

Studying the Frequency of Helicobacter Pylori Infection Among Women Suffering from Polycystic Ovary Resorting to Hospital Infertility Center

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ABSTRACT

Polycystic ovary syndrome (PCOS) is in fact a chronic form of anovulation which is usually observed besides a large spectrum of clinical symptoms and signs. Helicobacter pylori is one of the most common infections that afflict humans. Considering the large prevalence of helicobacter pylori, particularly in developing countries, and the possibility of its effect on polycystic ovary syndrome (PCOS), the present research seeks to study the frequency of helicobacter pylori among women suffering from PCOS resorting to the infertility clinic of Mirza Kouchak Khan hospital from 2010 to 2011. A cross-sectional – descriptive research was conducted on 110 patients suffering from PCOS who had resorted to the infertility clinic of Mirza Kouchak Khan hospital from 2010 to 2011. As much as 5 cc blood was taken from the participants and after removing serum, blood samples were stored in a temperature of -20 °C. Using ELISA test and in accordance with kit manufacturer's protocol (Trinity Biotech), IgG/IgA antibody titre was measured. The raw data was then analyzed using IBM SPSS Statistics v.15. The average and standard deviation of the age of those suffering from PCOS in this research was 26.55 ± 4.06 years old. The average and standard deviation of patients' BMI in this research was 26.77 ± 4.09 . The results of categorizing age group and evaluation of antibody titre (IgA or IgG) showed that people aging 30 to 40 years old exhibited the highest rate in being identified with the positive titre of at least one antibody. The results of assessing IgG and IgA antibody titres by ELISA test showed that those people with a positive IgG titre are much more than those with positive IgA titre. Considering the results of this research and the scientific evidences presented here concerning complications of women's reproduction organs with helicobacter pylori, we may suggest that this bacteria acts as a risk factor in afflicting the patients with PCOS.

Keywords: Polycystic Ovary Syndrome, Helicobacter Pylori, Infertility.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common complication of internal glands among patients before menopause. A frequency of

4 to 12 percent is reported for this syndrome¹. PCOS syndrome was first introduced in 2016². The most common symptoms of this syndrome are chronic anovulation, polycystic ovary, infertility, menstrual disorder, hirsutism, hyper-androgenism and

obesity^{3,4}. Considering the considerable frequency of infertility among families, this issue has become one of the most important problems of fertility health⁵. According to reports, as many as 15% of all couples suffer from infertility^{6,7}. One of the most important causes of infertility is the faulty performance of ovary which is observed in 30 to 40 percent of all cases of infertility. PCOS is important as it can influence fertility and it is considered to be the most common cause of ovarian failure⁷. As a result, various researches have been conducted over the last few years on operation and complications of this syndrome. *Helicobacter pylori* is a small and bending gram-negative bacilli that is completely mobile and resides in mucosal layer of human's stomach. This bacteria was first discovered in 1984 and its discovery was one of the most important developments in medical sciences⁸. *Helicobacter pylori* is one of the most common infections that afflict humans. It is estimated that as many as half the whole population of the earth has experienced this infection⁹. Factors such as dense population, living under unhealthy conditions, contaminated food or water and contact with contents of infected people's stomach are the major causes of this infection. This diseases follow a person to person transmission pattern through mouth to mouth or mouth to faeces contact. There is a stockpile of evidence which shows this bacteria can act as the background cause of some other diseases. For instance, chronic gastritis and higher risk of affliction with peptic ulcer are among the important consequences of infection with this bacteria^{11, 10}. *Helicobacter pylori* is the cause of most cases of stomach ulcer and is responsible for some forms of gastrointestinal cancers. It is the major cause of stomach cancer, but this microbe does not cause cancer in everyone. As many as 15% of those patients with long-term infection may get afflicted with one of several complications. Pulmonary cancer, cardiovascular diseases and inflammatory bowel disease are some other diseases caused by *helicobacter pylori*. As the results achieved by researchers imply, this infection afflicts us during childhood¹². The frequency of *helicobacter pylori* positive serology during childhood in developing countries is more than what is observed in developed countries. However, higher levels of infection are observed in older ages in developed

countries (13). Several researches have been conducted on frequency of infection with *helicobacter pylori* in various parts of the world and the results indicate different levels of prevalence in different areas. A few researches have pointed to the fact that due to the similarity between stomach and vagina and the cells found in women's reproductive system, *helicobacter pylori* may reside in womb and cause a symptomless infection in this organ over a long period of time¹⁴. Elsick et al could prove an oral-vaginal pattern for this bacteria's transmission¹³. Isolation of *helicobacter pylori* through mouth or vagina by other research groups could confirm the results achieved by Elsick et al¹⁵. There are a few theories that claim *helicobacter pylori* may cause infertility through unknown mechanisms. Involvement of *helicobacter pylori* in women's fertility may be the result of direct transfer of bacteria to vagina or the reaction of antibody transmitted by reproduction organ tissues. In a descriptive study by Mohammed Bagher Khalili, anti-*helicobacter* antibody titre of 180 women (90 fertile and 90 infertile cases as control) was measured and recorded using ELISA. The results found that 65% of samples had positive IgG titre (63.3% of fertile and 66.7% of infertile women). The highest and lowest levels of antibody titre were observed in the age range of 25-34 and 35-42 years respectively. The highest frequency of *helicobacter* infection frequency in both groups was observed among those who had been married for more than 5 years. The highest antibody titre was observed in infertile group with fallopian tube factor, while the least titres were associated with infertility causes of ovarian polycystic. The results indicated a higher frequency of anti-*helicobacter* antibody titre among the infertile than what was observed among controls, but this difference was not statistically significant. Thus, we may conclude that *helicobacter pylori* infection was probably involved in their infertility. What's more, as the level of antibody titre in the infertile with tube factor was significantly more, it is possible for *helicobacter pylori* to cause inflammation in pelvic system and result in infertility among women. The authors have designed this research to study the frequency of *helicobacter pylori* infection among women suffering from polycystic syndrome resorting to Mirza Kouchak Khan hospital. It was also assumed that if a high

frequency of helicobacter pylori infection was observed among patients, controlled researches would take care of this issue.

MATERIALS AND METHOD

This is a descriptive – cross-sectional research conducted on women suffering from PCOS who had resorted to infertility clinic of Mirza Kouchak Khan hospital from 2010 to 2011. The inclusion criteria was being diagnosed with PCOS by two specialists and diagnosis of infertility. Patients who showed no agreement to take part in the research and those who had no signs of infertility and PCOS criteria were excluded from our research. Individuals took part in research voluntarily and with due observation of medical ethics principles after their consent had been obtained and they had become fully aware of research process. First, those women resorting to infertility clinic who had been diagnosed with PCOS by two specialists took part in the research. Then, a questionnaire including demographic information such as age, economic status, education, BMI, PCOS, positive IgG antibody titre, and positive IgA antibody was filled for each participant. . As much as 5 cc blood was taken from the participants and after removing serum, blood

samples were stored in a temperature of -20!. Using ELISA test and in accordance with kit manufacturer's protocol (Trinity Biotech), IgG/IgA antibody titre was measured. Then, antibody titre and patients' experiments were recorded in their files. IBM SPSS Statistics v.15 was used to analyze data. Percentage was used to describe qualitative variables, while average, standard deviation, standard error, and the lowest and highest quantities were used for quantitative data.

RESULTS

The variables were defined and raw data was studied and analyzed using appropriate statistical tests. This research was conducted on 110 women with PCOS resorting to infertility clinic of Mirza Kouchak Khan hospital. The age of patients with PCOS ranged from 17 to 37 years with an average and standard deviation of 26.55 ± 4.06 years. The BMI of patients was also studied and an average and standard deviation of 26.77 ± 4.09 was calculated. The minimum and maximum levels of BMI were 14.20 and 35.61. The patients were divided into 3 groups in terms of their age: younger than 20, 20 to 30, and 30 to 40 years old and their anti-body titre (IgA or IgG) was also assessed based

Table 1: Distribution of positive IgG or IgA among patients in terms of their age

Parameter	Results of studying IgG or IgA	
	Negative	Positive
Patients' age	Younger than 20	60.0%
	20 to 30 years	32.0%
	30 to 40 years	22.2%

Table 2: Distribution of IgA, IgG and IgG or IgA among women with PCOS

Parameter	Number	Percentage
IgA	Positive	39
	Negative	71
IgG	Positive	68
	Negative	42
IgA or IgG	Positive	75
	Negative	35

upon this criteria. As the results indicate, those aging 30 to 40 years old had the highest rate of at least one positive antibody titre (table 1).

ELISA test was used to measure titre of IgG and IgA antibodies. The results found more people with positive IgG titre than positive IgA titre. The details of measuring IgA and IgG titres of all participating patients are presented in table 2.

DISCUSSION

Infertility is quite common among families and is considered to be one of the most important issues of fertility health (5). One of the most important causes of infertility is ovarian performance failure. PCOS is important as it influences fertility and is the most common cause of ovarian failure⁷. *Helicobacter pylori* is a small and bending gram-negative bacilli that is completely mobile. It is one of the most common infections that afflict humans. One of its major consequences is chronic Gastritis and it also causes peptic ulcer. As research indicates, as many as 25 to 50% of people in developed countries and 70 to 90% of people in developing countries are infected with this bacteria. In developing areas, it is possible that 80% of the population get infected with this bacteria before the age of 20. It should be remembered that as people get older, their possibility of infection with this bacteria also increases. As it was pointed out in literature review, the great similarity between female reproduction organ and stomach has led some researchers to claim that this bacteria may reside in womb. Over a long period of time, this will result in infection of that organ without any particular symptom^{14, 16}. In a research conducted by Jalali Farzad *et al*¹⁷, a statistically significant correlation was observed between CAD and serum level of anti-*Helicobacter pylori* IgG and IgA. This correlation is more significant in terms of IgG serum level, particularly in men, while it is not so obvious in terms of IgG level and particularly women. On the other hand, a research conducted by Shaygan Nezhad¹⁸ found that HP.IgG cannot predict formation of atherosclerotic plaques in common

carotid and inner extra-cranial arteries. The recorded level of positive IgG among women with PCOS resorting to infertility clinic of Mirza Kouchak Khan Hospital was 62% while the positive IgA levels among them was only 35%. In 68% of the cases, at least one of these factors was positive. A comparison of results with the normal population in a research conducted in Yazd to study the frequency of *Helicobacter pylori* infection found that 59% of these people had positive serology¹⁹. Another research conducted in the southern areas of Iran reported a frequency of 50% among a population of 5000 people. The following results were achieved concerning the frequency of anti-*H.pylori* positive serology in Delhi for each age group: 38% for those younger than 10, 52% for 10 to 19 years, 59% for 20 to 29 years, 67% for 30 to 39 years, and 54% for those older than 40 years²¹. Another research whose results were published in 2005 had studied the frequency of *Helicobacter pylori* in rural and urban areas of Vietnam. Results indicated a high frequency with an average of 74%. The average frequency of *Helicobacter pylori* in suburban areas was reported to be much higher²². The researches generally point to the fact that the frequency of infection with *Helicobacter pylori* in the middle east region ranged from 40 to 70%²³. A review of these results indicated a higher frequency of *Helicobacter pylori* among women with PCOS compared to normal population. However, these results are not generalizable due to the descriptive nature of our research and the population studied.

CONCLUSION

Considering these results and the fact that this bacteria has an oral-genital transmission pattern and similarities between stomach's and vagina's tissue and keeping in mind the fact this bacteria resides in women's genitals and remembering the greater frequency of *Helicobacter pylori* among women suffering from PCOS, we may suppose that *Helicobacter pylori* acts as a risk factor in affliction with this disease. Analytical and controlled researches are recommended to prove this hypothesis.

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