

# Is lower socio-economic status a risk factor for *Helicobacter pylori* infection in pregnant women with hyperemesis gravidarum?

Düşük sosyoekonomik seviye hiperemesis gravidarumlu gebe kadınlardaki *Helicobacter pylori* enfeksiyonu için bir risk faktörü mü?

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**Background/aims:** Lower socio-economic status was demonstrated to be a major risk factor for infection with *H. pylori* infection in the general population. The aim of the present study was to investigate any possible association between infection with *H. pylori* and hyperemesis gravidarum and between socio-economic status and *H. pylori* infection in pregnant women with hyperemesis gravidarum. **Methods:** Fifty-six pregnant women with hyperemesis gravidarum and 90 control pregnant women were enrolled in the study. Forty-five (80.4%) subjects in the hyperemesis gravidarum group and 72 (80%) subjects in the control group were assessed as lower socio-economic status by questionnaire. Specific serum immunoglobulin G for *H. pylori* was assayed by fluorescent enzyme immunoassay method for both groups. **Results:** Serologically positive *H. pylori* infection was detected in 46 (82.1%) subjects of the hyperemesis gravidarum group and in 58 (64.4%) of the controls ( $p=0.024$ ). With respect to the patients with lower socio-economic status, 40 (88.9%) of the 45 patients with hyperemesis gravidarum and 49 (68.1%) of the 72 controls were positive for *H. pylori* ( $p=0.013$ ).

**Conclusions:** This study supports the studies suggesting an association between *H. pylori* and hyperemesis gravidarum. In addition, the lower socio-economic status may also be an important risk factor for infection with *H. pylori* in pregnant women with hyperemesis gravidarum.

Keywords: *Helicobacter pylori*, hyperemesis gravidarum, socio-economic status

**Amaç:** Toplum taramalarında düşük sosyoekonomik seviyenin *H. pylori* enfeksiyonu için major bir risk faktörü olduğu gösterilmiştir. Bu çalışmanın amacı; *H. pylori* ile hiperemesis gravidarum arasındaki ilişkiyi ve hiperemesis gravidarumlu gebelerdeki *H. pylori* enfeksiyonu ile sosyoekonomik seviye arasındaki ilişkiyi incelemektir. **Yöntem:** Çalışma kapsamına 58 hiperemesis gravidarumlu ve 90 normal gebe kadın alınmıştır. Hastalarla yapılan anket sonucu hiperemesis gravidarumlu grupta 44 (%80,4), kontrol grubunda da 72 (%80) vakada düşük sosyoekonomik seviye saptanmıştır. *H. pylori*'ye karşı gelişen immunglobulin G antikorları her iki grupta immunfloresan enzim tekniği ile çalışılmıştır. **Bulgular:** hiperemesis gravidarumlu grupta 46 (%82,1), kontrol grubunda da 58 (%64,4) vakada *H. pylori* enfeksiyonu seropozitifliği tespit edilmiştir ( $p=0,024$ ). Düşük sosyoekonomik seviyeli, hiperemesis gravidarumlu 45 vakanın 40'ında (%88,9), kontrol grubundaki 72 vakanın da 49'unda (%68,1) *H. pylori* pozitif saptanmıştır. **Sonuç:** Bu çalışma *H. pylori* enfeksiyonu ile hiperemesis gravidarum arasındaki ilişkiyi desteklemektedir. Ek olarak, düşük sosyoekonomik seviye de hiperemesis gravidarumlu gebe kadınlardaki *H. pylori* enfeksiyonu için önemli bir risk faktörü olabilir.

Anahtar kelimeler: *Helicobacter pylori*, hiperemesis gravidarum, sosyoekonomik seviye

## INTRODUCTION

Emesis gravidarum (morning sickness) that comprises nausea and vomiting generally begins from the 6<sup>th</sup> to 8<sup>th</sup> gestational week and stops at the end of the first trimester or at the beginning of the second trimester. The clinical picture is seen in 50-70% of pregnancy cases. The more severe case

whereby nausea and vomiting become augmented and continue throughout the day is termed hyperemesis gravidarum (HG). This is encountered in 2% of all pregnancy cases and is associated with weight loss, dehydration and ketonuria.

Although the pathophysiology for HG is not clear,

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it has been proposed that hormonal, allergen, neuropsychosomatic and metabolic factors play a role in the etiology of HG [1-3]. Recently, an association between infection with *H. pylori* and HG has been suggested in some studies [1,4-6]. The major risk factor for infection with *H. pylori* in the general population is low socio-economic status of the family during childhood [7,8]. However, whether or not the low socio-economic status is also a risk factor for *H. pylori* infection in pregnant women with HG has not been investigated.

The aim of the present study was to investigate the possible association between infection with *H. pylori* and socio-economic status in pregnant women with HG.

## MATERIALS AND METHODS

This study was performed in SSK Bakırköy Gynecology and Obstetrics Hospital in Istanbul between September 1998 and September 1999. Fifty-six consecutive women with HE and 90 consecutive pregnant women without the signs and symptoms of HG were enrolled in the study. This study project was approved by the local ethics committee, and carried out in accordance with the Helsinki Declaration. Informed consent was obtained from the patients before the study.

The gestational age was determined by the last menstrual period and confirmed by real time ultrasonography. Diagnosis of HG was made upon the criteria of observation of at least three vomiting episodes a day, loss of at least 5% body weight at the beginning of pregnancy, ketonuria and absence of other possible causes of vomiting such as hyperthyroidism and psychological disorders.

Venous blood (5 ml) was obtained from each subject. Fluorescent enzyme immunoassay method was used to test all blood samples for the IgG specific antibody against *H. pylori* (Clark Laboratories Inc., Jamestown, New York, USA). Ten µl portion from each patient's serum was diluted with 200 µl serum diluent and part of the mixture was kept in ml micropellet boxes. After washing four times with Pasteur LP 35 automatic washing machine (the washing solution was diluted with water to 1/20 fraction), 100 µl conjugate was added and kept for four minutes. After washing again four times, 100 µl chromogen substrate and 10 minutes later 100 µl stop solution were added. The results were read at 450 nm wavelength in microplate autoreader EL 311 SL. Cut-off value was calculated

by multiplying calibration factor on the calibrator by average of three calibrator values. Patient absorbants obtained from the reader machines were divided by the cut-off value. Results greater than or equal to 1.1 were accepted as positive, those between 0.9 and 1.1 were suspected to be positive and those below or equal to 0.9 were accepted as negative.

Personal information, including lifestyle, educational level, occupation, sanitation, and economic status were collected via a questionnaire. The patients were grouped as lower socio-economic group according to their low income, low level education and domestic crowding. All questionnaires were applied by the same person, who was blinded to the patient population. According to results of the questionnaire, the patients were divided in two groups as lower socio-economic status and normal-high socio-economic status.

The statistical analyses were performed by SPSS 10.0 program. The results were given as mean  $\pm$  standard deviation. Student's t-test and chi-square test were applied where appropriate. A p value less than .05 was assumed to be statistically significant.

## RESULTS

The group with HG was comparable to controls with respect to age, gestational week, parity, gravida and past history of dyspepsia ( $p > 0.05$ ). Past history of HG in the HG group was significantly higher than in the controls ( $p < 0.001$ ). In the HG group *H. pylori* seropositivity was significantly higher than in the control group ( $p = 0.024$ ). The rate of low socio-economic status was similar in both groups (Table 1).

The seropositivity of *H. pylori* was significantly higher in the lower socio-economic population of

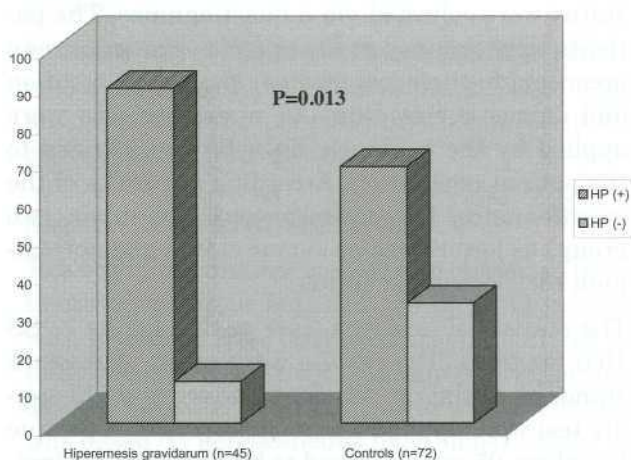
**Table 1.** Clinical properties, *H. pylori* seropositivity and socio-economic status of hyperemesis gravidarum (HG) group and controls

	HG group (n=56)	Controls (n=90)
Age (yr)	29 $\pm$ 5.3 (20-38)	30 $\pm$ 5.9 (20-43)
Gestational week	9.1 $\pm$ 2.5 (5-16)	8.6 $\pm$ 1.2 (6-13)
Parity	1.4 $\pm$ 1.1 (0-5)	2.5 $\pm$ 1.5 (0-8)
Gravida	3 $\pm$ 1.7 (1-10)	4.5 $\pm$ 2.1 (1-10)
Past history of HG (%)	39 (69.6)*	31 (34.4)
Past history of dyspepsia (%)	17 (30.3)	29 (32.2)
<i>H. pylori</i> seropositivity (%)	46 (82.1)**	58 (64.4)
Lower socio-economic status (%)	45 (80.4)	72 (80)

HG: Hyperemesis gravidarum

The ranges are given in parentheses. \* $p < 0.001$  \*\* $p = 0.024$

the HG group [40 (88.9%) of the 45 patients were positive] than in controls [49 (68.1%) of the 72 patients were positive] ( $p=0.013$ ) (Figure 1). In the normal-high socio-economic population, there was no difference in the seropositivity of *H. pylori* in the HG group [6 of the 11 (54.5%) patients were positive] and in controls [9 (50%) of the 18 patients were positive] ( $p=1$ ).



**Figure 1.** *H. pylori* seropositivity (%) in lower socio-economic status patients with hyperemesis gravidarum and in controls

## DISCUSSION

The results of this study show that the seropositivity of *H. pylori* in the HG group was significantly higher than in controls and this difference was more pronounced in the groups of lower socio-economic status. *H. pylori* infection has an impact not only on the mother but also on her child. It was shown that the incidence of transmission is high [9]. Because the childbearing tendency in families with low socio-economic status in Turkey is high, there are more people at risk of infection with *H. pylori*.

In our study, we used serologic method to detect the incidence of *H. pylori* infection. We did not perform histologic studies by gastroscopy or biopsy, considering the high reliability of the IgG assay

and for ethical reasons [10,11]. Most of the study population were of low socio-economic status, because the hospital in which the study was carried out serves especially a population with a lower socio-economic status.

Recently, it was shown that *H. pylori* seropositivity was significantly high in the pregnant population with HG [1,2,4]. Our findings are in accordance with the previous studies. A possible explanation for an association of *H. pylori* and HG could be that an increased accumulation of fluid and a displacement of intracellular and extracellular volume occur in the early phase of pregnancy as a result of increase in steroid hormones, and this condition results in a change of pH which could lead to the manifestation of a latent *H. pylori* infection in the gastrointestinal tract. This was also confirmed by El Younis et al. [12] who treated two pregnant women with HG by erythromycin; all the symptoms resolved via this treatment.

The major risk factor for infection with *H. pylori* in the non-pregnant population is the socio-economic status of the family during childhood, as reflected in the number of persons in the household and sharing a bed, absence of fixed hot water supply, educational level, smoking habits and poor sanitation [3,7]. The association of *H. pylori* and socio-economic status has not been investigated in pregnant women with HG. Wu et al. [13] investigated an association between educational level and *H. pylori* in pregnant women without HG and they found no association between *H. pylori* infection and educational level. In view of the results of our study, we could suggest that the lower socio-economic status is also an important risk factor for the high prevalence of *H. pylori* infection in pregnant women with HG.

In conclusion, this study supports the studies suggesting an association between *H. pylori* and HG. In addition, the lower socio-economic status could also be a major risk factor for infection with *H. pylori* in pregnant women with HG. Infection with *H. pylori* should be kept in mind in cases of HG in pregnant women with lower socio-economic status in Turkey.

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