

Laparoscopic Finding and Chlamydia Trachomatis Infection in Infertile Women

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Abstract

This study was done to explore the relationships between serum Chlamydia antibody and detection of tubal damage by laparoscopy in infertile women. Case series study design was used. It was conducted at Infertility Unit in Al-Batool Maternity Teaching hospital, Mosul, Iraq over one year period from January 2011 to January 2012. The study subjects were 121 infertile women. The mean age of them was 29 ± 5.64 years; (range: 19 – 44). Two-third of them (65.0%) presents between 20-30 years old. From all patients consent was obtained for venous blood sample and then underwent diagnostic laparoscopy, venous blood samples were analyzed by enzyme linked immune sorbent assay for determination of Chlamydia IgG Ab. The results of the study revealed that Chlamydia IgG Ab was positive in 48 women (39.7%) while negative in 73 women (60.3%). Laparoscopic findings in women with Chlamydia positive antibody were tubal damage (distal or proximal occlusion of one or both fallopian tubes) 27.1%, adhesion (periadnexial adhesions) 31.3%. Endometriosis 18.8%, normal pelvis 22.9%, and laparoscopic findings in women with Chlamydia negative antibody were tubal damage 12.3%, tubal adhesion 23.3%, endometriosis 17.8%, and in normal pelvis 46.6%. It seems that there is a relationship between laparoscopic findings and serological tests for Chlamydia trachomatis infection in infertile women, so serology for Chlamydia trachomatis become an integral part of the fertility work up.

Key word: *laparoscopy, infertility, Chlamydia trachomatis, serology.*

Introduction

Infertility is defined as the inability to conceive despite regular unprotected sexual intercourse over a specific period of time usually 1-2 years^[1,2]. Accordingly, 50% of

couples failing to conceive during the first year will conceive in the second year which justified starting investigation for infertility after one year^[2,3].

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It has been estimated that infertility affects 9% of couples of whom 70% suffer from primary infertility and 30% secondary infertility. Worldwide, more than 70 million couples suffer from infertility the majority being residents of the developing countries [2, 4].

Tubal pathology is contributory factor in 15-30% of women presenting with infertility. The most common causes of tubal factor infertility are past pelvic infection through sexually transmitted diseases, for example *Chlamydia trachomatis*, resulting in tissue damage, scarring and adhesion formation. This can affect tubal function and result in either partial or total tubal occlusion, which is diagnosed by the following methods, X-ray hysterosalpingography, laparoscopy, or hysterosalpingo-contrast sonography. Functional competence of the fallopian tubes implies not just patency but also the integrity of the mucosal lining or the endosalpinx. As any damage to the fallopian tubes tends to be irreversible, correction can be difficult [1, 5, 6].

Chlamydia is the most common bacterial sexually transmitted infection in the UK, affecting both men and women, most people with Chlamydia have no symptoms, and Chlamydia can

lead in women to infertility, ectopic pregnancy, pelvic inflammatory disease (PID) and chronic pelvic pain [1, 7]. *Chlamydia trachomatis* is an obligate intracellular, bacterium; serovars D through K are pathologic to mucosal epithelial cells of the urogenital tract [8, 9]. Following acute infection, PID develops in 20% of cases. Each subsequent episode of PID double the risk for tubal factor infertility via epithelial cell deciliation, secretory cell disruption, oedema, agglutination within the lumen of the fallopian tube and at its fimbriated end and peritonitis-induced external tubal adhesion [10, 11]. Chronic infection and reinfection are strongly associated with cellular changes, such as fibrosis and mononuclear cell infiltration that can lead to increased risk for ectopic pregnancy and tubal factor infertility [12, 13].

As antichlamydial IgG antibodies persist for extended periods in some women, even despite antibiotic therapy so serological tests were used in the diagnosis of Chlamydia trachomatis infections. More than 70% of women with tubal occlusion have elevated antichlamydial antibodies [9].

Antichlamydial IgG antibodies have been studied using a number of

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different methodologies commercially available enzyme-linked immunosorbent assays (ELISA) a quantitative test, much easier to perform and showing great promise as non invasive predictors of tubal factor infertility [14, 15].

The **aim** of the present study is to explore the relationships between serum Chlamydia antibody and detection of tubal damage by laparoscopy in infertile women.

Patients and methods

Prior to data collection, essential administrative and official permission were obtained from the Research and Ethical Committee in Directorate General of Health in Ninawa. A formal consent were taken from every women included in the sample. A case series study design was done at Infertile Unit in Al-Batool Maternity Teaching Hospital in Mosul, over one year period from January 2011 to January 2012. A convenient sampling technique was adopted, where every infertile woman visiting the Infertile Unit during study period invited to participate in the study. At the end of data collection period 121 infertile women enrolled in the study.

A questionnaire was completed for all women through direct interview by one of the researchers, venous blood samples were taken and then all women underwent diagnostic laparoscopy. The diagnostic laparoscopy was done using the same method and the same principle in reporting the results by the gynecologists who work in the infertility clinic in Al Batool maternity hospital (at study time). Laparoscopy was done as a day case under general anesthesia. Pneumoperitoneum was created by CO2 gas through varess needle. During the procedure, pelvis was inspected, visualizing uterus, fallopian tubes, ovaries, round ligaments, uterovesical pouch, uterosacral ligaments, and pouch of Douglas.

The tubes were visualized and any abnormalities were noted. Both ovaries were examined for any abnormalities. Peritubal, periovarian and omental adhesions, tubo-ovarian masses, endometriotic deposits, presence of free fluid in the pouch of Douglas or any other pathology of the appendages if present was noted.

The patency of the fallopian tubes was ascertained by injecting methylene blue into the uterine cavity

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and observing it as it spilled through the fimbrial ends.

In the laboratory, the venous blood samples were centrifuged for 10 minutes then sera were collected and stored in a deep freeze until analysis by ELISA method was performed for determination of Chlamydia IgG Ab by using microplate immune assay- MIA technique.

Descriptive statistics including frequencies and percentages was carried out by using Minitab version 16.2 software statistical program. Z-test for two proportions was used to test differences between two proportions. P-values ≤ 0.05 were considered statistically significant in data analysis.

Results

1- Age distribution: - The mean age of 121 infertile women was 29 ± 5.64 years; (range: 19 – 44). Two-third of them (65.0%) present between 20-30 years old.

2- Duration of infertility: - Most (90.1%) of women in the study sample were infertile for more than 48 months, while short duration infertility (12-24 months) found only in 2 cases (1.7%), (Table 1).

3- Types of infertility: - Primary infertility constitutes 83.6% of the sample and the rest were secondary infertility.

4- Use of contraception: - Use of contraception in infertile female in our study was 22 cases (18.2%). Thirteen women use oral contraceptive pills (10.7%), 5 women use intrauterine devices and 4 women depends on barriers methods (male condom).

5- ELISA test for Chlamydia IgG

Ab: - Serology of Chlamydia was positive for 48 women (39.7%) while negative serology of Chlamydia was 73 women (Table 2).

6- Presentation of infertile women with Chlamydia positive antibody:-

Clinical presentation of infertile women with Chlamydia positive antibody in our study was menstrual changes in 22 women (45.8%), vaginal discharge in 20 women (41.7%), and pelvic pain in 6 women (12.5%) as shown in Table (3).

7-Laprosopical finding and

serology of Chlamydia: - Table (4) demonstrates the relationship between laparoscopic finding and serology of Chlamydial infection. Normal pelvis found in 22.9% of Chlamydia antibody positive and 46.6% of Chlamydia antibody negative test results and the differences was significant ($p = 0.005$).

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Also there was significant difference in respect to tubal damage (distal or proximal occlusion of one or both fallopian tubes) in the two groups ($p = 0.046$). Whereas, endometriosis found to be almost similar in the two groups; 18.8% and 17.8% of Chlamydia antibody positive and negative tests respectively. Similar finding regarding tubal adhesion (periadnexial adhesions), ($p = 0.339$).

Discussion

In this study, the peak age period for Chlamydia trachomatis infection was between 20-30 years old, 78 patients (65.0%). While in Wisal et al. 2010 the peak prevalence age for Chlamydia trachomatis infection is between 15-24 years old, 143 women (84%) which is higher than the frequency of our study^[16, 17]. This could be due to the different cultural setting where sexual intercourse started at earlier age.

Regarding long duration of infertility (>48 months) 90.1% of the present study women belong to this group and this long duration of infertility pattern considered different in comparison to result obtained by Veeneman and Vander 2002 who found that the peak duration of

infertility between 12-36 months (71%)^[18]. This could be due to availability of family doctors who explain the problem and refer patient to infertility clinics more earlier than our patient who consult many doctors without benefit.

Regarding the use of contraception 22 women (18.2%) use contraception while Molana et al. 2005 found that the use of contraception (66%)^[19]. This could be due to different cultural setting.

The most common presentation of infertile women with Chlamydia positive antibody was menstrual changes (45.8%) while the second presentation vaginal discharge (41.7%) and pelvic pain (12.5%). This result was in agreement with Obuna et al. 2012 who found that the most common presentation of infertile women with Chlamydia positive antibody were menstrual irregularity (45.8%), vaginal discharge (43.9%) and pelvic pain (37.0%)^[20].

For the Chlamydia Ab testing in infertile women in our study was positive in 39.7% while in Wisal et al 2010 who found that Chlamydia trachomatis specific antibodies were detected in 28.1%^[16]. This could be due to the availability of prevention

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programs, health education, and early diagnosis and treatment.

Tubal damage (blockage) detected by laparoscopy in 27.1% of infertile women with positive Chlamydia antibody test while it was 12.3% in infertile women with negative Chlamydia antibody in our study (Table 4), statistical analysis showed significant result ($P = 0.046$), and this result was less than the result of Wisal et al. 2010 who found that 48.5% of infertile women have tubal blockage^[16].

Shibahara et al. 2003 demonstrates that tubal occlusion was confirmed in 32.3% of infertile women with positive Chlamydia antibody test^[21]. Valentine et al. (2010) study was found that tubal occlusion in infertile women was 38%^[22]. These could be due to different cultural setting.

Tubal adhesions were found in 31.3% of infertile women with positive Chlamydia antibodies tests while it was 23.3% in infertile women with negative Chlamydia antibodies, however this difference was not significant ($P = 0.339$). This could be due to other non Chlamydial infections which cause peritubal adhesions while in Wisal et al. 2010 who found that tubal adhesion in infertile women with positive Chlamydia antibody were 13%

while it was 2.4% in infertile women with negative Chlamydia antibody^[16, 23]. This could be due to early diagnosis, proper drug intake with the proper dose which leads to prevention of ascending infection and peritubal adhesions.

Endometriosis in our study was found in 18.8% of infertile women with positive Chlamydia antibody while 17.8% in infertile women with negative Chlamydia antibody tests. In Valentine et al. 2010 study who found that 22% have endometriosis in infertile women with Chlamydia positive antibody^[22] in these conditions there might be two pathologies at the same time.

Laparoscopic findings of normal pelvis in infertile women was higher in women with negative Chlamydia antibodies tests (46.6%) than other pathological findings (tubal damage 12.3%, adhesion 23.3%, and endometriosis 17.8%). This result was in agreement with Valentine et al. 2010^[22].

CONCLUSIONS:

The frequency of Chlamydia trachomatis infection in infertile women is high. Most common presentation of infertile women with Chlamydia positive antibody is menstrual changes. There is a

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relationship between laparoscopic findings and serological test results for Chlamydia trachomatis infection in infertile women, so serology for Chlamydia trachomatis should be considered an integral part in the fertility work up.

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Table (1): Duration of infertility in the sampled women (n = 121).

%	No.	Duration in months
1.7	2	12-24
3.3	4	24-36
5.0	6	36-48
90.1	109	>48

Table (2): The frequency of Chlamydial infection in the studied women.

%	No.	ELISA results
39.7	48	Positive
60.3	73	Negative

Table (3): The frequency of the presenting symptoms among the studied patients with positive Chlamydia IgG-Ab.

%	Positive Chlamydia IgG-Ab [n = 48] No.	Symptoms
12.5	6	Pelvic pain
45.8	22	Menstrual changes
41.7	20	Vaginal discharge

Table (4): The frequency of the laparoscopic findings in both chlamydia +ve &-ve Ab tests in the studied women (n = 121).

Laparoscopic finding	Women with +ve Chlamydia Ab test		Women with -ve Chlamydia Ab test		P-value*
	No.	%	No.	%	
Normal	11	22.9	34	46.6	0.005
Endometriosis	9	18.8	13	17.8	0.896
Tubal damage	13	27.1	9	12.3	0.046
Adhesion	15	31.3	17	23.3	0.339
Total	48	100.0	73	100.0	---

* Z-test for two proportions was used.

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الخلاصة:- أجريت هذه الدراسة لتبين العلاقة بين نتائج الفحص الناظوري مع المتدثرات الحثرية في مصل الدم للنساء العقيمت ، هذه الدراسة المستقبلية لشاهد الحالة أجريت في مستشفى البتول التعليمي في مدينة الموصل، العراق. فترة الدراسة من كانون الثاني ٢٠١١ الى كانون الثاني ٢٠١٢ . (١٢١) امرأة مصابة بالعمم أجريت عليهم الدراسة ٦٥% منهم أعمارهم بين ٢٠-٣٠ سنة. من جميع النساء أخذت الموافقة ، ثم أخذت عينات من الدم الوريدي لكل واحدة منهم ثم اجري لهم الفحص الناظوري التشخيصي، عينات الدم تم فحصها بطريقة (ELISA) لمعرفة وجود المضادات للمتدثرات الحثرية. وجد أن الفحص كان موجبا في ٤٨ امرأة (٤٠%) وكان سالبا في ٧٣ امرأة (٦٠%). كانت نتيجة الفحص الناظوري للنساء العقيمت اللواتي كانت نتيجة فحصهم للمتدثرات الحثرية موجبا كالآتي التصاق الأنابيب ٣١%، انسداد الأنابيب ٢٧%، بطانة الرحم المهاجرة ١٩%، سليمات الحوض ٢٣%. اما اللواتي كانت نتيجة فحصهم سالبة فوجدنا سليمات الحوض ٤٧%، التصاق الأنابيب ٢٣%، انسداد الأنابيب ١٢%، بطانة الرحم المهاجرة ١٨%. تبين أن هناك علاقة بين نتائج الفحص الناظوري في النساء العقيمت مع الفحص السر ولوجي للمتدثرات الحثرية . ولهذا فان هذا الفحص جزء ضروري في عمل شعبة العمم .