

## Uterine and Tubal Abnormalities in Infertile Saudi Arabian Women: A Teaching Hospital Experience

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### ABSTRACT

**Background and Objective:** Hysterosalpingography (HSG) is commonly used in the evaluation of the subfertile and infertile women. This study was undertaken to assimilate the findings observed during HSG in Saudi Arabian infertile patients and to find the most common pathology identified by the HSG.

**Patients and Methods:** A retrospective analysis was conducted of subfertile and infertile patients who had undergone HSG between June 2007 and May 2012. Patients' demographic data were collected from the medical records of the King Fahd Hospital of the University, Al Khobar, Saudi Arabia. The data included age, years of marriage, menstrual history either regular or irregular, primary/secondary infertility, hormonal profile, previous infection or pelvic surgery, and diagnostic laparoscopy. Radiographic reports of HSG were collected from the IPAC system and analyzed for fimbrial findings, tubal patency, and cervical and uterine cavity pathology. The data were entered in the database and analyzed using a *t*-test to compare means between the age, type of infertility, different pathologies and for all the parameters assessed. All tests were performed using Statistical Package for the Social Sciences, version 14.0, Chicago, Illinois, USA. A *P* < 0.05 was considered statistically significant with a confidence interval of 95%.

**Results:** Data from the medical records of 117 patients with an average age of  $32.59 \pm 5.48$  years were analyzed. Of this total, 48 (41%) had been diagnosed as having primary infertility. In 95 (81.2%) patients, there was an abnormality in the fallopian tubes and in 27 (23%) patients, there was an abnormality in the uterus. Patients with primary infertility were significantly younger ( $29.7 \pm 5.6$  vs.  $34.58 \pm 4.75$ ; *P* < 0.001), and tubal and uterine pathology was more common (*P* < 0.08 and 0.01).

**Conclusions:** Our review indicates that the most common pathology found through HSG in women presenting with infertility is tubal blockage.

**Key words:** Fallopian tubes, infertility, uterus, Saudi Arabia

ملخص البحث :

تستخدم أشعة الصبغة الرحمية لتقييم السيدات اللواتي يعانين من تأخر الحمل. أجريت هذه الدراسة لمقارنة النتائج الملحوظة في أشعة الصبغة الرحمية لدى السيدات السعوديات اللاتي يعانين من تأخر الحمل. هذه دراسة إسترجاعية لهؤلاء السيدات اللاتي اخضعن لهذا الفحص وذلك في الفترة مابين يونيو 2007 ومايو 2012. وتم الحصول على المعلومات من الملفات الطبية والتي شملت العمر وعدد سنوات الزواج وتاريخ الدورة الشهرية وتأخر الحمل وتحليل الهرمونات وعن وجود التهابات سابقة بالحوض. تضمنت الدراسة 711 سيدة بمتوسط عمري 32 سنة. تم تشخيص

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تغيرات مرضيه في قناة فالوب لدى 81% من المريضات، بينما 23% منهن كن يعانين من عيوب رحمية. وكانت السيدات اللاتي يعانين من تأخر الحمل الأولي اصغر عمراً. خلصت هذه الدراسة إلى أن معظم حالات تأخر الحمل كانت بسبب انسداد في قناة فالوب.

## INTRODUCTION

The worldwide incidence of infertility is reported in the range of 8–12% and approximately another 15% of couples remain subfertile.<sup>[1,2]</sup> In 50% of couples who are infertile or subfertile, the cause of the infertility or subfertility is attributable to female factors; however in up to 20% of cases, the reason for the subfertility remains unexplained.<sup>[3]</sup> Information regarding infertility in the Saudi Arabian population is limited. Blood investigations are routinely conducted as a baseline in women who are undergoing fertility treatment assess ovulation, which is dependent on hormonal levels of follicle stimulating hormone, luteinizing hormone, progesterone level. In addition, a hysterosalpingogram (HSG) is routinely conducted to check tubal patency and uterine cavity abnormalities which are reported to be the cause of infertility and subfertility in 50% of women.<sup>[4,5]</sup> The HSG test provides information regarding the morphology of the fallopian tubes, its patency and lesions in the uterine cavity and gives a clear picture of the previous pathologies and peritubal effectation.<sup>[6,7]</sup> The advantage of the HSG is that it is quick and easily available in most hospitals and it is believed that the primary role of HSG is in the assessment of tubal patency and it also plays a secondary role in the in assessment of uterine cavity with a sensitivity of 79% and a specificity of 82%.<sup>[8]</sup> The disadvantages are that it is sometime painful, emits radiation during the procedure and presents both false positive and negative findings. Despite these drawbacks, it remains one of the first tests to be performed in infertile patients. The objective of this retrospective study is to identify the results of HSG conducted on infertile Saudi Arabian women, particularly in relation to tubal and uterine pathology.

## PATIENTS AND METHODS

This cross-sectional study was conducted on 117 Saudi Arabian women, who had been classified as infertile or subfertile and who had undergone HSG between June 2007 and May 2012. The women were aged between 21 and 43 years (average  $32.59 \pm 5.48$  years). The patients' demographic data, including age, years of marriage, menstrual history, primary/secondary infertility, hormonal profile, previous infection or pelvic surgery, and diagnostic laparoscopy, were collected from

the medical charts. Radiographic reports of HSG were collected from the picture archiving and communication system and analyzed for fimbrial findings, tubal patency, and cervical and uterine cavity pathology. The data were entered in the database and analyzed using a *t*-test to compare means between age, type of infertility, different pathologies, and all the other parameters assessed. All tests were performed using Statistical Package for the Social Sciences, version 14.0, Chicago, Illinois, USA. A  $P < 0.05$  was considered statistically significant with a confidence interval of 95%.

## RESULTS

The data of 117 female patients aged between 21 and 43 years (average  $32.59 \pm 5.48$  years), with a mean age of married life of  $8.1 \pm 4.86$  (2–22) are shown in Table 1. Of the 117 women included in the study, 47 (40.2%) had been diagnosed with primary infertility, with the remainder identified as having secondary infertility. In 73 (62.39%) patients, menstrual periods were noted as being regular and 68 (58.12%) patients had not been diagnosed as suffering from any disease. In 95 (81.2%) patients, an abnormality in the fallopian tubes was detected and in 27 (23%) patients, an abnormality in the uterus was detected. The data revealed that two patients had a combined uterine and fallopian tube abnormality.

Table 2 gives the details of the HSG and describes the tubal and uterine pathologies. Comparison of the patients with primary infertility and secondary infertility revealed that those with primary infertility were significantly younger ( $29.7 \pm 5.6$  vs.  $34.58 \pm 4.75$ ;  $P < 0.001$ ). The tubal and uterine pathology was more common in women diagnosed with primary infertility than those with secondary infertility ( $P < 0.08$  and  $0.01$ ) [Table 3].

## DISCUSSION

Different modalities have been extensively used in patients for infertility investigations. One of the most common ones used is HSG, which is routinely used to check tubal patency and uterine cavity abnormalities which are frequently reported in cases of infertility. More specifically, HSG provides ample information on the morphology on the fallopian tubes, its patency and lesions in the uterine cavity and gives a better picture of any previous pathologies and peritubal effectation. However,

recently, hysteroscopy (HS) which can directly visualize the uterine cavity has been compared to traditional HSG. Studies suggest that women who get a normal report on HSG, up to 35% had abnormal hysteroscopic findings. Taskin *et al.*<sup>[9]</sup> recommended that HS should be used for patients who are older than 35 years with failed *in vitro* fertilization (IVF). HSG shows unconvincing diagnostic value for intracavitary and structural uterine pathologies in infertility evaluation.

More recent modalities include sonohysterogram (SHG), which is gaining the support of radiologists in the evaluation process of the uterus and the fallopian tubes. Many studies have demonstrated the superiority of SHG over HSG in the evaluation of the uterus prior to IVF, particularly in patients who sustained recurrent abortions.<sup>[10-12]</sup> Acholonu *et al.*<sup>[13]</sup> compared SHG and HSG and found a significant accuracy of SHG of 75.5% compared to 50.3% for HSG due to its sensitivity which leads to a greater predictive value and accuracy. However, SHG cannot determine whether there are any abnormalities in the fallopian tubes.

Recently, Ma *et al.*<sup>[14]</sup> suggested that magnetic resonance imaging (MRI) with HSG can better improve the diagnosis in the pathologies of the adnexa and uterus, but this approach is not frequently used due to the expense and availability of MRI.

Lim *et al.* recommended that in the 21<sup>st</sup> century HSG has no place in the evaluation of infertility and subfertility patients. They also believed that HSG results in unnecessary radiation exposure.<sup>[15]</sup> Laparoscopy is now advocated in the diagnosis of patency of the fallopian tubes even after the confirmation of tubal pathology by HSG and SHG. This procedure is invasive, requires hospital admission, and general anesthesia. However, an advantage of laparoscopy is that it provides a visual of peritubal adhesions.<sup>[16]</sup>

## CONCLUSION

Using HSG, our data showed that the majority (58.9%) of infertile patients included in the study had secondary infertility rather than primary infertility, which is in line with other studies.<sup>[17-19]</sup> HSG also revealed that in 81.2% of patients, abnormalities were seen in the fallopian tubes and only 23% in the uterus. Our study confirms that HSG should remain the first-line diagnostic test in the assessment of tubal and uterine abnormalities which are the most common issues influencing the fertility process.<sup>[20-22]</sup> Although our study has the usual limitations

**Table 1: Demographic data of 117 patients**

Parameter	Average with SD
Age	32.59±5.48 (19-43)
Years of marriage	8.1±4.86 (2-22)
Primary infertility (%)	48 (41)
Secondary infertility (%)	69 (59)
Regular periods (%)	71 (60.7)
Irregular periods (%)	46 (39.3)
Hyperthyroidism (%)	11 (9.4)
Hypertension, polycystic ovary syndrome and diabetes mellitus (%)	7 each (24.9)
Sickle cell disease (%)	5 (4.27)
Fibroids (%)	3 (2.56)
Endometriosis and epilepsy (%)	2 each (3.41)
Asthma (%)	1 (0.85)

SD – Standard deviation

**Table 2: Hysterosalpingography findings in 117 patients**

	Number of patients (%)
FT	
Normal	18 (15.38)
Bilateral block	32 (27.35)
Unilateral block (left)	32 (27.35)
Unilateral block (right)	30 (25.6)
Hydrosalpinx	1 (0.85)
UT	
Normal	10 (8.54)
Fibroids	9 (7.69)
Bicornuate	8 (6.83)
Septate	5 (4.27)
Arcuate	2 (1.7)
Sherwood, unicornuate, synachae	(3) 1 each (2.56)

Combined FT and UT: Left side and septate (1) and right side and synechia. FT – Fallopian tube; UT – Uterus

**Table 3: Comparison between the primary and secondary infertility patients**

	PI	SI	P
Total number of patients	47	70	
Age	29.7±5.6	34.58±4.75	<0.001
Years of marriage	5.85±3.8	9.62±4.93	<0.001
Regular periods	27	44	<0.5
Irregular periods	20	26	<0.5
FT	34	60	0.08
UT	14	13	0.01

1 patient in PI had combined FT and UT abnormality, 2 patients in SI had combined FT and UT abnormality. PI – Primary infertility; SI – Secondary infertility; FT – Fallopian tube; UT – Uterus

of any retrospective analysis, it is the first of its kind in the Saudi Arabian infertile population.

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## Conflicts of interest

There are no conflicts of interest.

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