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Original Research Article

Uterine and Tubal Findings of Infertile Women in the Reproductive Age Group

Bobmanuel E. F.[1], Horsfall A. U.[1], Victor P. D.[1*], Ajie P. C.[1], Okpara P. E.[1], Reuben E.[1], Amadi-ikpa, H.A. [1]

[1]Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu Oroworukwo, Port Harcourt, Nigeria

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***Corresponding author:** Victor P. D.
Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu Oroworukwo, Port Harcourt, Nigeria

Abstract

Infertility affects approximately 10% of the world's population and has been termed the 5th highest serious global disability by the World Health Organization WHO, (2018). It is defined as the inability of a couple to achieve pregnancy after 1 year of regular sexual intercourse of at least thrice a week or after an achieved pregnancy. Fertility declines with age in both men and women, but the effects of age are greatly pronounced in women due to multifactorial causes in women. Hysterosalpingography (HSG) is the radiographic examination of the uterus and fallopian tubes and is regarded as the gold standard for assessing the fallopian tubes, providing accurate information on their patency and shape. Limitations to hysterosalpingography are seen in identifying uterine factors affecting fertility in most findings. Other radiographic examinations such as the ultrasound scans should be used alongside in evaluating findings of infertility as it gives precise description of the outline of the uterus and can capture intramural myoma which isn't easily seen on hysterosalpingogram scans hence the importance of combining these radiographic evaluations. The result showed that the commonest pathological tubal finding on infertility using Hysterosalpingography evaluations is Bilateral Tubal Occlusion (27.8%) while the commonest pathological uterine findings seen using ultrasound evaluation is Uterine Myoma (24.1%). Predominant age group was 32-37 years. This also showed that there is positive correlation between Age and Infertility type.

Keywords: Hysterosalpingography, Uterine Myoma, Infertility, Radiographic examinations.

INTRODUCTION

Infertility is a disease of the male and female reproductive system defined by a failure to achieve a pregnancy after twelve (12) months or more of regular unprotected sexual intercourse (WHO, 2018; Anwar and Anwar, 2016; Ahmed *et al.*, 2021). Infertility affects approximately 10% of the world's population and has been termed the 5th highest serious global disability by the World Health Organization WHO.

Fertility declines with age in both men and women, but the effects of age are greatly pronounced in women. Women are seen to be half as fertile in their thirties as compared to their twenties and their chances of conception declines significantly after age thirty-five. Males are seen to decline gradually in fertility (American society for reproductive medicine, 2013).

In women, the cause of infertility has been tagged multifactorial due to a range of abnormalities that could occur in the ovaries, uterus, fallopian tubes and hormonal system. Causes of infertility in women may include ovulation disorders, uterine or cervical abnormalities, damaged or blockage of fallopian tubes, endometriosis, primary ovarian insufficiency, pelvic adhesion, cancer etc.

Some studies have shown that uterine cavity abnormalities can be a contributing cause of infertility and recurrent implantation failure hence uterine cavity assessment has been suggested as a routine investigation in the evaluation of infertile women (Pundir and El Toukhy, 2010). Other studies have shown that uterine factors represent only about 2-3% of infertile cases but intra uterine lesions are more

common in infertile women ranging about 40-50% (Benkaddour *et al.*, 2010).

Studies have shown that uterine myoma is the most common gynaecologist tumour in women of reproductive age (Salman and Davis, 2010). It has been described as a lesion presenting as a tumour of muscle tissues that grow in the walls of the uterus (Adedokun *et al.*, 2016). This benign lesion often disrupts the functioning of the uterus causing excessive uterine bleeding and other health conditions (Odigie and Atoigwe, 2017). Uterine myoma has been identified as the fifth most commonly diagnosed gynaecological condition in females of the reproductive age (Malcolm *et al.*, 2011).

Hysterosalpingography (HSG) is the radiographic examination of the uterus and fallopian tubes. It's also known as a radiographic examination of the endocervical canals, uterine cavity, and fallopian tube using a radiographic contrast medium. It is mostly utilized in the assessment of infertility. The review of women with a history of recurrent spontaneous abortions, the postoperative evaluation of women who have undergone tubal ligation or reversal of tubal ligation, and the assessment of patients prior to myomectomy are also other indications for HSG. Hysterosalpingography (HSG) is the most common approach for evaluating infertility. It has long been regarded as the gold standard for assessing the fallopian tubes, providing accurate information on their patency and shape. The general configuration of the cavity can also be seen using HSG.

Limitations to hysterosalpingography occur in identifying uterine factors affecting fertility in most findings. Various studies focused on the hysterosalpingogram findings alone in determining the common presentations of infertility amongst reproductive age women. Those previous findings failed at outlining other radiographic examinations such as the ultrasound scans in evaluating findings of infertility.

Ultrasonography is an essential radiographic evaluation in the investigation of female infertility and the management of assisted conception. Ultrasonography produces images of internal organs and other tissues by using high- frequency sound (ultrasound) waves. Sound waves bounce off bodily structures and return to the transducer, which translates the waves into electrical impulses. The pattern of electrical signals is converted into a picture by a computer, which is displayed on a monitor and saved as a digital computer image. There are no x-rays used in ultrasonography, hence there is no radiation exposure. The ultrasound scans give precise description of the outline of the uterus and can capture intramural myoma which isn't easily seen on hysterosalpingogram scans hence the importance of combining these radiographic evaluations.

Odigie and Erameh, (2018) revealed that menstrual abnormalities (17%) account for the most common clinical manifestation hindering fertility in private health facilities in Benin City. They also reported the mean recorded age for uterine fibroid in the study population as 40.66 ± 0.55.

Some studies among females in Tikrit City of Iraq reported 53.39% (80) had PCOS, while tubal causes accounted for 15 (1%). Also uterine and cervical causes were responsible for 7.4% of infertility and unexplained causes 6% of infertility (Al-Mahmood and Al-Ajeely, 2020).

Researches on HSG in Calabar have shown that majority (81.6%) of the patients had one or more induced abortions and that (35.6%) had normal HSG findings while 25.3% presented with tubal blockage and hydrosalpinx. Also, 13.8% presented with a combination of tubal blockage and hydrosalpinx and the high rate of tubal abnormalities was attributed to post abortions sepsis, puerperal sepsis and/or sexually transmitted infections (Ukweh *et al.*, 2019).

Hysterosalpingogram findings possess limitations in identifying some uterine abnormalities like intramural myoma, hence there is need of ultrasound evaluations to amplify findings in each patient. This therefore is a study on the uterine and tubal findings of infertile women in the reproductive age group using combined radiological technology which are Hysterosalpingography and Ultrasound Scans.

RESEARCH METHODOLOGY

This is a cross sectional descriptive study that was carried out from October 2021 to January 2022. Data was obtained from the Department of Radiology in Rivers State University Teaching Hospital. It involved collection of data such as age, primary or secondary infertility, ultrasound findings and hysterosalpingography findings for each patient.

Sample collection consisted of detailed documentation of patients booked for hysterosalpingogram examination. Results of ultrasound and hysterosalpingogram findings were documented.

A total of 54 patients were recruited for this study.

Area of Study

This study was carried out in Rivers State University Teaching Hospital RSUTH, Port Harcourt, Rivers State.

Target Population

This includes all the booked patients for Hysterosalpingogram and Ultrasound examination at Rivers State University Teaching Hospital from October, 2021 to January, 2022.

Population Size

This study involved 54 patient's records.

Sample size was determined using the Andrew Fisher's Formula below:
n= Z^2 * P(1-P) / D^2

Sample size = $(\text{Z-score})^2 \times \text{Standard Deviation} \times (1\text{-Standard Deviation})$ / $(\text{Margin of Error})^2$

Where;
n= desired sample or sample size
P = Standard Deviation which was 727
D= Margin of error 10%
Z= Confidence level 90% (1.645)
n= 1.645^2 * 0.727(1-0.727) /0.1^2
n= 0.536/0.01
n= 53.6

Inclusion Criteria

i. Female subjects who visited radiology department at the time of study.
ii. Female subjects within the reproductive age group (Pre-menopausal women).
iii. Subjects with both Ultrasounds scan reports and Hysterosalpingography reports.

Exclusion Criteria

i. Those whose age groups were not known at the time of study.
ii. Subjects who didn't have both ultrasounds scan and Hysterosalpingography scans done on them to determine cause.

Procedure of Data Collection

The data will be collected from the radiological reports of patients at the Rivers State University Teaching Hospital, Port Harcourt, Rivers State. The information that will be obtained from the report includes: Patients Age, Diagnosis and Infertility Type.

Data Analysis

Data analysis will be done with computer software package (SPSS version 25.0). Descriptive statistics showing the frequencies, arithmetic mean, standard deviation and range will also be calculated and used to examine the data as appreciate.

RESULTS

This chapter shows the data analysis and graphical representation of the data collected during this research. Inferential comments on observation from the presentation of data can be seen.

Table I: Distribution based on infertility type

Type of Infertility	Frequency (100%)
Primary Infertility	24 (44.4)
Secondary Infertility	30 (55.5)
Total	**54 (100.0)**

Table II: Tubal findings in infertile reproductive aged women using HSG evaluation

HSG Findings	Frequency (%)
Bilateral tubal occlusion	15 (27.8)
Bilateral tubal patency	14 (25.9)
Bilateral fimbrial adhesion	4 (7.4)
Hydrosalpinges and uterine myoma	2 (3.7)
Partial tubal patency	5 (9.3)
Unilateral fimbrial adhesion	2 (3.7)
Unilateral hydrosalpinx	3 (5.6)
Unilateral tubal occlusion	8 (14.8)
Vaginal prolapse	1 (1.9)
Total	**54 (100.0)**

HSG - Hysterosalpingography

Table III: Uterine findings in infertile reproductive aged women using USS findings

USS Findings	Frequency (%)
Huge uterine myoma	2 (3.7)
Multiple huge myoma	4 (7.4)
Multiple uterine myoma	3 (5.6)
Normal uterus	32 (59.3)
Uterine myoma	13 (24.1)
Total	**54 (100.0)**

USS- Ultrasonography

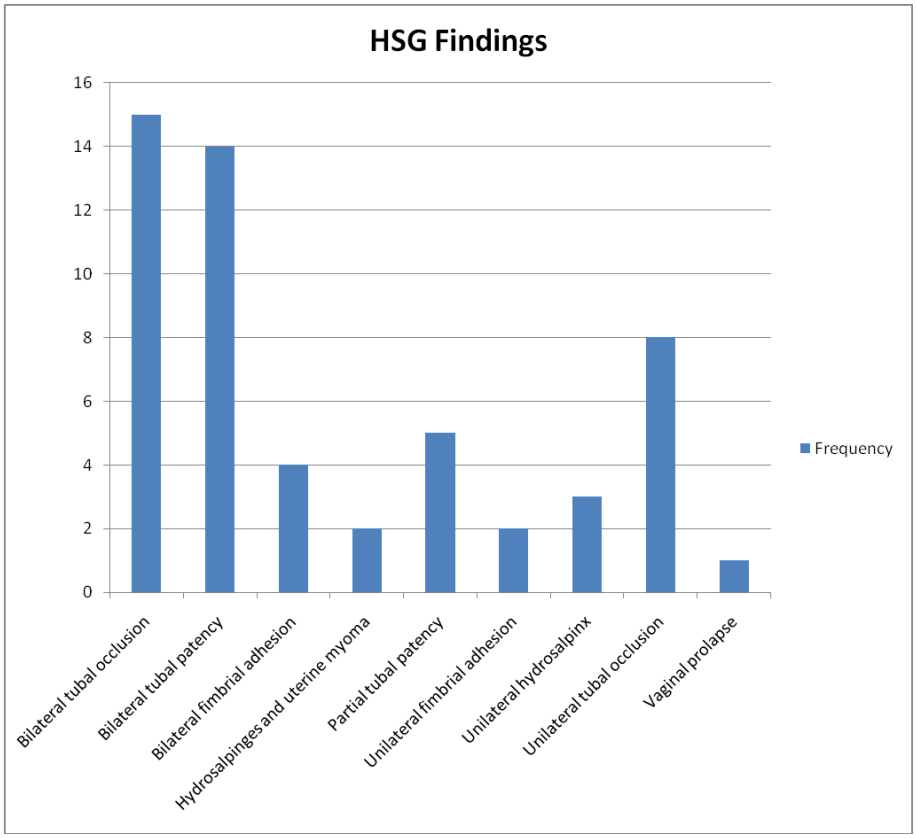

Figure I: Graphical representation of the frequency distribution of tubal findings in infertile reproductive aged women using HSG evaluations

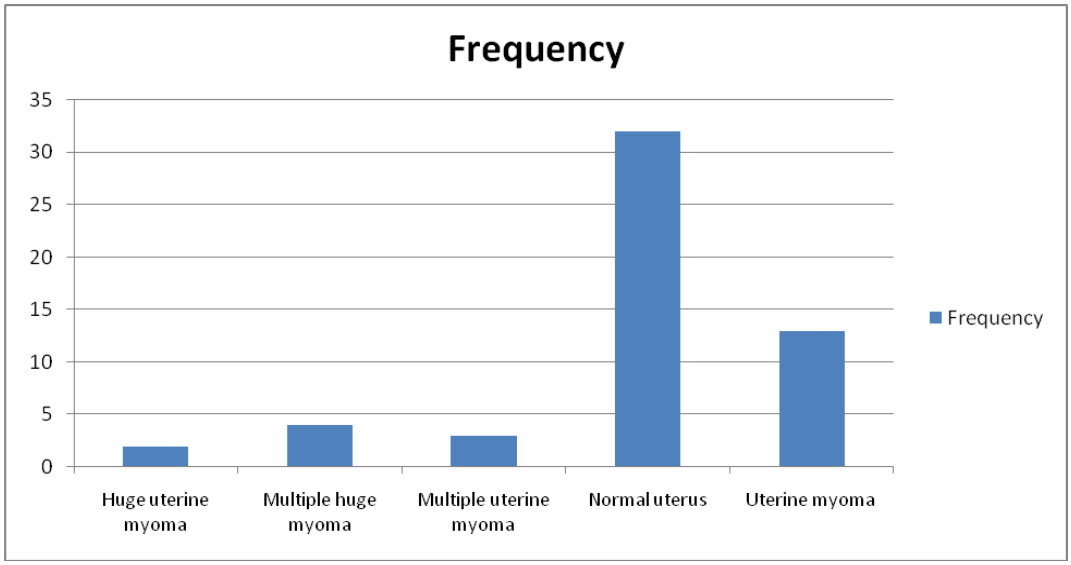

Figure II: Graphical representation of the frequency distribution of uterine findings in infertile reproductive aged women using USS evaluations

Table IV: Result of correlation analysis between variables

	Age	Type of infertility	HSG findings	USS findings
Age	-	0.124	-0.273*	-0.143
Type of infertility	0.124	-	-0.147	-0.030
HSG findings	-0.273*	-0.147	-	-0.164
USS findings	-0.143	-0.030	-0.164	-

*Correlation is significant at the 0.05 level (2-tailed)

DISCUSSIONS

The result of this research shows that the common pathologies detected by the hysterosalpingogram include; bilateral tubal occlusion (27.8%), unilateral tubal occlusion (14.8%), partial tubal patency (9.3%), bilateral fimbrial adhesion (7.4%), unilateral hydrosalpinx (5.6%), unilateral fimbrial adhesion (3.7%), hydrosalpinges and uterine myoma (3.7%), vaginal prolapse (1.9%).

This is in correspondence with the research carried out by Yewebdar, (2011) whose findings showed that of the 331 patients, 70 (21.2%) of the women had normal bilateral fallopian tubes and the remaining 261 (78.9%) had abnormal tubal findings. Out of the 261 abnormal findings, 167 (50.5%) revealed proximal tubal blockage, of which 91 (27.5%) were bilateral and 76 (22.98 %) unilateral blockage. From among the 94 (28.3%) women who belong to the abnormal cluster, 12 (3.6%) exhibit distal tubal blockage with or without hydrosalpinges due to fimbrial blockage. The rest 82 (24.8%) women of the 94 displayed both proximal and distal tubal blockage with or without hydrosalpinges. Bilateral hydrosalpinges are found to be double the unilateral hydrosalpinges. This result also aligns with the results of Ibekwe, (2010) and Poonam, (2007) who stated that tubal blockage was a common finding of infertility using HSG evaluations.

This result shows that bilateral tubal occlusion is the commonest pathology responsible for primary and secondary infertility among women in their reproductive age group using hysterosalpingography findings. This is in line with Daniel and Yewebdar, (2011) that revealed out of the 261 abnormal findings, 167 (50.5%) revealed proximal tubal blockage, of which 91 (27.5%) were bilateral and 76 (22.98 %) unilateral blockage.

The result also showed that the common pathological uterine findings of ultrasound evaluation were Uterine myoma (24.1%), multiple huge myoma (7.4%), multiple uterine myoma (5.6%), huge uterine myoma (3.7%). This is in line with Cramer, (1990) and Ezzati *et al.,* (2009) that shows that 35 -77% of reproductive age women come down with uterine myoma.

The result also showed that secondary infertility (55.6%) rates higher than primary infertility (44.4%) and the prevalence of infertility are highly seen in women in the age group 32-37. This is in line Ramadhan, (2011) who reveal that common pathologies in HSG were found between age group of 30-35 years. Daniel and Yewebdar, (2011) reported that common pathologies in HSG were between age group 33-37 years.

From the present study a positive correlation was observed between age and infertility type.

From this study, bilateral tubal blockage and uterine myoma are seen to be the major uterine and tubal findings of infertility among infertile women in the reproductive age group presenting at the radiologic department of Rivers State University Teaching Hospital. This was also seen to be habitual amongst women in their mid-premenopausal age. Hence, combination of radiologic evaluation methods is needed to get precise diagnosis due to the limitations each radiologic instrument posses.

CONCLUSION

From this study, Bilateral tubal blockage and Uterine myoma are seen to be the major uterine and tubal findings of infertility among infertile women in the reproductive age group presenting at the radiologic department of Rivers State University Teaching Hospital. This was also seen to be habitual amongst women in their mid-premenopausal age. Hence, combination of radiologic 16 evaluation methods is needed to get precise diagnosis due to the limitations each radiologic instrument posses.

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