

## Original Article

# Cervical abnormalities seen at hysterosalpingogram of infertile women in Jos, North Central Nigeria

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## Abstract

**Background:** Infertility is a major health problem in Nigeria and commonly results from complications of genital tract infections. Abnormalities of the cervix and its secretions are known significant factors in infertility in women. This study is aimed at determining the pattern of cervical abnormalities detected in cervicograms (CVGs) and assessed the value of the study in evaluation of infertile women in North Central Nigeria.

**Materials and Methods:** Hysterosalpingograms (HSGs) and radiology report of 998 consecutive infertile women who had HSG over 10-year period at Jos University Teaching Hospital, Jos were retrieved and reviewed retrospectively, with particular attention to the cervicohysterograms. The data were analyzed using descriptive statistics with Excel 2010.

**Results:** The women were aged 15-44 years, 4.4% of them were teenagers. Women with secondary infertility were more than those with primary infertility (59% vs. 41%). Cervical abnormalities were seen in 12.6% of the women. Complication rate for HSG was 8.5%.

**Conclusion:** Infection-related cervical disorders were the most common abnormalities seen on the CVGs of women with infertility in this environment. Attention to CVG at HSG, therefore, can give clue to cervical factor in infertility.

**Key words:** Cervical disorders, hysterosalpingography, infertile women

## Introduction

In Nigeria, infertility remains a major health problem with distressing psychosocial strain to the couple and emotional and physical repercussion for the woman. It is the most common reason for gynecological consultation in this country.<sup>[1]</sup> Its impact on lives of affected couple is profound. The uterine cervix plays a crucial role in human reproduction serving as storage depot, filter, and allowing passage of normal motile spermatozoa to the upper genital tract. The first stage of capacitation is thought to occur in the cervical crypts.<sup>[2]</sup> Malfunction of the cervix with respect to any of the above roles can result to female infertility

or childlessness. This malfunction may be as result of cervicitis, poor mucus secretions, scarring of cervical canal, cervical incompetence, benign cervical tumours, fistulae, and congenital anomalies. The incidence of the above cervical disorders is unknown,<sup>[3]</sup> but abnormalities of the cervix and its secretions are known to be responsible for infertility in approximately 5%–10% of women.<sup>[4]</sup> Chronic cervicitis has been incriminated in infertility. Infertility from genital tract infections was clearly related to a woman's history of sexually transmitted disease, pelvic inflammatory disease, pregnancy complications, and other infectious disease conditions such as tuberculosis. African region has the highest rate of infections related infertility, more than threefold compared to other regions.<sup>[5]</sup>

The HSG is a screening procedure that gives the initial clue to the possibility of a uterine anomaly and is routinely performed on women evaluated for infertility at Jos University Teaching Hospital (JUTH), Jos, Nigeria.

An understanding of the role of the cervix in female reproduction has changed the way HSG is done. In order

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to visualize the cervix, various types of cannulae have been developed and used. The Ruben's cannula has been so far the best in visualizing the cervical canal. It is the cannula routinely used for HSG in our center. Yet the literature is sparse particularly in this country with information on the cervicogram (CVG) at HSG. This study is aimed at determining the pattern of cervical abnormalities detected at CVGs among infertile women investigated at JUTH in North Central Nigeria and assessed the value of the study in evaluation of infertile women.

## Materials and Methods

A retrospective study was carried out in a teaching hospital with limited facilities for evaluation of infertile couple. Hysterosalpingograms (HSGs) and radiology reports for 1,026 consecutive infertile women who underwent HSG between July 1988 and June 1998 (10 years) at JUTH were retrieved and reviewed with particular attention to the cervicohysterogram. All the patients had complained of inability to conceive for a period of at least 12 months. The timing of the study was usually between the 7<sup>th</sup> and 10<sup>th</sup> days of the menstrual cycle. A standard format for the recording of the HSG findings and other personal data of infertile women was completed for every case. The data were analyzed using descriptive statistics with Excel 2010. The ethics committee of the hospital approved the study.

## Results

### Subjects and Type of Infertility

In total, 1,026 CVGs of hysterosalpingography were available for this study, but only 998 (97.3%) met the inclusion criteria. The CVGs of 28 (2.0.7%) women were excluded because of failed procedure and poor film qualities.

Of the 998 corresponding CVGs, 389 (39.0%) and 609 (61.0%) were those of the patients who presented with primary and secondary infertility, respectively.

The age of the women ranged from 15 to 44 years with a mean of 29.5 year [Table 1]. In each age group, secondary infertility was more prevalent than primary infertility. A total of 294 patients (29.5%) were below the age of 25 years, 567 (56.8%) were aged 25-34 years, and 137 (13.7%) were above the age of 34 years. There were 44 (4.4%) teenage girls.

### Analysis of the Cervicograms

Table 2 shows the details of cervical findings. The CVGs of 823 patients (83.0%) were normal, while that of 126 (12.6%) showed radiographic evidence of various abnormalities. Among the cervical abnormalities, features suggestive of chronic cervicitis were seen in 54.0% (68/126), while features suggestive of cervical incompetence were observed in 20.6% (26/126). Radiological features of

**Table 1: Age distribution of the infertile women (n=998)**

Age	Primary infertility (n=389 (%))	Secondary infertility (n=609 (%))	Total (n=998(%))
15-19	23 (5.9)	21 (3.4)	44 (4.4)
20-24	94 (24.2)	156 (25.6)	250 (25.1)
25-29	164 (42.2)	255 (41.9)	419 (42.0)
30-34	56 (14.4)	92 (15.1)	148 (14.8)
35-39	46 (11.8)	74 (12.2)	120 (12.0)
40-44	6 (1.5)	11 (1.8)	17 (1.7)
Total	389 (100)	609 (100)	998 (100)

**Table 2: Distribution of the cervical abnormalities detected by cervicograms in the infertile Nigerian women by type of infertility (n=998)**

Diagnosis	Primary infertility (n=389 (%))	Secondary infertility (n=609 (%))	Total (n=998 (%))
Cervix not seen	17 (4.3)	32 (5.3)	49 (4.9)
Normal findings	333 (86.1)	490 (80.9)	823 (82.5)
Abnormal findings	39 (9.5)	87 (13.8)	126 (12.6)
Cervicitis	26 (6.2)	42 (6.4)	68 (6.3)
Incompetence	3 (0.8)	23 (3.8)	26 (2.6)
Stenosis	5 (1.3)	8 (1.3)	13 (1.3)
Fistula	1 (0.3)	14 (2.3)	15 (1.5)
Double cervices	4 (1.0)	0 (0.0)	4 (0.4)
Total	389 (100)	609 (100)	998 (100)

cervical incompetence were more common in women with secondary infertility 23 (3.8%) than those with primary infertility 3 (0.8%). Similarly, cervical fistulae were seen more in patients with secondary infertility than those with primary infertility (2.3% vs. 0.3%). The only significant congenital abnormality of the cervix seen in this data-double cervices, occurred in 4 (0.4%) women, and only in those with primary infertility.

## Discussion

The study showed that infection-related cervical disorders were the most common abnormalities of the cervix uteri in the CVGs of the study population. The CVGs of 126 (12.6%) women showed radiographic evidence of various cervical abnormalities that are significant enough to cause infertility/childlessness in the women.

The type of infertility and age distribution of the subject in this study are similar to that observed by other workers.<sup>[6-8]</sup> The majority of the women were within the ages 25-34 categories in both types of infertility. The age and infertility type distribution is a reflection of the overall population of the gynaecological patients attending the clinics.<sup>[9]</sup> That notwithstanding, the study also showed desire for children even among teenage girls (4.4%), in contrast to the findings from Eastern Nigeria, where none of their subjects were below the age of 20 years.<sup>[8,9]</sup> This indicates a regional diversity in

age at marriage in Nigeria and desire for childbearing among the younger population in Northern part of the country.<sup>[10]</sup>

The finding of 126 (12.6%) abnormal CVGs that can represent abnormalities of the cervix and its secretions among the study group was slightly higher than the generally quoted rate of 5-10,<sup>[7,9]</sup> similar to the findings from Abakaliki, South-eastern Nigeria<sup>[9]</sup>, but lower than the findings (19%) from Lagos study.<sup>[11]</sup> Majority of the abnormal CVGs (54%) showed radiographic evidence of chronic cervicitis. Chronic cervicitis has been incriminated in infertility.<sup>[4]</sup> This center had earlier reported a prevalence of 8.9% of gonorrhea among gynecological patients,<sup>[12]</sup> to support the above findings. Other studies have equally shown high prevalence of cervical infection among the infertile women.<sup>[13]</sup>

There are several ways that chronic cervicitis is presumed to cause infertility. Beside injury to the delicate mucosa of the endocervical canal, the colonizing micro flora also compete with spermatozoa in consumption of the energy yielding micronutrients of the cervical mucus.<sup>[4]</sup> Certain bacteria such as *Escherichia coli*, alpha hemolytic streptococci (*Streptococcus haemolyticus*) *Streptococcus haemolyticus*, *aerobacters*, and others are believed to have spermicidal properties impeding sperm access to the upper genital tract.<sup>[4]</sup> Treatment of chronic cervicitis significantly increased the subsequent chance of the women to conceive giving support to this assertion.

The CVG of 54 (5.4%) women showed abnormalities suggestive of surgical trauma to the uterine cervix and most of them (4.5% vs. 0.9%) presented with secondary infertility as compared with those with primary infertility. These abnormalities included dilated isthmogram, filling defect/stenosis and fistulous tracts. A dilated lower uterine segment at isthmogram suggestive of cervical incompetence was seen in 2.6% of the subjects. This is lower than the prevalence of 3%-6% shown by studies from South-West Nigeria<sup>[14]</sup> but similar to a previous study in this center.<sup>[6]</sup> Thirteen women (1.3%) had CVG showing persistent filling defects and stenosis of the cervical canal suggestive of severe scarring, much in contrast to the findings from studies elsewhere in this country.<sup>[9,12]</sup> The *sine qua non* of intrauterine adhesion is uterine trauma.<sup>[3]</sup> Scarring could be as result of surgical or infective injury of the endocervical canal. Surgical injury may be from forceful dilatation of the cervical canal at termination of pregnancy, dilatation and curettage in the treatment of dysmenorrhea or investigation of infertility, and treatment of premalignant lesions of the cervix. Unsafe abortion is reported to be common in this country<sup>[15]</sup> and implicated as a cause of infertility.<sup>[16]</sup> Kralj and Lavric cited by Buttram and Reiter<sup>[3]</sup> found synechia

detected by HSG in the cervix in 27 of 275 patients (10%), following elective abortion.

A chronic infection with high potential for scarring is genital tuberculosis<sup>[3]</sup> and several studies in this country and other developing countries showed high prevalence of pelvic tuberculosis.<sup>[17,18]</sup> Cervical scarring can cause infertility from direct mechanical obstruction of sperm transport or production of mucus of poor quality that can impair sperm transport.<sup>[3]</sup>

Urinary and fecal female genital fistulae are common in our environment,<sup>[19]</sup> but the literature is sparse with cervical fistulae that do not leak urine or feces. Seetesh *et al.*,<sup>[20]</sup> reported a case of unusual cervical fistula that developed following a septic abortion. Fistula involving the cervix is usually a result of abortion, postpartum, or postoperative complications. Smayra and Ghossain<sup>[21]</sup> highlighted the challenge with the diagnosis of cervical fistula in their case series. The finding of 12% CVG suggestive of cervical fistula among the abnormal CVG is a pointer that the problem is common but either neglected or poses diagnostic challenge among our infertile women.

Congenital abnormality of the cervix (double cervixes) was seen in 0.4% of the study groups and only in women with primary infertility. This is much lower than the 0.8% (2/250) reported from Lagos.<sup>[11]</sup> Congenital malformations of the genital tract are very uncommon, particularly that involving the uterine cervix. They are so rare that only case reports and small series are reported in the literature. In their literature review of the subject, Rock *et al.*,<sup>[22]</sup> reported on 30 cases over 69 years from six institutions in United States of America. Because of the rarity of the anomaly, diagnosis and treatment poses real challenge in patient care and may be the reason for the paucity of reports in the literature on the subject in our environment.

## Conclusion

Our findings have shown that structural cervical abnormalities were relatively common among women with infertility in the study population (12.6%) and infection-related abnormalities accounted for more than half of the cases (54%). The rare genital tract anomaly can also be detected with careful attention to details. HSG is capable of detecting such abnormalities that can significantly affect fertility in women and gives clue to cervical disorders and early evaluation and assessment of cervical factors in the management of infertile woman. This calls for an early consideration of the role of the cervix in the management of the infertile women. A policy of routine screening for genital tract infections among reproductive age group in this environment may greatly ameliorate the problem.

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