

## ORIGINAL RESEARCH ARTICLE

## Do Abnormal Findings on Hystero-Salpingographic Examination Correlate with Intensity of Procedure Associated Pain?

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### Abstract

The aim of this study is to determine if the intensity and nature of pain during Hystero-Salpingography could give a clue to the presence of abnormal finding/s. Eighty-two patients were recruited over a six-month period. Procedural pain was assessed using the numeric rating scale. Mean age was  $33.2 \pm 4.9$  years. The median pain score in patients with normal findings was 6.0 but 7.0, 8.0, and 8.5 in those with right tubal blockade, uterine fibroids and left tubal blockade respectively. No statistical difference in the absolute pain score between patients with normal and abnormal findings. Pain scores in patients with 1 and 2 abnormalities were 7.0 and 7.5, and the number of abnormalities did not affect pain score ( $P = 0.3$ ). The presence or absence of pain during HSG may not be a suitable way of determining the presence or absence of abnormal HSG finding/s. *Afr J Reprod Health 2014; 18[2]: 147-151*.

**Keywords:** Hystero-salpingography; abnormal findings; Pain.

### Résumé

Le but de cette étude est de déterminer si l'intensité et la nature de la douleur pendant l'hystérosalpingographie pourraient donner une indication de la présence des constatation(s) anormale(s). Quarante-deux patients ont été recrutés au cours d'une période de six mois. La douleur de la procédure a été évaluée en utilisant l'échelle d'évaluation numérique. L'âge moyen était de  $33,2 \pm 4,9$  ans. Le score de douleur médiane chez les patients qui présentaient des résultats normaux était de 6,0 but 7,0, 8,0, et 8,5 chez ceux qui présentaient des blocages des trompes droites, les fibromes utérins et des blocages des trompes gauches respectivement. Il n'y avait aucune différence statistique du score de douleur absolue entre les patients avec des résultats normaux et anormaux. Les scores de douleur chez les patients avec 1 et 2 anomalies étaient de 7,0 et 7,5, respectivement et le nombre d'anomalies n'ont pas de conséquence sur le score de douleur ( $p = 0,3$ ). La présence ou l'absence de douleur pendant la HSG peut ne pas être un moyen approprié de déterminer la présence ou l'absence des constatations anormales de la HSG. *Afr J Reprod Health 2014; 18[2]: 147-151*.

**Mots-clés :** hystérosalpingographie, résultats anormaux, douleur.

### Introduction

Hystero-Salpingography (HSG) has remained an important radiological investigation in patients undergoing investigation for infertility and other reproductive tract abnormalities, despite the fact that this procedure is accompanied with pain which at times is unbearable by the patients. Many researchers have proffered different solutions towards alleviating the pain associated with HSG with no success. These include pre-procedure prophylactic paracetamol, intrauterine lidocaine, tramadol and application of lidocaine-prilocaine cream to the cervix before the commencement of

the procedure<sup>1-4</sup>. The pain is often said to be caused by cervical instrumentation, uterine distension with contrast media, and peritoneal irritation as a result of contrast spill into the peritoneal cavity. Also, pain has been found to cause tubal spasm thereby leading to non-spillage of contrast medium into the peritoneum with abrupt termination of contrast column in the fallopian tube seen on HSG being interpreted as spasm or tubal blockage<sup>5</sup>. Though tubal spasm is transient and does not need to be treated, it may be difficult to determine whether the abrupt termination of contrast in the fallopian tube and the associated pain is due to spasm or tubal



pathology. This study seeks to find out if there is any association between the intensity of pain experienced by the patient undergoing HSG examination and HSG findings.

## Methods

The study population was made of eighty-two women who were referred to the Department of Radiology, University College Hospital, Ibadan for HSG during a six month period. All patients were booked for the procedure using the 10-day rule. Before the procedure, all patients were duly and properly counseled by a resident doctor. Thereafter a written informed consent was obtained in keeping with the departmental protocol. Patients were taught how to use the pain measuring tool i.e. the numeric rating scale (NRS), a scale of 0 to 10 for pain self-reporting. All patients that have previously undergone HSG were excluded to eliminate bias.

Under aseptic conditions, the patients were placed in the lithotomy position. The vulva, pubic area and inner parts of both thighs adjoining the *labia majora* were cleaned with antiseptic agent. Having appropriately draped the patients, we passed a Cusco's speculum, identified the cervical Os and held its anterior lip with a pair of tenaculum. An appropriate size of Leech Wilkinson's cannula was inserted through which between 10ml and 50ml of non-ionic contrast (iopamirol) was introduced, depending on the capacity of the uterus. Representative spot films were taken using GE silhouette VR (2004) basic machine with Kv of between 70 and 80 and MAs of 25-32 depending on the patient's size.

At the end of the procedure, using a data collection form the patients were asked to rate the pain during the procedure and also to determine whether the pain they experienced was more, same or less than expected. The HSG images generated were reported by two independent qualified and certified radiologists who were blinded to the patients' pain score. The Kappa agreement between them was 0.96. The data collected were entered and analyzed using SPSS version 15. Results are presented in frequencies, percentages, means, standard deviations and ranges. Two categorical variables were compared using the chi-

square test. Normally distributed continuous variables were compared using Student's t-test for independent groups while the non-parametric equivalent test (Wilcoxon rank-sum) was used to analyze skewed data. Statistical significance was declared at the 5% level using two tailed p-values.

## Results

### Demographic characteristics

A total of 82 patients participated in the study. Fifty (61%) were aged below 35 years, while thirty two (39%) were 35 years and above. The age ranged from 24 years to 43 years with a mean of  $33.2 \pm 4.9$  years.

Those who were married accounted for seventy two (87.8%), and those referred due to secondary infertility were fifty six (68.3%) and about one third (34.1%) of the subjects had no child (Table 1). None of the patients had previously undergone HSG examination.

Table 1: Frequency of background characteristics of the patients

Variable	Frequency	Percentage
<b>Age group</b>		
<35	50	61.0
35 & above	32	39.0
<b>Marital Status</b>		
Single	6	2.4
Married	72	87.8
Not indicated	4	9.8
<b>Parity</b>		
None	28	34.1
At least 1 birth	54	65.9
<b>Reason for Referral</b>		
Primary infertility	24	29.3
Secondary infertility	56	68.3
Secondary infertility + PID	2	2.4
<b>Level of pain</b>		
More	42	51.2
Less	22	26.8
Same	18	22.0
<b>Total</b>	<b>82</b>	<b>100.0</b>

### HSG Findings

Twenty-six (31.7%) patients had their HSG reported as normal, while fifty-six (68.3%) patients had one or more abnormalities reported. Twenty-four and 16 patients had one and two

abnormal HSG findings respectively (Table 2). The commonest abnormality reported was right tubal blockade, in 24 patients. Other abnormalities were uterine fibroid, left tubal blockade and left hydrosalphinx seen in 18, 16 and 14 patients respectively (Table 3). None of the patients had congenital uterine abnormality.

**Table 2.** Frequency of HSG findings and pain score during the procedure

HSG findings	Number of patient N(% of total)	Median pain score (NRS)
Normal	26(31.7)	6.0
1 abnormal finding	24(29.3)	7.0
2 abnormal findings	16(19.5)	7.5
3 or more abnormal findings	16(19.5)	7.0
	82	P = 0.30

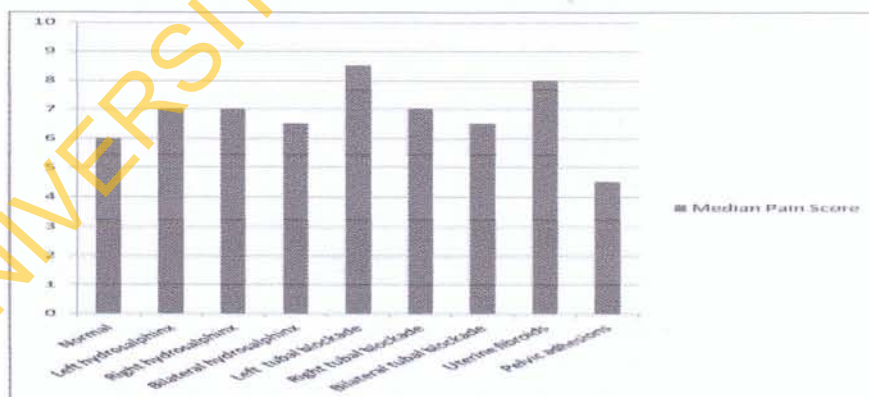
### Expected and Perceived level of pain

Out of a total of twenty-six patients that had normal HSG findings, twelve each felt the perceived pain to be more and less than expected while two patients felt the perceived pain was the same as expected. However, of the twenty four patients who had right tubal blockade, sixteen felt the pain was more, and four each felt the pain was less than and same as expected. Among the sixteen patients who had left tubal blockade, ten felt the pain was more, six felt the pain was same as expected, and none felt the pain was less. However all the eight patients who had bilateral tubal blockade felt the pain was more than expected. (Table 3) In all there was no statistical association between the degree of expected/perceived pain and HSG findings.

**Table 3:** Expected/Perceived pain and HSG findings

Variable	Level of Pain experienced			P-value
	More	Less	Same	
Normal	12(46.1)	12 (46.1)	2 (7.7)	0.521
R.Hydrosalphynx	4(40.0)	0(0.0)	6(60.0)	0.236
L.hydrosalphynx	8(57.1)	4(28.6)	2(14.3)	0.378
Bilateral Hydrosalphynx	4(100.0)	0(0.0)	0(0.0)	0.395
R.tubal blockage	16(66.7)	4(16.7)	4(16.7)	0.342
L.tubal blockage	10(62.5)	0(0.0)	6(37.5)	0.348
Bl.tubal blockage	8(100.0)	0(0.0)	0(0.0)	0.132
Uterine fibroids	10(55.6)	6(33.3)	2(11.1)	0.378
Pelvic adhesion	6(50.0)	4(33.3)	2(16.7)	0.834

\*16 patients had more than one abnormality



**Figure 1:** Median pain score for the different HSG findings



**Absolute pain score during procedure in relation to HSG findings**

The median pain score in patients with normal findings was 6.0, while the median pain scores were 7.0, 8.0, and 8.5 in patients with right tubal blockade, uterine fibroids and left tubal blockade respectively. (Figure 1) Pain scores in patients with 1 and 2 abnormalities were 7.0 and 7.5 respectively. The number of abnormalities does not seem to affect the pain scores,  $P = 0.3$ . (Table 2)

**Discussion**

Infertility in the primary state carries a lot of social stigma on Nigerian women<sup>6</sup>, hence infertile women will go to any length including having painful procedures such as HSG to investigate this condition. HSG is the most cost-effective investigation to study anatomical abnormalities of the uterus and the fallopian tubes; it has a high specificity<sup>7</sup> and reproducibility<sup>8</sup>. Sixty-one percent of the patients were in the child-bearing age of less than thirty five years. This is similar to the 58.7% in a similar study conducted in the south-eastern part of the country<sup>9</sup>, but at variance with the 83.8% and 87.5 % of the same age group<sup>10, 11</sup> in similar studies conducted in the northern parts of the country. This difference might be due to the cultural practice of early marriage in the north when compared with that in southern Nigeria where women are expected to have completed their tertiary education before marriage. The high percentage of married patients in our study (87.4%) and an Ethiopian study (93%)<sup>12</sup> is not unexpected as child-bearing outside wedlock is unusual in both settings. Secondary and primary infertility were reasons for referral in 68.3% and 29.3% respectively. Our findings deviates from that of a study conducted in Northern Nigeria which found that 52.2% and 47.8% of the patients investigated were referred because of secondary and primary infertility respectively<sup>11</sup>. Ours are, however, close to the findings in a study conducted in the southern part where 65% and 35% of the patients were referred on account of secondary and primary infertility respectively<sup>13</sup>. The reason for this difference may be the socio

cultural difference of the two areas. However in all these studies, secondary infertility was more common than primary infertility and these may be due to previous pelvic infection from sexually transmitted disease, septic abortions and previous complicated pregnancies.

Pain during HSG is a well known complication and, a number of alternatives have been developed over the years to replace the conventional HSG such as hystero-salpingo-contrast sonography (HyCoSy) and 3-Dimensional Dynamic MR Hysterosalpingography. Despite these advances, HSG is still the most commonly used procedure to assess the female reproductive tract. Several authors researched on ways of preventing or reducing pain during HSG<sup>14-16</sup>, unfortunately, no single technique or procedure has been found to completely offer this advantage. We wanted to determine if the intensity and nature of pain experienced during HSG could assist in providing a clue to the presence of abnormal findings. There has been conflicting results about the association of tubal occlusion with increased pain<sup>3</sup>, and pain has been associated with possible tubal spasm which can be misinterpreted as tubal blockade<sup>5</sup>. Though we observed that more patients who ended up with an abnormal HSG finding experienced more pain than expected during the procedure, there was no statistical difference in the absolute pain score between patients with normal and abnormal findings; also increasing the number of abnormal findings was not associated with higher pain scores. We are not sure if a different result would have been obtained if the patients were randomized.

In the present study, nulliparity was statistically correlated with a higher pain score. Sohail et al<sup>17</sup> demonstrated in 250 patients undergoing diagnostic HSG with small size Leech Wilkinson cannula, that amenorrhoea was significantly associated with increased pain during the procedure. This is because a component of pain perceived during HSG might be attributed to uterine cavity distension either at balloon inflation or during dye filling; it is feasible that nulliparous patients or patients with long term amenorrhoea share the same mechanism of low tolerance to this procedure. It is expedient to look for ways of alleviating the pain associated with HSG. In a



study by Atalabi and Osinaike<sup>18</sup>, the most painful steps of HSG have been identified and these steps can be targeted in an effort to relieve the pain during HSG procedure.

One can deduce from this study that factors other than HSG findings alone are responsible for pain during HSG and as such presence or absence of pain may not be a suitable way of determining the presence or absence of an abnormal finding. Other factors like apprehension, prolonged procedure time, use of non ionic contrast medium are all variables that have been associated with pain experienced during HSG procedure<sup>17</sup>.

### Contribution of Authors

Omolola M. Atalabi – Study concept and design. Collection of data and manuscript writing.

Babatunde B. Osinaike – Study concept and design. Data analysis and manuscript writing.

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