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 cavitary 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 ± 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 ± 5.6 vs. 34.58 ± 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

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INTRODUCTION

The worldwide incidence of infertility is reported in the range of 8–12% and approximately another 15% of couples remain subfertile.[1,2] 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.[3] 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.[4,5] 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 effection.[6,7] 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%.[8] 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 ± 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 ± 5.48 years), with a mean age of married life of 8.1 ± 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 ± 5.6 vs. 34.58 ± 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 effection. 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.\(^9\) 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.\(^10\)\(^-\)\(^12\) Acholonu et al.\(^13\) 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.\(^14\) 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\(^{st}\) century HSG has no place in the evaluation of infertility and subfertility patients. They also believed that HSG results in unnecessary radiation exposure.\(^15\) 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.\(^16\)

**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.\(^17\)\(^-\)\(^19\) HSG also revealed that in 81.2% of patients, abnormalities were seen in the fallopian tubes and only 25% 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.\(^20\)\(^-\)\(^22\) Although our study has the usual limitations of any retrospective analysis, it is the first of its kind in the Saudi Arabian infertile population.

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**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**

| Parameter | 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 synchie. FT – Fallopian tube; UT – Uterus

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

| Parameter | 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
Conflicts of interest
There are no conflicts of interest.

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