

Helicobacter pylori infection and gastrointestinal symptoms on Chilean pregnant women

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SUMMARY

Objective: the aim of this research was to determine the prevalence of *Helicobacter pylori* infection on Chilean pregnant women and its relationship with the appearance and severity of hyperemesis and dyspepsia.

Methods: quantitative study of prevalence in a transversal cut with variable analysis. The sample was taken from 274 Chilean pregnant women from the Bío Bío province through vein puncture between June and December, 2005. Pregnant women were informed of this study, interviewed and signed an informed consent. The samples were processed using ImmunoComb II *Helicobacter pylori* IgG kit. Statistical analysis was performed by means of the Statistical Package for Social Sciences (SPSS) Program.

Results: out of the total number of pregnant women, 68.6% showed infection by *Helicobacter pylori*. 79.6% of the total sample had symptoms of dyspepsia, and 72.5% of this group presented *Helicobacter pylori* infection. 12.4% showed pregnancy hyperemesis; among them, 79.4% were infected with *Helicobacter pylori*. 73.4% of the pregnant women that showed gastric discomfort during the first three months had *Helicobacter pylori* infection. 53.7% of them continued with gastric discomfort after the first three months; of those, 95.8% were infected. *Helicobacter pylori* infection was present only in 1.5% of pregnant women without gastric discomfort.

Conclusion: both, gastric discomfort of pregnant women and the continuity of severe symptoms of dyspepsia and hyperemesis after the first three months of gestation are significantly correlated with *Helicobacter pylori* infection.

Keywords: *helicobacter pylori*, pregnancy, hyperemesis, dyspepsia.

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INTRODUCTION

Helicobacter pylori (*H. pylori*) is a well-known bacteria; it produces multiple and serious gastrointestinal diseases. The World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) recognized the bacteria as carcinogen Class I in 1994.^{1,2,3}

In the last few years, this bacterium has not only been related to gastrointestinal diseases, but also to pathologies associated to bad absorption of nutrients like cardiovascular diseases, anemia, low birth weight babies, headache, and lipid metabolism alteration.⁴

For years, it has been considered normal that women in the first three months of pregnancy show very un-

comfortable gastric symptoms (such as morning sickness, heat, acidity, stomach ache, vomiting, headache, meteorism and flatulence) that may persist even during the whole pregnancy or with little reduction of the symptoms during this period. These symptoms are attributed exclusively to hormonal changes and adaptive mechanisms of the organism in pregnant women.⁵ A few investigations have been made about the possible association between these symptoms and the presence of chronic gastrointestinal infections.^{6,7} Furthermore, the lack of this type of studies in Chile prompted us to study this possible relationship in our country.

The occurrence of nausea and vomiting during pregnancy is most common. They are present in about 80% of all pregnancies in different degrees. Severe cases, called hyperemesis *gravidarum*, are seen in 1% of the population and are characterized by the occurrence of >3 episodes of vomiting per day with ketonuria and >3 kg or 5% weight loss, dehydration, loss of nutrients, hydro-electrolyte and acid-base disorder, with certain effects in fetal development. Women with hyperemesis *gravidarum* suffer physically and psychologically, which has been documented in many studies.^{6,8}

Dyspepsia is a persistent or recurrent abdominal pain or discomfort of the upper abdomen⁶ and is present in 80% of all pregnant women, undermining the quality of their nutrition, well-being and quality of life. They are not usually treated and this may even be considered normal.^{9,10}

It has been demonstrated that inflammatory processes and infections in different areas of the body, even in the mouth, produce relative risk of premature birth.⁵ It is thus important to dedicate time and money to search for a relationship between infections and chronic inflammatory processes in GI tract, especially in the stomach, where the absorption of nutrients takes place.

Due to the facts mentioned above, the aim of this work is to determine prevalence of *H. pylori* infection in a population of pregnant women, to establish the existence of a relationship between the presence of this bacteria and occurrence and severity of hyperemesis and dyspepsia.

METHODS

Target population: the population analyzed included pregnant women from the 13 municipalities of the Bío Bío province, Chile. The sample included 274 pregnant women. The size of the sample was calculated according to: 1) the total number of women included in prenatal controls in the health services of the 13 municipalities of Bío Bío province (Health Service of Bío Bío) during 2004 (3,369 pregnant women) and 2) a prevalence of 70% of *H. pylori* in the Chilean population (95% confidence interval).

Requirement: women were required to be pregnant during the year 2005, to be living in one of the 13 municipalities of the Bío Bío province, to be voluntarily interviewed and to sign an informed consent form.

Exclusion criteria: twin pregnancy, psychological disease or mental incapacity to answer the interview.

Sample collection: performed by means of venipuncture (3cc) on previously informed pregnant women who

provided permission and answered an interview to study some variables.

Determination of *H. pylori* infection: the blood samples were processed using ImmunoComb II *Helicobacter pylori* IgG Kit. This Kit is a fast test for semi quantitative determination of IgG antibodies against *H. pylori* in human plasma or serum. It provides good sensibility and specificity and it was previously validated in our laboratory with male and female adult samples.

Statistical analysis: the variable analysis was performed by Chi-square, using the Statistical Package for Social Sciences (SPSS) software.

The relevant variables analyzed were: history of GI disease before pregnancy and related treatments, obstetric history (anemia, miscarriage symptoms, and premature birth symptoms), hygienic conditions at home and family history of gastric disease.

RESULTS

Out of the sample of pregnant women from the Bío Bío province (274), 68.6% showed *H. pylori* infection (188 women). It is not possible to compare the percentages of *H. pylori* infection among different municipalities because the sample size was different in each one of the municipalities (Table 1).

TABLE 1 Frequency of *Helicobacter pylori* (HP) infection in pregnant women of the municipalities of the Bío Bío province

Municipalities	HP(-)		HP(+)		Total
	N°	%	N°	%	
Bío Bío Province					N°
Antuco	1	1.2	1	0.5	2
Buenuraqui			1	0.5	1
Cabrero	1	1.2	5	2.7	6
Huepil			1	0.5	1
Laja	35	40.7	73	38.8	108
Los Ángeles	12	14	32	17	44
Mulchén	3	3.5	8	4.3	11
Nacimiento	3	3.5	2	1.08	5
Negrete	9	10.5	20	10.6	29
Quilleco			1	0.5	1
San Rosendo	20	23.5	34	18.1	54
Santa Bárbara	1	1.2	4	2.1	5
Tucapel			2	1.1	2
Yumbel	1	1.2	4	2.1	5
Total	86	31.4%	188	68.6%	274

The total frequency of dyspepsia in the pregnant women included in this study was 79.6% (218 women) and 12.4% (34 women) had pregnancy hyperemesis.

Absence of discomfort was reported by 27 pregnant women and only 4 of them (1.5%) were infected with *H. pylori*, a statistically significant difference ($p < 0.0001$) (Table 2). Table 2 also shows results obtained when *H. pylori* infection was correlated with gastric discomfort (dyspepsia or hyperemesis) during the first three months of pregnancy. Pregnant women showing gastric discomfort were 247 (90.1%) while 27 (9.9%) did not report gastric discomfort. Among women with discomfort, 184 (67.1%) were positive for the infection while 63 women (23%) were negative. This difference is statistically significant ($p < 0.0001$).

TABLE 2 Frequency of gastric discomfort (dyspepsia and hyperemesis) and *H. pylori* infection in pregnant women of the municipalities of the Bío Bío province during the first trimester

Appearance of gastric discomfort		<i>Helicobacter pylori</i> infection			
		Positive		Negative	
		N°	%	N°	%
Showed gastric discomfort the first three months of pregnancy	247 (90.1%)	184	67.1	63	23
No gastric discomfort during the first three months of pregnancy	27 (9.9%)	4	1.5	23	8.4
Total	274 (100%)	188	68.6	86	31.4

Table 3 shows the same analysis as above, but includes the relationship between the group of pregnant women that continued or not with gastric discomfort after the first three months of pregnancy and the presence or not of *H. pylori* infection. Therefore, we found that among

the pregnant women that continued with gastric discomfort (144 women), 95.8% (138 women) had *H. pylori* infection. On the other hand, in the group of pregnant women with no gastric discomfort (124 women), only 36.3% (45 women) were infected, such difference being statistically significant ($p < 0.0001$).

DISCUSSION

The percentage of *H. pylori* infection found in this population of pregnant women was 68.6%, which is within the range expected considering our country's socioeconomic level and prevalence of the infection.¹¹ A comparative analysis of the percentage of infected women and the municipalities where they live could not be performed due to an important variation in the size of the sample in each municipality.

This study showed that among these pregnant women, 79.6% had dyspepsia symptoms and 12.4% had hyperemesis during their pregnancies. The percentage of pregnancy hyperemesis found is above the national average, which is in the range of 3 to 5%.^{5,12} Both symptoms, dyspepsia and hyperemesis, do not affect the integrity of pregnancy, but they affect the quality of life during pregnancy. Therefore, more accurate and detailed studies and treatments are required.^{5,12}

Shirin et al. (2007) investigated the relationship between *H. pylori* infection and the presence of gastric discomfort in pregnancy, finding a significant association between this infection and hyperemesis. However, *H. pylori* infection was not related to all gastric symptoms of pregnancy.¹³ The results obtained in this study were similar.

Nelson et al. (2000) showed a significant relationship between CagA positive *H. pylori* strains and dyspepsia symptoms.¹⁴ This relationship suggests that the present work could be completed with a study of this kind, through serology for detection of anti-CagA antibodies present in pregnant women's serum.

The appearance of gastric symptoms in the beginning of pregnancy is correlated with *H. pylori* infection, as the-

TABLE 3 Frequency of gastric discomfort (dyspepsia and hyperemesis) and *H. pylori* infection in pregnant women of the municipalities of the Bío Bío province after the first trimester

Gastric discomfort continues after the three first months of pregnancy		<i>Helicobacter pylori</i> infection			
		Positive		Negative	
		N°	%	N°	%
Showed gastric discomfort the first three months of pregnancy	144 (53.7%)	138	95.8	6	4.2
Without gastric discomfort during the rest of pregnancy	124 (46.3%)	45	36.3	79	63.7
Total	268	183	68.6	85	31.4

se symptoms were present in 90.1% of de sample and the positive serological reaction to infection was 67.1%. In addition, there is a relationship in terms of continuity of the symptoms; out of the 53.7% of pregnant women that continued to experience gastric discomfort, 95.8% were infected with *H. pylori* ($p < 0.0001$).

In this work, the direct relationship between the presence of *H. pylori* infection and the continuity of dyspepsia symptoms and hyperemesis after the first three months of pregnancy is confirmed. It has been reported that pregnant women with dyspepsia showed low or moderate response to *H. pylori* infection, while women with hyperemesis showed an accentuated response to infection; confirming the relationship between severity of symptoms and grade of infection (Shaban et al.), in which there is a powerful correlation between *H. pylori* and hyperemesis gravidarum.⁶

This research should be complemented with other techniques used to detect *H. pylori* infection. Considering that the target of this type of studies is pregnant women, invasive methods including biopsy must be discarded, and with that, all analysis based on biopsy samples to detect this microorganism (histological analyses, urease detection, culture and PCR). Nevertheless, samples of feces could be used to detect this bacterium (detection of bacterial antigens) or detection of specific bacterial DNA in such samples, although its use might be limited by cost. Since a non-invasive method was required for the present work, the ImmunoComb II *Helicobacter pylori* IgG Kit, a rapid non-invasive test for quantitative determination of IgG antibodies against *H. pylori* in serum or plasma, was chosen. Furthermore, previous studies of correlation have been done in our laboratory (unpublished data) in adult male and female populations using this kit to diagnose *H. pylori* infection.

There is a long way to advance in this aspect. This study and others^{5, 7, 9, 11, 12, 15, 16} suggest that, for a pregnant woman both dyspepsia and hyperemesis are not normal events. It is our opinion that this area needs to be considered to a greater extent in future studies, aiming at solving this problem, because a high percentage of the pregnant women go to the physician during pregnancy due to one of these symptoms, with impact on the mother to be, her baby and the family as a whole.

Consequently, we believe that more research involving pregnant women is required, with the proposition of a plan to search gastric morbidity in contraceptive control attempting to improve the quality of life during pregnancy, providing more comfort to pregnant woman, especially in the presence of personal/familiar risk factors. It is impor-

tant to study the best treatment plan for pregnant women with gastric discomfort since it will reduce or eliminate secondary effects for the mother and the baby. This fact will also contribute to reduce, in our country, the diverse digestive pathologies associated to *H. pylori* infection.

CONCLUSION

Both gastric discomfort of pregnant women and the continuity of severe symptoms of dyspepsia and hyperemesis after the first three months of pregnancy are significantly correlated with *H. pylori* infection.

RESUMO

Infecção por *Helicobacter pylori* e sintomas gastrointestinais em mulheres grávidas chilenas.

Objetivo: o objetivo desta investigação foi determinar a prevalência da infecção por *Helicobacter pylori* em mulheres grávidas chilenas e a sua relação com o aparecimento e agravamento de hiperêmese e dispepsia.

Métodos: estudo de prevalência, quantitativo de coorte transversal com análise de variáveis. A amostra foi tomada através de punção venosa em 274 mulheres grávidas chilenas, da província de Bío Bío, nos meses de junho a dezembro de 2005. As mulheres que participaram foram informadas, assinaram um consentimento e responderam uma pesquisa. As amostras foram processadas usando o kit ImmunoComb II *Helicobacter pylori* IgG. A análise estatística foi realizada com o programa *Statistical Package for Social Sciences* (SPSS).

Resultados: do total de mulheres pesquisadas, 68,5% apresentam infecção por *Helicobacter pylori*. Do total, 80,7% tiveram sinais de dispepsia; dessa porcentagem, 72,5% apresentaram infecção por *Helicobacter pylori*. Uma porcentagem de 12,6% das pacientes apresentou hiperêmese grávidica; dessas, 79,4% tiveram a infecção.

Do total das mulheres grávidas com moléstias gástricas no primeiro trimestre de gravidez, 73,4% registraram infecção por *Helicobacter pylori*. Uma porcentagem de 53,7% continuou com moléstias gástricas depois do primeiro trimestre e dentro desse grupo 95,8% tiveram a infecção.

Infecção por *Helicobacter pylori* estava presente em apenas em 1,5% das mulheres grávidas sem desconforto gástrico.

Conclusão: as moléstias gástricas das mulheres grávidas e o agravamento dos sinais de dispepsia e hiperêmese depois do primeiro trimestre de gravidez estão correlacionados significativamente à infecção por *Helicobacter pylori*.

Unitermos: *Helicobacter pylori*, gravidez, hiperêmese, dispepsia.

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