

Frequency of nasal helicobacter pylori carriage among cooks

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Abstract

Objective: To investigate the frequency of nasal helicobacter pylori carriage among cooks living in Bolu, Ardahan and Sakarya province of Turkey.

Methods: A total of 54 cooks (10 from Bolu, 29 from Ardahan and 15 from Sakarya) were enrolled. Nasal helicobacter was tested using polymerase chain reaction.

Results: Helicobacter pylori was detected in only one cook.

Conclusion: Nasal Helicobacter pylori colonisation ratio in cooks in Turkey was found to be very low. Presumably hand hygiene compliance lowered the frequency.

Keywords: Helicobacter pylori, Cooks, Frequency, Nasal carriage. (JPMA 63: 573; 2013)

Introduction

Helicobacter pylori is a spiral shaped, gram-negative bacterium which was initially described in 1982 by Robin Warren and Barry Marshall. Today, H. pylori is firmly established as the etiologic agent of acute and chronic gastritis and a predisposing factor to peptic ulcer disease, gastric carcinoma and B cell mucosa-associated lymphoid tissue lymphoma.¹

H. pylori infection is ubiquitous and infects both males and females. Although infection occurs worldwide, H. pylori prevalence varies among different ethnic, social and age groups within the same country and between countries. Seroepidemiologic studies have determined that approximately 50% of adults in developed countries and 90% in developing countries are seropositive for H. pylori.² However, epidemiological studies from Turkey have indicated that total infection rate used to vary between 66% and 80%, but has decreased steadily over the years.³

Cross-sectional studies concerning the prevalence of H. pylori among adults have been carried out, including random surveys of the general population, groups of healthy volunteers, students, employed workers, or patients attending hospitals or outpatient clinics.⁴ It has also been investigated whether people working in certain occupations had increased prevalence of H.

pylori infection or not. In these studies, H. pylori was frequently investigated in healthcare workers such as dentists,⁵ gastroenterologists and gastroenterology nurses,⁶ endoscopy staffs⁷ and sewage workers.⁸

H.pylori infection is very common in the community. Dissemination of H.pylori among the community is an important matter in terms of public health.⁴ When preparing food in the kitchen, cooks may direct their hands to their noses and touch the food with their hands. If they carry H. Pylori in their noses, their hands may get contaminated with H. Pylori and the bacterium may be transmitted to food from their contaminated hands during cooking, preparing and handling. This is especially important when hand hygiene compliance is not up to the mark. The study was planned to investigate the frequency of nasal H.pylori carriage among the cooks.

Subjects and Methods

For this prospective cohort, the subjects were selected from the cooks living in Bolu, Ardahan and Sakarya provinces of Turkey. Ethical approval was obtained from the Duzce University Ethical Board and the study was done between May and December 2010. A total of 54 cooks - 29 from Ardahan, 15 from Sakarya, and 10 from Bolu - were included. Specimens were obtained from each cook's nostrils by sterile cotton swab. Deoxyribonucleic acid (DNA) was extracted from the samples by using QIAamp DNA Mini kit (QIAGEN, Crawley, UK). Isolated DNA was stored in Tris-ethylenediaminetetraacetic acid (TE) buffer at -20°C until polymerase chain reaction (PCR) amplification was performed. DNA extracts were tested for H. pylori by nested PCR assay targeting 16S rRNA genes. Amplification was carried out in a thermal cyclor

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(Corbett Research Palm-Cycler™, Mortlake, Australia). *H. pylori* DNA (Type strain NCTC 11637) served as positive control. Water and a 'negative sample control' were used as negative controls. The PCR product was examined in parallel with molecular size marker 100-bp DNA ladder. The PCR product was run with 100bp molecular size marker.

The PCR products were then analysed by electrophoresis using 2% agarose and stained with ethidium bromide. The bands were performed using Kodak GL 200 Imaging System and Kodak Molecular Imaging Software (Kodak, Rochester, NY, USA). Results were evaluated as percent value.

Results

Of the 54 cooks, in the study, *H. pylori* was detected in only 1 (1.8%) individual.

Discussion

In our study, *H. pylori* was detected in only one of the 54 cooks. This result is extremely different from the other studies done in Turkey involving other segments of society. One study found the overall prevalence of *H. pylori* Immunoglobulin-G (IgG) in primary school students as 78.5% and 66.3% in 1990 and 2000, respectively by enzyme-linked immunosorbent assay.³ There are a few studies examining nasal *H. pylori* colonisation by PCR. A study investigated *H. pylori* DNA by PCR in patients with laryngeal diseases and nasal polyps.⁹ It detected *H. pylori* DNA in 59.4% of nasal polyps, 70.4% of normal nasal mucosa samples, and 58.6% of larynx samples.

Possible risk factors associated with *H. pylori* positivity have been described. Poor hygiene practices appear to be related with a higher frequency of *H. pylori* infection.¹⁰ In our opinion, hand hygiene compliance in cooks is more than the general population because they wash their hands several times during the day. In this respect, hand hygiene compliance might decrease *H. pylori* frequency among cooks.

Another reason may be the humid environment. Kitchen is a moist environment and the cooks spend most of their time there. Therefore, their nose is moistened constantly. Low *H. pylori* frequency in our study might be related with this moistness.¹¹ The act of vapour on nasal *H. pylori* colonisation should be investigated in further studies.

The curved morphology of *H. pylori* and the polar motility caused by flagella at one end cause screw-like movements, which enable the organism to penetrate

the mucin layer. In stomach, *H. pylori* adheres to mucin, and binds specifically to gastric mucosal epithelial cells both in vivo and in vitro.¹² This spiral shaped bacteria may be penetrating the nasal mucosa and binding to nasal epithelial cells with the same mechanism. In our study, we obtained nasal mucosa specimens from the nostrils by swab. This may have an impact on our results.

H. pylori is occasionally cultured from ectopic gastric mucosa in Meckel's diverticulum, esophagus, rectum, urinary bladder, dental plaque and faeces. It is mainly identified by PCR in dental plaque, liver specimens, and faecal specimens. Recently, *H. pylori* has also been detected by PCR in specimens from the gallbladder and liver.¹² However, there are conflicting results about nasal colonisation. A study comprising 36 individuals who had *H. pylori* in gastric biopsies, *H. pylori* was not found in any of the patients' nasal mucus by direct and enrichment microbiological culture.¹³ In another study, *H. pylori* was detected in 12 of 48 patients (25.0%) with chronic rhinosinusitis, whereas in only 1 of 29 (3.4%) controls by immunohistochemical analysis. *H. pylori* was confirmed with transmission electron microscopy.¹⁴ Another study found *H. pylori* in nasal polyp specimens in 6 of 23 patients by histochemical analysis with Giemsa staining.¹⁵ But *H. pylori* was not detected from mucosa of the middle concha specimens in 15 patients with concha bullosa in that study. By contrast, in a recent study from Turkey, the immunohistochemical examination of the specimens taken from 25 patients with nasal polyps and 25 controls revealed that all patients were negative for *H. pylori*.¹⁶ These studies indicate that more comprehensive studies should be conducted whether *H. pylori* is indeed harboured in these environments.

Conclusion

Nasal *H. pylori* colonisation ratio in cooks was found to be very low. Hand hygiene compliance, humid environment, and penetration property of bacteria might have diminished the frequency. However, colonisation of *H. pylori* in the nose should be investigated further.

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