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RADIOLOGICAL ASSESSMENT OF THE UTERUS AND FALLOPIAN TUBES IN INFERTILE WOMEN AT ABAKALIKI, NIGERIA.

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ABSTRACT
Objectives: This study is aimed at determining the pattern of abnormalities in the Hysterosalpingograms of patients who attended the Radiology Unit of Ebonyi State University Teaching Hospital, Abakaliki.

Method: The 188 hysterosalpingograms conducted between January 2002 to December 2005 were analysed.

Results: The mean age in this study was 31years. Forty-one (21.8%) Hysterosalpingograms were normal. Abnormality of the Fallopian tubes constituted 54.6% of all abnormalities recorded, uterine 33.6% and cervical 11.8%. Cornual occlusion and hydrosalpinx were the leading abnormalities of the Fallopian tube, 32.2% and 20.3% respectively, while beading of the Fallopian tubes was the least tubal abnormality recorded in 1.4%.
Uterine fibroid was the leading uterine abnormality in the study (44.5%), and uterine unicornis unicollis and bicornuate uterus were the least abnormalities of the uterus recorded with 0.8% respectively.
Cervical synechiae was the only cervical abnormality recorded in the study (11.8%).

Conclusion: Hysterosalpingogram is relevant in outlining abnormalities of the fallopian tube and uterus especially in patients with infertility. The study suggests that abnormalities of the Fallopian tube are probably still a prominent contributor to infertility in our community.

KeyWords: Hysterosalpingogram, abnormality, infertility. *(Accepted 22 May 2007)*

INTRODUCTION
Hysterosalpingography (HSG) is a radiological examination of the cervix, uterus and the fallopian tubes that involves the injection of contrast media through the cervix for the purpose of outlining the uterine cavity and the fallopian tubes.
It is a useful tool in the diagnosis of abnormalities of the cervix, uterus and fallopian tubes like cervical incompetence, uterine synechiae, endometrial polyp, uterine submucous fibroid, salpingitis isthmica nodosa, tubal blockage, hydrosalpinx and other tubal abnormalities.
Infertility is probably the commonest indication for HSG,[1] other less common indications include secondary amenorrhoea, recurrent abortion, monitoring the effect of tubal surgery. In patients with infertility, HSG has been reported to be therapeutic in some cases of infertility with opening of the fallopian tubes after the procedure.[2] Pregnancy rate of 30% following HSG have been reported.[3]
This article reviews the pattern of HSG abnormalities among women with infertility attending the radiology unit of Ebonyi State University Teaching Hospital from January 2002 to December 2005.

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MATERIALS AND METHODS
This study, conducted in December 2005 at Ebonyi State University Teaching Hospital, Abakaliki with the objective of establishing the pattern of HSG abnormalities among women with infertility attending the radiology centre of Ebonyi State University Teaching Hospital from January 2002 to December 2005. All HSG conducted in women with infertility from January 2002 to December 2005 were retrieved from the departmental library, reviewed and the abnormalities were recorded. The diagnosis of cervical synechiae was made in some films with filling defect within the cervical canal. The hospital is a 300-bedded tertiary centre and the Department of Radiology has 3 consultants and 2 resident doctors and other supporting technical staff. It is located in the GRA part of Abakaliki metropolis, the capital of Ebonyi State, and serves as a referral centre for the state and adjoining states in the Eastern region of Nigeria.

RESULTS
One hundred and eighty-eight HSG were conducted during the study period and 75(39.9%) was performed on account of primary infertility while 113(60.1%) was conducted for secondary infertility.

Forty-one (21.8%) HSG were normal. Eighteen (24.0%) out of the 75 HSG conducted for patients with primary infertility were normal while 23(20.4%) of the HSG conducted for patients with secondary infertility were normal.

The age range of the patients was 20 years to 40 years with a mean age of 31.2.years. Nine (4.8%) patients were 20-24years, 47(25%) patients were 25-29 years. Majority, 77(41.0%) of the patients were 30-34years, 20 patients (10.6%) were 35-39, 10 (5.3%) patients were = 40years, while in 25 (13.3%) patients, the ages were not indicated in the records.

The data show that 28 patients (37.3%) with primary infertility were below the age of 30years while 28(24.8%) out of 113 patients with secondary infertility were below the age of 30years. (Table 1) (X^2=3.40 ; p=0.065).

Pattern of HSG Abnormalities

One hundred and forty-three (54.6%) abnormalities observed in the study were of the Fallopian tubes while 88(33.6%) were uterine and 31(11.8%) were cervical abnormalities.

Majority of the patients with primary infertility had Fallopian tubal abnormalities, 61(53.0%), while uterine and cervical abnormalities were 46(40.0%) and 11(9.6%) respectively. Eighty-two (55.8%) Fallopian tubal abnormalities were reported in patients with secondary infertility, while 45(30.6%) uterine and 20(13.6%) cervical abnormalities were also reported. (Table2) The observed differences were not statistically significant (X2 =1.24 ; 2df; p=0.0539)

Sites of Fallopian Tubal Abnormalities

Table 3 show cornual occlusion to be the leading site of Fallopian tubal pathology, 46 patients (32.2%), hydrosalpinx was the second leading abnormality of the Fallopian tube, 29(20.3%), while ampullary occlusion 17(11.9%) was the third leading Fallopian tubal abnormality. Other Fallopian tubal abnormalities documented in this study were peritubal adhesion 16(11.2%), perifimbrial adhesion with a loculated spill 12(8.4%), perifrimbrial occlusion12(8.4%), isthmic occlusion 9(6.3%) and beading of the Fallopian tubes, 2(1.4%)

Pattern of Uterine/ Cervical Abnormalities

Table 4 show that uterine fibroid was the leading uterine abnormality and also the leading abnormality on HSG in the study 53(44.5%).. Other abnormalities of the uterus observed were, uterine synechiae 27(22.7%), arcuate deformity 6(5.0%), bicornuate unicollis 1(0.8%), and unicornis unicollis 1(0.8%).

The only cervical abnormality observed was cervical synechiae, and it constituted 31(26.1%) of overall uterine abnormality.

Relationships of abnormalities to age

Table 5 show that in patients with primary infertility there was a peak of abnormalities on HSG in patients between the ages of 30-34years (32.2%), closely followed by those within the ages of 25-29years (29.6%). While in patients with secondary infertility there was a peak of abnormalities in HSG within the ages of 30-34 years (41.5%).

Table 1: **Age Distribution vs Type of Infertility**

Age(yrs)	Primary infertility	Secondary infertility	Total
	No (%)	*No (%)*	*No (%)*
20-24	3(4)	6(5.3)	9(4.8)
25-29	25(33.3)	22(19.5)	47(25.0)
30-34	29(38.7)	48(40.7)	77(41.0)
35-39	6(8.0)	14(12.4)	20(10.6)
?40	2(2.7)	8(7.1)	10 (5.3)
Not indicated	10(13.3)	15(13.3)	25(13.3)
Total	**75(100)**	**113(100)**	**188(100)**

Table 2: **Pattern of HSG Abnormality**

	Cervical	Uterine	Tubal	Total	Normal
	No (%)	No (%)	No (%)	No (%)	No (%)
Type					
Primary Infertility	11(9.8)	41(36.6)	60(53.6)	112(100)	18(13.9)
Secondary Infertility	20(13.3)	47(31.3)	83(55.3)	150(99.9)	23(13.3)
Total	31(11.8)	88(33.6)	143(54.6)	262(100)	41(15.7)

Table 3: **Sites of Tubal Abnormalities**

	Right tube only	Left tube only	Bilateral	Total
Sites	NO (%)	NO (%)	NO (%)	NO (%)
Cornual	4(12.1)	9(25.7)	33(44.0)	46(32.2)
Hydrosalpinx	10(30.3)	7(20.0)	12(16.0)	29(20.3)
Perifrimbrial occlusion	2(6.1)	3(8.6)	7(9.3)	12(8.4)
Ampullary occlusion	5(15.2)	8(22.9)	4(5.3)	17(11.9)
Peritubal adhesions	5(15.2)	3(8.6)	8(10.7)	16(11.2)
Perifrimbrial adhesions with loculated spill	4(12.1)	2(5.7)	6(8.0)	12(8.4)
Isthmic occlusion	2(6.1)	2(5.7)	5(7.0)	9(6.3)
Beading	1(3.0)	1(2.9)	0(0.0)	2(1.4)
Total	**33(23.1)**	**35(24.5)**	**75(52.2)**	**143(100)**

Table 4: **Age Distribution vs Uterine Abnormalities**

	Fibroid	*Cervical synechiae*	*Uterine synechiae*	*Arcuate Deformity*	*Unicornis unicollis*	*Bicornuate unicollis*	*Total*
Age (yrs)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
20-24	2	4	2	2	0	0	10
25-29	8	4	7	0	1	0	20
30-34	20	12	10	3	0	1	46
35-39	6	4	2	0	0	0	12
?40	6	3	1	0	0	0	10
NI	11	4	5	1	0	0	21
Total	**53(44.5)**	**31(26.1)**	**27(22.7)**	**6(5.0%)**	**1(0.8%)**	**1(0.8%)**	**119(99.9)**

Discussion

During the study, virtually all the HSG conducted were for infertility, 60% for secondary infertility and 40% for primary infertility. This is not surprising as most of the indications for HSG even in centres where laproscopy is in existence borders mainly on infertility.

The mean age of 31years reported for the patients in this study is higher than that reported in other earlier series [4,5] conducted about two decades ago. It is tempting to suggest here that our women may currently be marrying late and that this may partly be attributable to the current emphasis on female education in Nigeria.

Abnormality of the Fallopian tubes was the leading abnormality recorded in this study. It constituted 54.6% of all abnormalities, this figure is midway between the 46.7% reported from Ibadan[6] and 64.6% reported from Benin [5] and it is also lower than the 48.6% reported from Ilorin. The rather high incidence of Fallopian tubal abnormality in this study further emphasizes the significance of tubal factor in patients with infertility and the need to guard against tubal damage in women of reproductive age. There was no difference in the incidence of Fallopian tubal abnormality in patients with primary when compared with those with secondary infertility. This finding was not surprising since both group of patients were married.

The incidence of tubal abnormalities was similar in both Fallopian tubes, though it was expected that right Fallopian tubal abnormality should have been commoner than the left as was reported in a similar study.[7]

Cornual occlusion accounted for close to a third of all Fallopian tubal abnormalities reported in this study. Some other similar study[8] has also documented cornual occlusion as the leading site of Fallopian tubal abnormality. The left fallopian tube showed a significantly higher proportion of cornual occlusion than the right fallopian tube and this observation is a curious one. Bilateral tubal occlusion was significantly higher than occlusions involving the right and left Fallopian tubes. Bilateral cornual occlusion may occasionally falsely result from tubal spasm and a study from Nnewi,[8] Eastern Nigeria highlighted the false positive cornual occlusion from HSG. Beading is the least common abnormality of the Fallopian tube observed, with an incidence of 1.4%, which is close to the 0..9% reported from Ilorin.[7]

Hydrosalpinx was another significant Fallopian tubal abnormality observed in this study and it may follow pelvic inflammatory disease. The incidence of 11% reported for hydrosalpinx is similar to the 7.2% reported from Enugu,[9] close to 20% reported from Benin[5] and quite distant from the 33.1% reported from Ilorin.[7] The contribution of Right hydrosalpinx

is this study was significantly higher than left hydrosalpinx, this observation is in keeping with earlier reports.[7] The theory of the contribution of inflamed appendix causing more tubal pathology on the right side than the left may probably shed more light to why right perifrimbrial adhesions were more than left in this study. It may be that the inflamed appendix may initiate a pelvic infection and contribute to adhesion formation especially around the frimbrial end of the Fallopian tube where it is occasionally a close relation.

The contribution of uterine abnormality to the overall abnormalities on HSG was higher in patients with primary infertility than those with secondary infertility and this was because of the higher incidence of uterine fibroid in patients with primary infertility. Uterine fibroid was the single commonest abnormality recorded in this study and the incidence of 20% reported in this study is similar to the incidence of 13.5% and 16.5% reported Enugu[9] and Burkina Faso[10] respectively and almost triple the 7.2% reported from Benin.[5] Expectedly the incidence of fibroid in patients with primary infertility in this study was almost double that of patients with secondary infertility. This finding is in keeping with the established fact that fibroid are commoner in nulliparous than multiparous patients.

The contribution of cervical and uterine synechiae was higher than was expected. While both could result from other causes like previous pelvic surgery, dilation and curettage is by far a more common cause. This unexpectedly high incidence in this study especially in patients with primary infertility raises the question as to how many of the patients with primary infertility were actually having primary infertility. For fear of marital disharmony, some patients with primary infertility tend to without the history of previous premarital termination of pregnancy, and so several multigravidae may want to pass as nulliparous patients in order to save their marriages.

The contribution of congenital malformation in this study was expectedly low, this is consistent with earlier reports[7,11,12,.] The significance of congenital malformation of the uterus is because of it's association with infertility, recurrent abortion, ectopic pregnancy and other pregnancy complications. Acruate deformity of the uterus was found in both patients with primary and secondary infertility and this condition is compatible with normal pregnancy and delivery.

In about a fifth, the HSG studied were normal, this is between the 29.8% and 15.5% reported from Ilorin[7] and Ibadan[13] respectively for normal HSG and differs significantly from the 45% reported from Enugu.[9] The reason for this wide variation may be because of the retrospective nature of this study. In the literature, prospective studies have had a significantly higher number of normal HSG than retrospective studies.[5,7,9,13,] This is due to the fact that in prospective work some measures are adopted to reduce the influence of factors that may be associated with tubal spasm, like the use of vacuum uterine cannula which may cause less pain and less tubal spasm.

In conclusion, the unacceptably high incidence of tubal abnormality highlighted in this study calls for more measures for the prevention of Sexually transmitted infections in the community, adequate and prompt treatment of young women with Pelvic inflammatory disease. While the controversy about the place of HSG and laproscopy in the management of infertility will continue, HSG evidently can provide useful information about the Fallopian tubes and the uterus.

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