

Comparison of hysterosalpingography and laparoscopy in infertile Iranian women with tubal factor

Porównanie histerosalpingografii i laparoskopii u niepłodnych irańskich kobiet z czynnikiem jajowodowym

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Streszczenie

Objective: Mechanical factors are responsible for approximately 30% of female infertility and various methods such as transvaginal ultrasonography, hysterosalpingography (HSG), hysteroscopy and laparoscopy have been used to investigate these factors. The aim of this study was to evaluate if HSG alone can be accurately used, compared with laparoscopy, in order to reduce health care costs in high medical standard setting in infertile women with tubal factor.

Methods: Retrospectively, medical records of women admitted to a local Iranian hospital were selected. Records of those who underwent both HSG and laparoscopy were studied. Afterwards, the findings were compared in regard to tubal obstruction.

Results: A total number of 181 records was included into the study. By both methods, 99 women were evaluated to have normal findings, and 37 women - abnormal findings, i.e. 136 of 181 (75%) HSG reports were accurate in reference to laparoscopy. However, there were 3 patients with abnormal fallopian tubes that were not detected by HSG and, moreover, 42 patients with normal tubes which were reported as abnormal by HSG. The calculated sensitivity and specificity of HSG in our study were 0.92 and 0.70, respectively.

Conclusion: Although laparoscopy is considered as the reference standard in infertility workup, HSG can be performed first and, therefore, the use of laparoscopy should be limited to cases suspected for etiologies other than intratubal, such as endometriosis and peritubal adhesions.

Keywords: **hysterosalpingography / laparoscopy / infertility / fallopian tube patency tests / tubal obstruction / sensitivity and specificity /**

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Streszczenie

Cel: Czynniki mechaniczne są odpowiedzialne za około 30% przypadków niepłodności u kobiet i w celu ich zbadania na całym świecie używane są różnego rodzaju metody, takie jak ultrasonografia przezpochwowa, hysterosalpingografia (HSG), histeroskopia i laparoscopia. Celem niniejszej pracy było porównanie wyników HSG i laparoskopii w diagnostyce czynnika jajowodowego u niepłodnych kobiet irańskich.

Metody: Retrospektywnie wyselekcjonowano dokumentację medyczną kobiet przyjętych do lokalnego szpitala irańskiego. Do badania włączono jedynie informacje z historii chorób, które zawierały opisy zarówno HSG, jak i laparoskopii. Następnie wyniki HSG zostały porównane z wynikami laparoskopii odnośnie stanu drożności jajowodów.

Wyniki: Finalnie, do badania włączono dokumentacje medyczne 181 kobiet. Obie metody oceniły stan jajowodów jako prawidłowy u 99 z nich, a jako nieprawidłowy u 37. Oznacza to, że w 136 przypadkach na 181 (75%) wynik HSG był poprawny, czyli taki jak w laparoskopii. Natomiast 3 pacjentki z nieprawidłowościami jajowodów nie miały tych patologii wykrytych w HSG, a kolejne 42 kobiety z prawidłowymi jajowodami były ocenione w HSG jako osoby z nieprawidłowymi jajowodami. Obliczone czułość i swoistość HSG w naszym badaniu wyniosły, odpowiednio, 0,92 i 0,70.

Wniosek: Mimo iż laparoscopia jest uznana za złoty standard w diagnostyce niepłodności, to HSG może być wykonywana jako pierwsza metoda, a korzystanie z laparoskopii powinno być ograniczone do przypadków podejrzanych o etiologię inną niż wewnątrzjajowodowa, takich jak endometrioza i zrosty okołojajowodowe.

Słowa kluczowe: **hysterosalpingografia / laparoscopia / niepłodność / drożność jajowodów / okluzja jajowodów / złoty standard / czułość i swoistość /**

Introduction

Mechanical factors account for approximately 30% of infertility in women [1], and various methods such as transvaginal ultrasonography, hysterosalpingography (HSG), hysteroscopy and laparoscopy have been used to determine the underlying factors [2, 3]. Yet, controversies regarding the application of laparoscopy in infertility treatment still exist. There are investigators who suggest that laparoscopy is the diagnostic reference standard and can be performed routinely to all patients [4, 5]. On the contrary, however, its potential complications (e.g. adhesion formation), patient's stress and high costs raise doubts about its routine use [6, 7]. Therefore, application of accurate and minimally invasive methods has been supported by some clinicians so that unnecessary laparoscopy is avoided. In this regard, HSG is one of the cost-effective methods by which tubal patency can be assessed. In fact, some researchers recommended to perform laparoscopy after normal HSG findings as HSG has been reported to be quite specific but not sensitive and less accurate in detecting peritubal adhesions and infections [4, 8, 9].

Therefore, the objective of the present study was to evaluate whether HSG alone can be accurately used, compared with laparoscopy, in order to reduce health care costs in high medical standard setting.

Materials and Methods

This retrospective study was carried out in Besat Hospital affiliated to Kurdistan University of Medical Sciences, Sanandaj, Iran. Medical records of all infertile women attending our institution between 2005 and 2007 were reviewed. Patients who had had both HSG and laparoscopy done to exclude mechanical infertility were selected. Any evidence of occlusion of the fallopian tube(s) was considered as abnormal, irrespective of the site of the problem. The statistical analysis was performed using SPSS 15.0 software.

The institutional committee of ethics approved the study in advance and all expenses were covered by health insurance.

Results

Of available 221 records, 181 patients had both HSG and laparoscopy performed. These patients were 17 to 46 years old (mean 28.8). The distribution of age data was consistent with normal distribution.

The distribution of normal and abnormal tubal findings at laparoscopy and HSG is demonstrated in Table 1. Of 181 studied records, 99 patients were diagnosed by both methods as normal, and 37 patients - as abnormal. This means that 136 women were diagnosed similarly by the two methods (contingency coefficient = 75.1%; 136/181). This coefficient was 56.3% and 43% for normal and abnormal patients, respectively. Furthermore, Table I presents details on unilateral or bilateral nature of detected occlusions.

Table II presents the comparative statistics of the two methods. The calculated sensitivity, specificity, and positive and negative predictive values for HSG were 0.92, 0.70, 0.46 and 0.97, respectively.

Discussion

The assessment of tubal patency in infertile women is a crucial step that can be proceeded by laparoscopy [10, 11]. This method can detect tubal obstruction, as well as endometriosis, pelvic inflammatory disease and peritubal adhesions [6]. However, complications, costs and stress imposed on patients may confine its application.

After reviewing related randomized controlled trials (RCTs), Bosteels et al. did not find enough evidence in favor of routine use of laparoscopy for infertility [6]. Moreover, Lavy et al. suggested not performing laparoscopy on women with normal or unilaterally affected fallopian tubes. They explained that laparoscopy would not alter the decision made in case of discrepant v laparoscopy to all patients with normal HSG when they evaluated 57 women with unexplained infertility and found 46 patients (80.7%) to have abnormal findings [8]. Additionally, Mol et al. hypothesized that laparoscopy should be considered in women with normal tubes

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Table I. Number of patients with normal and abnormal results of HSG and laparoscopy.

results	normal	abnormal		total
		unilateral	bilateral	
HSG	102 (56.4%)	79 (43.6%)		181 (100%)
		28 (15.5%)	51 (28.2%)	
laparoscopy	141 (77.9%)	40 (22.1%)		181 (100%)
		24 (13.3%)	16 (8.8%)	

HSG: hysterosalpingography

Table II. Number of same diagnoses (normal and abnormal) by each of the methods.

		laparoscopy		total
		normal	abnormal	
HSG	normal	99	3	102
	abnormal	42	37	79
total		141	40	181

HSG: hysterosalpingography

or unilateral tubal involvement (but not bilateral involvement) no sooner than 10 months after HSG [5]. Sakar et al emphasized the role of HSG as an economically affordable method which explores tubal and intrauterine abnormalities. They postulated that the superiority of laparoscopy in detection of ovarian, peritubal and intra-abdominal pathologies can be added to the advantages of HSG [9]. Swart et al. conducted a meta-analysis on the accuracy of HSG for the diagnosis of tubal pathologies, and they found the methods's specificity of 0.83, and sensitivity of 0.65 [4]. Somewhat surprisingly, to our knowledge, no study has yet determined the sensitivity of normal HSG alone in the infertility assessment.

In our study, we found that 75.1% of the patients could be accurately diagnosed by HSG, a relatively high figure, whereas 24.9% of the patients had discrepant diagnoses, with 3 (1.7%) false negative cases and 42 (23.2%) false positive cases. The resulting sensitivity and specificity were 0.92 and 0.70, respectively. Okonofua et al. studied 48 patients with HSG, laparoscopy and laparotomy, the latter taken as the reference [12]. In HSG, 5 patients had normal tubes and 43 patients abnormal tubes. For laparoscopy, these numbers were 3 and 45, and for laparotomy 2 and 46. Unfortunately, the authors did not calculate sensitivity and specificity for their study. Mol and colleagues assessed 794 infertile women in whom both HSG and laparoscopy was performed [5]. They found sensitivity and specificity values for HSG to be 0.81 and 0.75, respectively. As expected, specificity values for HSG in our study and the Mol study were comparable, whereas their sensitivity value was lower. Based on a similar investigation of 82 cases, Sakar et al. reported sensitivity of only 0.63 and specificity of 0.89 [9], thus a sensitivity also lower than ours. The present study differs clearly from results by other investigators in high sensitivity found for HSG.

Conclusion

We conclude that although laparoscopy is considered as the reference standard in infertility workup, HSG can be performed

first and, therefore, the use of laparoscopy should be limited to cases suspected for etiologies other than intratubal, such as endometriosis and peritubal adhesions.

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