Research Article

The study of hysterosalpingogram as an investigation tool performed among the infertile women of Al Bahah city of Saudi Arabia - A retrospective study

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ABSTRACT

Background: Hysterosalpingogram (HSG) is one of the diagnostic patterns used for infertility. The diagnostic criteria associated with vital information of details of fallopian tubes, uterus anatomy, and any other congenital abnormalities. **Objectives:** The objective of this study was to assess the value of HSG performed among the women of Al Bahah city. **Materials and Methods:** A retrospective study conducted at the Government Hospital of Al Bahah city. The data with women diagnosed for infertility were considered during the period between January 2014 and November 2018 in the inclusion criteria. The data included ethnicity, details of fallopian tube, uterus cavity details, and endometrium thickness. The collected data were tabulated in an Excel sheet and were analyzed using IBM Statistical Package for the Social Sciences Inc. using version 20 software. **Results:** The study comprised a total of 98 cases of infertile women, in which, 25.5% of women suffered from uterine cavity defect and 73.8% suffered from tubular obstruction. It was observed that 29.5%, 16.3%, and 27.5% had left, right, and bilateral tubular blockages, respectively. **Conclusion:** The retrospective study of HSG images among the infertile women showed the pattern of HSG based on fallopian tube and uterine cavity. The data showed the increase in fallopian tube pathology than in uterine cavity defects. The cultural and social barriers of Saudi women in this region with associated dependence for accessibility to health care might be the reason for the increase in tubular blockage.

KEY WORDS: Fallopian Tube; Uterus Cavity; Fluoroscopy; Infertility

INTRODUCTION

Women health is partially affected by various beliefs and cultural practices in the society associated with vital medical, psychological, and socioeconomic problems.[1] The world health organization reports reproductive health and infertility as a global health issue.[2] Many countries have focused on improving maternal health care among women.[3] In an average percent of couples suffering from infertility or subfertility is associated with tubular or uterine cavity factors, only with few cases, the reason is unexplained. Information regarding infertility in the Saudi Arabian population is limited.[4]

The tubular evaluation among the subfertile women is done best by hysterosalpingogram (HSG),[5] Johnson, *et al*. described that it is fairly accurate in identifying the proximal tubal disease,[6] and as safe, not much expensive and may potentially be associated with increased pregnancy rates as per the review-based study by Cochrane database systematic review in 2005. HSG gives a clear optimal delineation of the fallopian tubes, which help in the detection of tubal patency, tubal occlusion, tubal irregularity, and peritubal disease. In general, the HSG procedure is done in the proliferative phase

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of the cycle and ensured that the woman is not pregnant.[7] Furthermore, for the patients having any comorbidities such as pelvic inflammatory disease, previous ectopic pregnancies, or endometriosis.[7]

The HSG widely used as the first line of a diagnostic tool for infertility,[8] it gives detailed structural integrity and radiographical images of the cervical canal, uterine cavity and fallopian tubes blockage, leading to infertility.[4,9-13] It is economically accessible and helps in the quick interpretation of the reports. Few diagnostic images used for reasoning the details of infertility are ultrasound, MRI, and transvaginal sonography, which is the diagnostic method of preference as it is a non-invasive technique to study the uterine cavity and ovaries with follicular development during ovulation, but HSG plays a detailed role in reasoning details of tubular anatomy, uterine cavity, endometrial thickness, and its pathology or any malignancy, which is primary reason of infertility.[6,11,12,14,15]

The lifestyle practices among Saudi women depend on their cultural and social practices of the region. Early marriage, consanguinity, parity, and multiparity are associated with obstetrical risk,[1] and this is considered high in comparison to the west as Saudi Arabia has a culture of having a large family.[7] Literature regarding the Saudi women health of Al Bahah, the southern region of Saudi Arabia is not available. Hence, this study is taken up to study the tubular and uterus cavity using HSG.

The objective was to access the value of HSG among the infertile women of Al Bahah city.

MATERIALS AND METHODS

Ethical Clearance

The retrospective study was conducted ethically with the permission of the Hospital Ethical Committee to access the hospital records.

A retrospective study conducted at Government General Hospital at Radiology Department. The data collected were the patients in whom HSG procedure performed among the Saudi women attending between January 2014 and June 2018. The inclusion criteria included (a) diagnosed infertile women and (b) details of radiographic images and report related to infertility. The exclusion criteria included (a) congenital abnormalities and (b) malignancy incomplete reports. A total of 416 women had undergone HSG examination, of which, 98 samples which satisfy the inclusion and exclusion criteria considered in this study.

Test Methods

The HSG was performed during the proliferative phase that is during the 7th–12th day of the menstrual cycle (the 1st day being the menstrual bleeding); during these days, the endometrial is thin which helps in knowing the non-existence of the pregnancy. The HSG performed with injection of iodine-based contrast agents, and an image was accessed based on the contrast spill on uterine and tubular anatomy. Various studies report the HSG details of the infertility.

Statistical Analysis

Categorical variables presented in number and percentage. Qualitative variables were tabulated with a percentage using the frequency distribution. Mean and the standard deviation calculated for continuous variables. Infertility being the constant variables; Pearson Chi-square test was used based on the row and column of the variables table. The data entered into MS Excel spreadsheet, and analysis was done using the Statistical Package for the Social Sciences version 21.0 (IBM).

RESULTS

The data collected during the study period were in the age group of 21–49 years with a mean age of 34.18 years (STD ± 5.27 years). The age group was categorized with 5-year age interval into six age groups. Table 1 shows the distribution of study individuals based on the age group, majority 41 (41.8%) was in the age group of 31–35 years.

Table 2 shows the table and graph distribution of the normal and abnormal uterine cavity. The study observed that 25 (25.5%) women suffered from the abnormal uterine cavity with 33.3% were in the age group of 26–30 and 36–40 years.

Table 1: Showing age distribution of the study individuals

Age groups	Frequency (%)
21–25	5 (5.1)
26–30	15 (15.3)
31–35	41 (41.8)
36–40	25 (25.5)
41–45	10 (10.2)
46–50	2 (2.0)
Total	98 (100.0)

Table 2: Showing the distribution of study individuals with normal and abnormal uterine cavity based on age group

Age groups	Normal (%)	Abnormal (%)	Total
21–25	4 (80.00)	1 (20.00)	5
26–30	10 (66.67)	5 (33.33)	15
31–35	35 (85.37)	6 (14.63)	41
36–40	16 (66.67)	9 (33.33)	25
41–45	7 (70.00)	3 (30.00)	10
46–50	1 (50.00)	1 (50.00)	2
Total	73 (75.26)	25 (24.74)	98

Table 3: Showing the percentage distribution of the types of tubular blockage based on the age group

Age groups	Normal *n* (%)	Fallopian tube blockage *n* (%)			Total
		Left unilateral	Right unilateral	Bilateral	N
21–25	2 (40)	3 (60)	0 (0)	0 (0)	5
26–30	2 (13)	2 (13)	6 (40)	5 (33)	15
31–35	12 (29)	14 (34)	5 (12)	10 (24)	41
36–40	8 (33)	7 (29)	2 (8)	8 (29)	25
41–45	2 (20)	3 (30)	1 (10)	4 (40)	10
46–50	0 (0)	0 (0)	1 (50)	1 (50)	2
Total	26 (27)	29 (30)	15 (15)	27 (28)	98

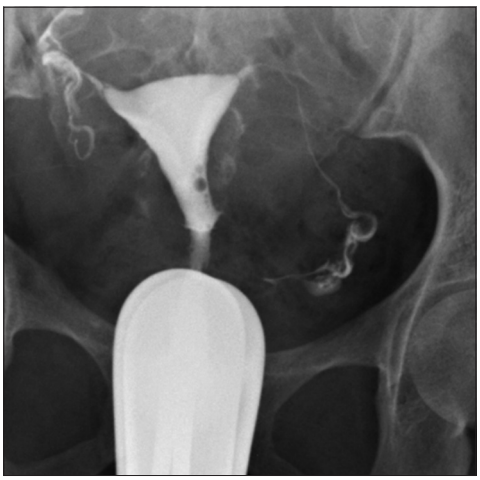

Figure 1: Normal fallopian tube with bilateral spill

Figure 2: Unilateral blockage with left tubular blockage and right tubular contrast spill

Table 3 shows that HSG pattern of the fallopian tubes with 72 (73.8%) had tubular block comprising of left and right unilateral blockage with 29 (29.5%) and 16 (16.3%), respectively, and 27 (27.5%) of women's suffered from bilateral fallopian block 26 (26.5%). The normal tube without any pathogenesis in 26 (26.5%) was observed.

Figure 1 illustrates the normal report with uniform bilateral contrast spill on both sides of the fallopian tubes. Figure 2 illustrates the unilateral blockage with an illustration showing

Figure 3: Tubular bilateral blockage, with no contrast spill in both sides of the tubes

the left side tubular block with no spill of the contrast. Figure 3 illustrates the bilateral tubular block with no contrast spill in both sides of the tubes.

DISCUSSION

In the present study, the majority of 41 (41.8%) individuals were in the age group of 31–35 years. The study observed that 25 (25.5%) of women suffered from the abnormal uterine cavity with 33.3% were in the age group of 26–30 and 36–40 years; HSG pattern of the fallopian tubes with 72 (73.8%) had tubular block comprising of left and right unilateral blockage with 29 (29.5%) and 16 (16.3%), respectively; and 27 (27.5%) of women suffered from bilateral fallopian block 26 (26.5%). The normal tube without any pathogenesis in 26 (26.5%) was observed.

As shown, the mean age of three women is 4.18 years, which is compatible with the studies conducted among the Ghanaian women in Nigeria (33.2%).[16] This is not surprising because it is the peak of the female reproduction stage. Similar mean age was observed among the African women.[10] It was observed that data of majority women had normal HSG report of 70.1%, which was observed similar to the study conducted by Thellier *et al*.[17] The percentage of the lesser normal report observed in developing countries among the

Ghanaian women of 39.7%,[16] and Indian women of 43% and 48.8%.[12,18] The prevalence of infertility (21.9%) was lesser in the present study in comparison to the global prevalence of 33%.[19] The reason for more normal HSG and less prevalence of infertility might be early marriage and social norms of Saudi women[1] and lesser infection in compare to African women.[19]

The uterine cavity abnormalities can be contributing factor for subfertility or infertility; the present study data showed 25.5% of the abnormal uterine cavity with 6 (6.1%) showed fibroids. It observed that each case of uterine synchie, bicornuate, and unicornuate uterus with majority reports 85 (86.7%) showed a normal uterine cavity. Studies among Swiss women showed an increased amount of uterine cavity abnormality of 50%.[9] The increased percentage of abnormal reports might be due to the late onset of marriage or caused by infection due to dilation and curettage caused by unwanted pregnancy, which leads to adhesion and further pathology.[10] The HSG gives the details of this pathology in detail.[9]

The present study shows 26 (26.5%) cases had normal fallopian tubes with free contrast material spillage, whereas 72 (73.4%) cases had fallopian tube abnormalities. The prevalence of tubular block was observed lesser in studies conducted by Bhatt *et al*.,[18] the reason being early medical attention and social cause might be the reason, as one of the causes of the tubular block is by infection. The tubular anatomy is thought to assist in preventing vaginal bacteria from gaining entrance to the body. At the same time, this tiny structure is prone to accumulation of secretions and scarring from inflammation, leading to unwanted sterility or infertility.[20]

The present study revealed a percentage of left tubular block 29 (29.5%) was more than right tubular block 16 (16.3%), a bilateral tubular block was 27 (27.5%) one of the studies by Bukar *et al*. reports more in right tubular block than left,[15] Botwe *et al*. reported 12.5%, 10.6%, 20.5 in left, right, Bilateral tubular block among the Ghanaian women[16] which is similar to the present study.

Limitation

The study lacks the comparative technique used as common as HSG and lacks the data regarding the women with pathology not reported to the hospital due to social cause, which might be one of the barriers among Saudi women in this region. Further study based on community household with hospital referral is necessary.

CONCLUSION

In conclusion, the reproductive lifestyle of Saudi women of Al Bahah region varies and depends on socioeconomic and educational factors. High parity, early marriage, dependence on the male to access health care, consanguinity, and circumcision are the factors associated with infection and inflammation. The retrospective study revealed the use of HSG and its significance in detailed images of uterine pathology and tubular blockages, which play a diagnostic value for infertility. The present study gives the importance of the use of HSG in women's health.

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