

# Helicobacter pylori seroprevalance in patients with obstructive sleep apnea syndrome

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**Abstract.** Hypoxemia related conditions are associated with an increased risk of gastric damage. *Helicobacter pylori* (*H.pylori*) infection also causes gastric damage and affects approximately 40 million individuals in Turkey. Obstructive sleep apnea syndrome (OSAS) is a sleep disorder and is characterized by episodic upper airway obstruction during sleep. It is associated with oxyhemoglobin desaturations, hypoxemia and discontinuation of sleep. However, there are a few data in the field of *H.pylori* prevalence among the patients with OSAS which is linked to tissue hypoxemia. The aim of the current study was to investigate the link between *H.pylori* infection and OSAS.

Between February 2011 and February 2012, faeces was collected from OSAS patients (n=24; 12 female) and healthy individuals (n=100, 50 female) and analysed using the *H. pylori* Stool Antigen Test. OSAS was detected with polysomnography in connection with disease symptoms and findings. All data was recorded on SPSS and analyzed with chi-square test.

Among 24 patients with OSAS, 12 (50%) of them had a positive result for *H.pylori* fecal test. In control group (100 subjects), *H.pylori* fecoprevalance was only 15%. *H.pylori* antibody seropositivity was significantly higher in patients with OSAS compared to control patients (p<0.001). Consistent with recent epidemiologic studies to date, seroprevalance of *H.pylori* was found higher than normal subjects.

Seroprevalance of *H.pylori* detected with fecal test were significantly higher in patients with OSAS. OSAS is related to presence of *H.pylori*. A positive correlation between the *H.pylori* infection and OSAS might be hypothesized. This may be due to gastric damage due to OSAS-related hypoxemia.

Key words: OSAS, H. pylori, Stool Antigen Test

## 1. Introduction

*H.pylori* is a gram-negative, motil, microaerophilic, flagellated and spiral bacilli that has first identified from gastric epithelium in patients with chronic gastritis. This organism has an urease activity and produces ammonia (1,2).

Obstructive sleep apnea syndrome (OSAS) is characterized by repeated episodes of upper airway obstruction during sleep, associated with increasing respiratory efforts, intermittent arterial

oxygen desaturation, systemic and pulmonary arterial blood pressure surges, and sleep disruption. OSAS is highly prevalent disease in the population, affecting  $\geq 4\%$  of males and 2% of females (3). The typical OSAS patient is male, middle-aged, and obese. Obesity unfavorably affects respiratory function and may promote the collapse of the upper airway during sleep; in addition, when body weight increases, the frequency of respiratory events during sleep also increases (4,5). The presence and severity of OSAS is usually determined using polysomnography. The apnea-hypopnea index (AHI) is the commonly used metric of sleep disordered breathing.

The rapid stool antigen test is a rapid 10-min assay based on lateral flow chromatography with polyclonal antibodies that detect *H. pylori* antigens present in human stool (1). The aim of

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the current study is to investigate the presence of *H.pylori* infection among OSAS patients.

## 2. Material and method

A total of 24 patients with OSAS (12 men and 12 women; mean age 59 years  $\pm$  26 years) and 100 healthy control subjects (50 men and 50 women; mean age 50 $\pm$ 24 years) were enrolled in the study at the department of gastroenterology and pulmonary medicine in the Yuzuncu Yil University, School of Medicine, Van, Turkey, from February 2011 to February 2012. People who had taken antisecretory drugs including proton pump inhibitors as well as antibiotics were excluded from the study.

The presence of OSAS was determined by polysomnography (PSG). The apnea-hypopnea index (AHI) was used for detecting sleep-disordered breathing. Patient demographics (sex, age, etc.) and clinical characteristics were obtained from clinic records.

Stool samples had taken from patients were analyzed by monoclonal antibody sided chromatographic immunoassay method called as *H. pylori* Stool Antigen Test (HpSA, ACON Laboratories, San Diego, CA, ABD) which is also known as single step fastcard test. During this test samples reacts with dried and colored conjugates on test stripes. Prepared mixture moves forward on membrane by capillary movement and this movement causes displacement of colored particules. In case of a positive result spesific antibodies placed on membranes reacts with red colored conjugates and his situation causes red colorization. The green band near the control line shows adequate mixture levels, appropriate flow situation and working of internal controls for reactives. Absence of this green band means that test was considered as negative. Chi-square test was used for statistical analysis. P value less than 0.001 was considered as statistically significant.

## 3. Results

A total of 24 patients were enrolled in the OSAS group and 100 volunteers as controls. There was no significant difference concerning age, gender and body mass index among the groups. Among 24 patients with OSAS, 12 (50%) of them had a positive result for *H.pylori* fecal test. In control group, *H.pylori* fecoprevalance was only 15%. *H.pylori* antibody positivity was significantly higher in patients with OSAS compared to control patients ( $p<0.001$ ). Consistent with recent epidemiologic studies to

date, seroprevalance of *H.pylori* was found higher than normal subjects.

## 4. Discussion

Data on the literature for the relationship between OSAS and *H. pylori* are poor. In our study, we determined that higher fecoprevalance of *H. pylori* in patients with OSAS. This result demonstrates that there is a positive link between OSAS and *H. pylori* infection.

OSAS is also associated with increased risk of cardiovascular diseases. There are various mechanisms that contribute the increased risk of stroke and other cardiovascular diseases, such as increased sympathetic activity, endothelial dysfunction, elevated fibrinogen levels, increased in vivo platelet activation during sleep, alteration of in vitro platelet aggregability, hypercoagulability, and decreased cerebral blood flow in sleep apnea (SA) patients (6-11).

Gastric mucosal blood flow is the primary defensive factor to protect gastric mucosa. The blood delivers oxygen, nutrients as well as gastrointestinal hormones to support the basic struction, function and turnover of gastric mucosa. Gastric blood flow plays a cardinal role in the production and secretion of mucus and helps to maintain the mucosal barrier. In addition, the blood circulating in the surface of gastric mucosa removes harmful materials and back diffusing hydrogen ions and mantaning the secretion of bicarbonate ion, protecting the mucosa by keeping the intestinal mucosa neutral. Therefore mucosal blood flow has been considered as a major protective factor for gastric mucosal healing (12,13). Increased negative intrathorasic pressure increases venous return to the right heart and causes decreased left ventricule filling that resulting left ventricule failure. Finally, decreased cardiac output and recurrent hypoxemia may damage gastrointestinal circulation as well as gastric mucosa (14,15).

Thus the gastric blood flow plays an important role in the development of gastric ulceration and healing. Gastrointestinal conditions associated with OSAS include gastro-esophageal reflux, hyperlipidemia, hepatic steatosis (16).

There are a few studies about seroprevalance of *H.pylori* in patients with OSAS. However, all of those studies used serum IgG antibodies against *H.pylori* (ELISA) as a diagnostic test. These studies revealed that seroprevalance of *H.pylori* among patients with OSAS was higher than normal subjects (17,18). However, there were no reports about fecoprevalance of *H.pylori* in

patients among patients with OSAS. The current study was the first one that was used *H. pylori* stool antigen test to reveal *H.pylori* prevalence in patients with OSAS as well.

Our study revealed that *H. pylori* infection in OSAS patients was higher than normal subjects. It may be due to OSAS-related poor gastric circulation. The current study supports the fact that, all patients with OSAS should also be tested for *H.pylori* infection.

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