of the results of each patient was respected.

Data analysis was done with the aid of SPSS version 22 and Excel 2016 software.

### 3. Results

During the study period, 9012 patients were seen in the imaging department, including 115 patients, or 1.3%, for infertility assessment.

The 25 - 29 age group was the most represented with 34 patients or 29.6%. The mean was  $30.39 \pm 6.96$  years with ends of 17 and 46 years (**Table 1**).

Tubal abnormalities accounted for 45 cases or 39.1%. However, the result was normal in the majority of the patients with 44 cases or 38.3% (**Table 2**).

**Table 1.** Distribution of patients according to age.

Age groups	n	%
≤19 years	6	5.2
20 - 24 years	19	16.5
25 - 29 years	34	29.6
30 - 34 years	22	19.1
35 - 39 years	20	17.4
40 - 44 years	13	11.3
≥45 years	1	0.9
Total	115	100

**Table 2.** Distribution of patients according to hysterosalpingography results.

Results	n	%
Normal	44	38.3
Uterine lesions	10	8.7
Tubal lesions	45	39.1
Uterine + tubal lesions	16	13.9
Total	115	100

**Table 3.** Distribution according to the nature of lesions on hysterosalpingography.

Seat	Lesions	n	%
Tubal	Hydrosalpinx	26	36.6
	Tubal obstruction	19	26.8
Uterine	Uterine synechiae	4	5.6
	Malformation	2	2.8
	Submucosal uterine fibroid	2	2.8
	Isthmic neck open bite	1	1.4
	Adenomyosis	1	1.4
Utero-tubal	Uterines + tubals	16	22.6
Total		71	100

**Figure 1.** Hysterosalpingography showing bilateral hydrosalpinx. (A)-(B): views of the face in fullness in two different patients. (C): frontal evacuation image of the case in B.

Hydrosalpinx was the most represented with 26 cases or 36.6%. The tubal obstruction ranked second with 19 cases or 26.8% (Table 3). Figure 1 is an illustrative example of hydrosalpinx in two different patients.

#### 4. Discussion

The 25 - 29 age group was the most represented with 34 patients or 29.6%. The mean was  $30.39 \pm 6.96$  years with extremes of 17 and 46 years. According to Mathurin *et al.*, the most represented age group was that of 22 - 26 years with 35.9% [8]. In a Cameroonian study, the age group most affected was between 29 and 34 years [9]. A Beninese study had found a predominance of the 30 - 34 age group, *i.e.* 35.4% [10]. Gandji *et al.* stated that infertile women are more numerous between 30 and 39 years old [11]. The age varies from author to author. This could be in relation to the socio-cultural realities of each population.

In our series, tubal anomalies accounted for 45 cases or 39.1%. Hydrosalpinx was the most represented anomaly with 26 cases or 36.6%. Proximal tubal obstruction was in second place with 19 cases or 26.8%. Multisite anomalies (uterine and tubal anomalies) accounted for 22.6%. Isolated uterine lesions were rare in our study. According to the study by Sanogo M, tubal pathologies were the most represented with 44 cases (44%) of the total population [12]. Hydrosalpinx ranked second with 13% after proximal tubal obstruction, *i.e.* 31% [12]. According to Mathurin *et al.*, tubal lesions were the most frequent with 66.66%,

followed by unilateral proximal tubal obstructions at 13.33%, bilateral proximal with 10%, unilateral distal with 6.66% and bilateral distal with 3.33%, hydrosalpinxes were observed in 13.33% [8].

Tubal obstruction is an obstruction of the uterine tubes by the development of intra-tubal mucous plugs which can lead to tubal infertility [13]. They prevent the meeting of sperm and egg. They can be proximal, interstitial, isthmic, or distal [13]. Distal tubal obstructions concern the ampulla and the pavilion. They are characterized by fluid retention in the ampulla and the tubal pavilion (hydrosalpinx) leading to an absence of peritoneal passage of the contrast product [13].

Hysterosalpingography (HSG) contributes to the diagnosis of uteroadnexal pathologies in addition to other techniques such as ultrasound, and especially diagnostic laparoscopy and hysteroscopy [7]. HSG is the best-suited non-invasive method for studying the utero-tubal canal [7]. It remains the main imaging modality for the fallopian tubes [2]. It is used to assess both the architecture of the tubes and their permeability [2]. In addition, an increase in the pregnancy rate of around 30% to 50% has been shown in the six months following hysterosalpingography [2].

Our study has the limitation of being intra-hospital, taking into account only patients who underwent hysterosalpingography during the study period. However, this is a first in the Mopti region in the field of medical imaging. It now constitutes a reference for subsequent work.

## 5. Conclusion

Tubal lesions were the most observed, especially hydrosalpinx. Hysterosalpingography remains a radiological means of the first choice in the assessment of female infertility in our context.

## Author Approval

All authors agree to the submission of this article.

## Consent

For this work, we received the consent of the patient as well as that of the head of a department.

## Conflicts of Interest

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

## References

- [1] Nana, P.N., Wandji, J.C., Fomulu, J.N., Mbu, R.E., Leke, R.J.I. and Woubinwou, M.J. (2011) Psycho-Social Aspects in Infertile Patients at the Main Maternity Unit of the Central Hospital of Yaoundé, Cameroon. *Clinics in Mother and Child Health*, **8**, 1-5.
- [2] Maubon, A., Pouquet, M., Piver, P., Mazet, N., Viala-Trentini, M. and Rouanet, J.P.

- (2008) Imaging of Female Infertility. *Journal of Radiology*, **89**, 172-183. [https://doi.org/10.1016/S0221-0363\(08\)70391-3](https://doi.org/10.1016/S0221-0363(08)70391-3)
- [3] Forti, G. and Krausz, C. (1998) Clinical Review 100: Evaluation and Treatment of the Infertile Couple. *Journal of Clinical Endocrinology & Metabolism*, **83**, 4177-4188. <https://doi.org/10.1210/jc.83.12.4177>
- [4] Kouamé, N., N'goan-Domoua, A.M., Konan, N., Séchéou, A., N'gbesso, R.D. and Kéita, A.K. (2012) Contribution of Transvaginal Ultrasound Combined with Hysterosalpingography in the Etiological Research of Female Infertility in Abidjan (Ivory Coast). *African Journal of Reproductive Health*, **16**, 43-49.
- [5] ORC Macro and the World Health Organization (2004) Infecundity, Infertility, and Childlessness in Developing Countries. Demographic and Health Surveys (DHS) Comparative Reports. <http://dhsprogram.com/pubs/pdf/CR9/CR9.pdf>
- [6] Opheelia, M.K., Ja, B.N., Minkobame, U., Assoumou, P., Tchantchou, T.D.D., Aeio, S., *et al.* (2021) Hysterosalpingography versus Laparoscopy in the Evaluation of Tubal Permeability during Infertility Assessment. *Health Sciences and Disease*, **22**, 29-33.
- [7] Guena, M.N., Amvene, J.M., Moifo, B., Nkeugoung, B., Diallo, C., Amvene, S.N., *et al.* (2021) Practice of Hysterosalpingography at the Regional Hospital of Ngaoundéré. *Health Sciences and Disease*, **15**, 1-6.
- [8] Mathurin, N.G., Soléne, T.K., Zilbinkai, A. and Joseph, G.F. (2018) Clinical Epidemiologic, Ultrasound, and Hysterosalpingography Profile of Female Infertility at the Regional Hospital of Ngaoundéré. *Journal of African Medical Imaging*, **10**, 185-193.
- [9] Priso, E.B., Nguéfac, C.T., Nguemgne, C., Njamen, T.N., Taila, W. and Banag, E. (2021) Female Infertility at the Douala General Hospital: Epidemiological and Radiological Aspects (about 658 Cases). *Journal of African Medical Imaging*, **7**, 16-23.
- [10] Houngnibo, F.C., Loko, F., Dossou, J., Hounsossou, H., Adisso, S. and Ahouansou Yekpe, P. (2011) Diagnostic Contribution of Hysterosalpingography and Endoscopy in the Assessment of Female Infertility in Hospitals in Cotonou. Master's Dissertation, University of Abomey-Calavi (UAC), Abomey-Calavi. <https://biblionumeric.epac-uac.org:9443/jspui/handle/123456789/1485>
- [11] Gandji, S., Adisso, S., Atrévi, N., Dougnon, T.V., Bankolé, H.S., Hontonnou, F., *et al.* (2013) Etiological Diagnosis of Lesions of Secondary Infertility in Cotonou: rOle of Hysterosalpingography and Pelvic Ultrasound. *Journal of Applied Biosciences*, **68**, 5349-5355. <https://doi.org/10.4314/jab.v68i0.95059>
- [12] Sanogo, M. (2005) Contribution of Hysterosalpingography in the Diagnosis of Gynecological Disorders about 100 Cases in the Radiology Department of the Gabriel Touré Hospital. Medical Thesis. University of Sciences, Techniques, and Technologies of Bamako, Bamako. <http://www.keneya.net/fmpos/theses/2006/med/pdf/06M65.pdf>
- [13] Zounon, G.N.G., Atrévi, N., Topanou, R., Gbaguidi, B.A. and Aze, M. (2017) Contribution of Hysterosalpingography to the Diagnosis of Infertility in Women: The Case of the Sancta Maria Socio-Medical Diagnosis Center in Parakou. Final Dissertation. University of Abomey-Calavi (UAC), Abomey-Calavi. <https://biblionumeric.epac-uac.org:9443/jspui/handle/123456789/1995>