Hysterosalpingographic Interrogation of Infertility at Lagos State University Teaching Hospital (LASUTH), Ikeja, Nigeria

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ABSTRACT

Background: The African traditional society places a high premium on fecundity and therefore, views infertility as a personal tragedy. Prolonged infertility might lead to suicidal tendencies, stigmatization, marital instability, and enormous psychological stress. In recent times in Nigeria, there appears to be an upsurge in the number of couples investigated for infertility using hysterosalpingography (HSG).

Objective: To observe the trend of HSG findings at a foremost tertiary hospital in Nigeria.

Methods: A consecutive enlistment of HSG radiographs concluded and reported on between July 2014 to December 2018. Using an inclusion criteria of patients who had an initial ultrasound scan prior to HSG as noted from radiologists reports, a sample size of 623 radiographs was enlisted from a HSG population of 2,624 cases. Patients' demographic information were extracted from their request cards and radiologists' reports.

Results: Patients were aged 22 – 54 (mean: 36.30 ± 6.00) years, with a modal age range of 31 – 40 year (58.5 %) showing the highest throughput. Hysterosalpingography abnormalities were in two broad sites of uterus and fallopian tubes with the former showing a higher frequency ((n = 362, 58.11 %). Specifically, fibroid (n = 198, 31.80 %) and congenital anomalies (n = 24, 3.80 %) were the most and least prevalent abnormalities, respectively.

Conclusions: Women aged 31 – 40 years were the most common patients for HSG, and uterine fibroid was the most common abnormality found in this study.

Keywords: Infertility; hysterosalpingography; uterus; fallopian tubes; fibroid

Introduction

Infertility is the failure to achieve conception after a minimum of 12 months of regular, unprotected sexual intercourse. The condition is medically subdivided into primary and secondary with the former representing an absence of conception whatsoever, while the latter represents a subsequent inability to conceive after a previous one [1]. Congenital anomalies, anatomical abnormalities and hormonal imbalance are broad-based reasons for infertility, but in practical terms, the key indicator is tubal blockage [2, 3]. The Prevalence of infertility in Nigeria ranges from 4 % to 48.1 % and there are no evidence to suggest that this is influenced by religion, tribe, education, weather, or locality [1, 4, 5].

The African traditional society places a high premium on fecundity [6]. Infertility therefore, is seen as personal tragedy and may lead to suicidal tendencies [2], stigmatization, marital instability, and enormous psychological stress [1, 6]. Despite a Nigerian population estimated to be over 200 million persons, the zeal by couples to procreate profusely appear to be a key performance indicator in marriage [7].

In recent times, perhaps due to education and enlightenment, there appears to be an upsurge in the number of couples turning to orthodox medicine for help, with radiological investigations like hysterosalpingography (HSG) playing key roles. Hysterosalpingography is an x-ray-based, invasive, evaluation of the uterine cavity and fallopian tubes for infertility [6, 8]. Other indications for HSG include postoperative evaluation of tubal ligation or reversal of tubal ligation, congenital anomalies, polyps, leiomyomas, surgical changes, synechiae, adenomyosis, tubal occlusion, hydrosalpinx, and peritubal adhesions, etc. But the primary role of HSG is in the evaluation of fallopian tubes [8].

The sensitivity and specificity of HSG are noted to be quite high thereby making it a popular method of investigation, despite the inherent radiation risks [6, 9, 10]. Sensitivity measures the number of people who truly have the disease who test positive, whereas specificity measures the number of people who do not have the disease who test negative [2].

Lagos city in Nigeria is reputed to be the most populated in Africa with a population of about 14 million persons. Results from this work can therefore, be extrapolated to any other city in Africa. The Lagos State University Teaching Hospital (LASUTH), although one out of several in the city, is considered one of the busiest [7]. The hospital was established in 2001 to cater for a population of $\geq$ 14,000,000 persons. Just like similar teaching hospitals in Nigeria, the radiology department had a retinue of radiographers, radiography interns, radiologists, radiology residents, nurses and other ancillary staff. The department was also equipped with state-of-the-art radiological modalities.

A previous work carried out by other authors in the department between 2008 – 2011 reported that the mean age of HSG patients was 34.58 years (range: 27 and 42 years) and with secondary infertility as the most prevalent (86.96 %) [11]. One decade later, the department had moved fully from analogue into digital technology and the number of radiographers and radiologists had improved significantly [9]. The present work was replicated to observe the trend of HSG findings in line with departmental advancement.

Materials and Methods
The work was approved by the institutional ethical Committee (LASUTH/LREC/06/10/1151). Since contact with patients was not part of the design of the study, informed consent was not obtained. This study was retrospective and cross sectional and involved radiographs of HSGs concluded and reported on between April 2014 to December 2018. Each HSG procedure was carried out by a team comprising radiographers, radiologists and nurses, and an average of 500 HSG cases were done at the centre each year. Specific technique for HSG was as described in the literature [2, 11]. Using an inclusion criteria of patients who had an initial ultrasound scan prior to HSG as noted from radiologists reports, a sample size of 623 radiographs was consecutively enlisted from a HSG population of 2,624 cases. Patients' demographic information were extracted from their request cards and radiologists' reports.

Results
As shown in Table 1, a total of 2,624 HSG cases (N) of patients aged 22 – 54 (mean: 36.30 ± 6.00) years were done within the 5-year period (2014 – 2019). A sample size of 623 cases (n) was drawn from this with secondary infertility being more prevalent (n = 469, 75.3 %). When ages were stratified into a 10-year range, the modal group was the 31 – 40 year age range (n = 365, 58.5 %). This is shown in Table 2. Hysterosalpingography findings were in two broad sites of uterus and fallopian tubes with the former having more frequency ((n = 362, 58.11 %). Specifically, fibroid (n = 198, 31.80 %) and congenital anomalies (n = 24, 3.80 %) were the most and least prevalent abnormality, respectively.

This is summarized in Table 3. A comparison of findings from current work with similar ones across Nigeria is shown in Table 4. The mean age of patients revolved around 30 years and above and below 40 years. Only in one instance did the mean age drop below 30 years. All but one study found secondary infertility as the more prevalent type in Nigeria, and all parts of the female genital tract are implicated. The previous study in LASUTH [11], had a fairly younger group of patients (mean: 34.58 years). It corroborated present work in having secondary infertility as the more prevalent condition.

Table 1. Demographic characteristics of patients

Parameter	Infertility type		Total
	Primary	Secondary	
Population (N)	678	1,946	2,624
Sample size (n)	154	469	623
	(24.7 %)	(75.3 %)	
Age range (year)	25 - 54	22 - 46	22 - 54
Mean ± SD	38.14 ± 6.25	34.71 ± 8.35	36.30 ± 6.00

Table 2. Distribution of patients into age range

Age (years)	Frequency (n)	Percentages (%)
21 - 30	128	20.5
31 - 40	365	58.5
41 - 50	121	19.5
51 - 60	9	1.5
Total	623	100

Table 3. Hysterosalpingography (HSG) findings

Parameters	Frequency	Percentage
Uterus (n = 362, 58.11 %)		
Congenital anomalies	24	3.80
Adhesions	140	22.50
Fibroids	198	31.80
Fallopian tubes (n = 261, 41.89 %)		
Hydrosalpinx	102	16.40
Occlusion	159	25.50
Gross total	623	100.00

Discussions

This study analyzed the results of 623 women who underwent HSG examinations between 2014 to 2019 at the Lagos State University Teaching Hospital (LASUTH), Lagos, Nigeria. They were aged 22 to 54 years with mean of 36.30 ± 6.00 years. A similar study a decade earlier at LASUTH [11], found the patients to be younger, 27 – 42 years (mean: 34.58 years), and secondary infertility to have a high prevalence of 86.96 %. The present study found slightly older patients (mean: 36.30 ± 6.00 years) and a slightly lower secondary infertility prevalence rate of 75.3 %. The upper limit of age (54 years) in the present study may be an indication of late menopause in the population or menopausal women who still believe in miracles. Although the mean age of patients from the present study was the highest seen in the locality (36.30 ± 6.00 years), it fell within the same range of 30 – 40 years with similar works from the locality [11 -14]. However, a lone work from northern Nigeria reported a lower mean age of 28.9 ± 6.5 years [1].

The implication of this finding is that infertility did not discriminate on the basis of religion, location, and age. It occurred in lower and older persons, and in all locations. A work carried out amongst Pakistani population however, indicated that location had a role to play as rural-based patient had more infertility-related cases than their urban counterpart [2]. Our current work, as well as previously cited Nigerian works, were unable to differentiate rural from urban-based patients due to its retrospective design, unlike the Pakistani one which was carried out prospectively and took detailed history from patients. It is possible that future works done prospectively may find correlation between location, other social variables and infertility.

It is also noteworthy that HSG which is an invasive procedure is a popular method of investigating infertility [1, 12–14]. That patients are also willing to take the additional risk of irradiation from a carcinogen like x-ray [8, 15]

Table 4. Comparison of findings in present with previous works

Author	Geopolitical zone of Nigeria	Mean age (years)	More prevalent infertility type	Area of reproductive organ implicated for infertility
Present study	Southwest	36.30 ± 6.00	Secondary (75.3 %)	Uterus
Balogun, et. al.[11]	Southwest	34.58	Secondary (86.96 %)	Fallopian tubes
Njoku, et. al. [12]	Southwest	34.9 ± 5.3.	Secondary (57.0 %)	Uterus
Udobi & Aronu [13]	Southeast	32.33 ± 6.02	Primary (56.1 %)	Uterus & Fallopian tubes
Panti & Sununu [1]	Northwest	28.9 ± 6.5	Secondary (67.2 %)	Genital tract
Danfulani, et.al. [14]	Northwest	32.5 ± 5.5	Secondary (54.9%)	Fallopian tubes

suggests a changing trend from belief in superstition to dependence on orthodox medical practice. If this trend is sustained, health indices like life expectancy and morbidity are expected to improve in Nigeria, and indeed in Africa [7]. In addition, it is speculated that HSG has both diagnostic and therapeutic values as certain minor uterine adhesions and partial tubal occlusion are lysed, leading to an increase in pregnancy rate in the months after Hysterosalpingography without any other gynaecological intervention [8]. This window of hope may have motivated some patients to go to hospital.

In this study, uterine pathology were more common (58.11 %) than those from fallopian tubes (41.89 %) and with fibroid as the most common challenge (31.80 %). Our finding in this regard is in concordance with only a single work carried out in the same Lagos locality and in a neighboring teaching hospital [12]. Contrariwise, majority of works see tubal blockage as the single major cause of infertility (1, 12 – 14). The discrepancy may be due to the focus of each group of researchers. Whereas the two aligning works

were focused on general findings following HSG investigations, the dissenting works were focused *ab initio*, on fallopian tubes. Since HSG is basically for investigation of tubal patency [8], future designs should focus on fallopian tubes.

There were a few limitations in this work. The retrospective nature of the work did not give room for interaction with patients to clerk them further and ascertain their real ages, as well as their reasons for coming to hospital. Furthermore, data used by previous researchers and stored in departmental archives was re-used by our team as it was difficult to demarcate them. In conclusion, although the ages of patients presenting for HSG investigations at LASUTH had increased, secondary infertility remained the more prevalent type, but with minimal drop in percentage.

References

1. Panti AA, Sununu YT. The profile of infertility in a teaching hospital in North West Nigeria. Sahel Med J 2014; 17(1): 7-11. https:// www. smjonline.org/text.asp?2014/17/1/7/129145

2. Mushtaque S, Aamir MO, Mian A, Shah AR, Saleem H, Rauf S, Iftikhar S. To determine frequency of tubal blockage in infertility patients undergoing x-rays hysterosalpingography. Pakistan J Radiology 2018; 28(4) 272 - 276

3. Adedigba JA, Idowu BM , Hermans SP, Ibitoye BO, Fawole OA. The relationship between hysterosalpingography findings and female infertility in a Nigerian population. Pol J Radiol., 2020; 85: e188-e195 DOI: https://doi.org/10.5114/pjr.2020.94488

4. Abiodun OM, Balogun OR, Fawole AA. Aetiology, clinical features and treatment outcome of intrauterine adhesion in Ilorin, Central Nigeria. West Afr J Med 2007;26:298-301.

5. Mohammed-Durosinlorun A, Adze J, Bature S, Abubakar A, Mohammed C, Taingson M, Airede L. Awareness and willingness to adopt among infertile women seen at a tertiary hospital in Northern Nigeria. African Journal for Infertility and Assisted Conception. 2018; 3(1): 10

6. Botwe BO, Bamfo-Quaicoe K, Hunu E, Anim-Sampong S. Hysterosalpingographic findings among Ghanaian women undergoing infertility work-up: a study at the Korle-Bu Teaching Hospital. Fert Res Pract., 2015;1 (9): doi:10.1189/s40738-015-0001-6

7. Adejoh, Thomas. An Inquest into the Quests and Conquests of the Radiography Profession in Nigeria. Journal of Radiography & Radiation Sciences (JRRS), 2019; 33(1): 1 – 38

8. Naqi S, Shafqat-Ul-Islam S, Raza S, Haroon H. Pattern of pathologies on hysterosalpingography in primary infertility and review of literature. Pakistan Journal of Radiology 2008; 18(3): 82-86

9. Adejoh, T., Ewuzie, O.C., Ogbonna, J.K., Nwefuru, S.O. and Onuegbu, N.C. A Derived Exposure Chart for Computed Radiography in a Negroid Population. *Health*, 2016; 8, 953-958. http://dx.doi.org/10.4236/health.2016.810098

10. Heis M, Amarin Z, Ibrahim AY, Obeidat N, Omari M. Uterine and tubal anatomical abnormalities in infertile women: diagnosis with routine hysterosalpingography prior to selective laparoscopy. S Afr J Radiol., 2011;15(4):120–122

11. Balogun BO, Adegboyega OA, Awosanya GOG. Tubal abnormalities in patients with intrauterine adhesion: Evaluation using hysterosalpingography. Ann Afr Med, 2014; 13(4): 179- 183

12. Njoku J, Abonyi LC, Eze CU. Common Hysterosalpingographic Findings in Infertility Cases in Lagos State, Nigeria. Journal of Association of Radiographers of Nigeria, 2012; 26:1 – 7.

13. Udobi SI, Aronu ME. Hysterosalpingographic findings in women with infertility in Awka, Anambra State, South-East Nigeria. Niger J Surg Sci 2017;27:47-50

14. Danfulani M, Mohammed MS, Ahmed SS, Haruna YG. Hysterosalphingographic findings in women with infertility in Sokoto North Western Nigeria. Afr J Med Health Sci 2014;13:19-23

15. Adejoh T, Ezeh HC, Aronu ME, Nzotta CC, Nwefuru SO (2017). A Technique for Appropriate Inferior Collimation in Chest Radiography of Asymptomatic Negroid Adults. *West African Journal of Radiology*;24(1):52-5.