RESEARCH COMMUNICATION

Lack of Association Between *Helicobacter Pylori* and Laryngeal Carcinoma

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Abstract

Objective: To survey the role of *Helicobacter pylori* at the tissue level as a cause of squamous cell carcinoma of the larynx. Design:A case-control study. Setting: In an Otolaryngology Ward at an academic university. Subjects: Patients with laryngeal cancer as cases and patients with benign laryngeal lesion as controls. Main outcome measure: In all subjects, specimens of laryngeal tissue were examined by rapid urease test while histopathologic examination was achieved to detect *H. Pylori*. Results: Totally, 44 patients (42 men and 2 women) with squamous cell carcinoma of larynx and 30 patients (24 men and 6 women) with benign laryngeal lesions (polyp, nodule, granuloma) were studied, none of which were infected with the bacterium. Conclusion: Our results did not show *H. Pylori* infection among patients with laryngeal cancer (SCC) or benign laryngeal lesions.

Key Words: Helicobacter pylori - laryngeal cancer - rapid urease test - histopathologic examination

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Introduction

Laryngeal cancer is one of the more common cancers in human beings, tobacco being the major risk factor. Other risk factors include alcohol, HPV (Human papilloma virus), chemical carcinogens, positive family history for malignancy, previous radiotherapy and personal history of head and neck cancers (Cummings et al., 2005). HPV is epidemiologically considered as an etiologic factor for laryngeal cancer since it is shown to increase proliferation in laryngeal epithelial cells (Jacob et al., 2002). Other infectious agents might also cause epithelial cell proliferation.

In the gastric mucosa, *Helicobacter pylori* is a gram-negative spiral, flagellated bacillus. Approximately, 30% of population in the developed countries as well as more than 80% of population in developing countries are infected with *H. pylori* (Kasper et al., 2005). H. Pylori colonization induces chronic superficial gastritis. Furthermore, prospective nested case control studies have shown that *H. Pylori* colonization is a risk factor for adenocarcinomas of distal stomach (Kasper et al., 2005). The presence of *H. pylori* is also strongly associated with gastric lymphoma (Kasper et al., 2005). *H. pylori* infection is diagnosed by either invasive (endoscopy and biopsy) or non-invasive (urease breath test (UBT), serology, and stool antigen testing) techniques. Nevertheless, non-invasive techniques including serology and stool antigen are usually applied for early diagnosis while UBT is used for eradication follow up. The sensitivity and specificity of biopsy-based urease test has been approximated 90-95% and 95-100%, respectively (Howden and Hunt, 1998). Larynx is a part of the upper aerodigestive tract. Several studies have reported *H. pylori* both from dental plaque and saliva (Grandis et al., 1997). In the present study, we investigated the presence of *H. pylori* with rapid urease test and histopathalogic evaluation in laryngeal cancer tissues and specimens from benign laryngeal lesions.

Materials and Methods

Totally, 44 patients who underwent laryngoscopy and biopsy with the definite diagnosis of squamous cell carcinoma as well as those who underwent total or partial laryngectomy between May 2006 and September 2007 at academic hospitals of Tabriz University of Medical Sciences were investigated. Tissue specimens from larynx were placed on a gel containing urea and an indicator, then color change was evaluated during the first hour in order to identify *H. pylori*. At the same time, tissue specimens from laryngeal cancer were first fixed in 10% formalin then stained with haematoxylin-eosin (H&E) for routine histopathological evaluation and H. pylori identification.

Tissue specimens from benign laryngeal lesions (polyp, nodule, and granuloma) were also investigated for the existence of H. pylori with histopathalogic evaluation and rapid urease test.

Results

The study population included 42 males and 2 females with squamous cell carcinoma of laryunx and 24 males

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and 6 females with benign laryngeal lesions. The mean age of subjects was 63.1 years (a range, 46-84 years) and 39.8years (a range, 30-50 years), respectively. During rapid urease testing, none of the subjects (in either of the groups) showed color change during the first hour. While 44 slides of laryngeal cancer (squamous cell carcinoma) and 30 slides of benign laryngeal lesions (polyp, nodule, and granuloma) were stained with haematoxylin-eosin, none revealed *H.pylori* existence.

Discussion

Upper aerodigestive tracts have many common etiologies such as smoking alcohol use (Kasper et al., 2005). Larynx is a part of upper aerodigestive tract, therefore, it could be postulated that *H. pylori* play a role in the pathogenesis of laryngeal cancer. However, the present study found no evidence in support of this hypothesis.

Prior investigators have studied *H.pylori* as an etiologic factor for laryngeal carcinoma. Kizilay et al (2006) investigated 69 total laryngectomy specimens with squamous cell carcinoma and 30 laryngeal tissue samples with non-neoplastic diseases (polyp, nodule) but none demonstrated *H. pylori* infection. However, diagnosis was solely on the basis of histology. In the Borkowski et al (1997) study, 35 patients with chronic laryngitis underwent laryngeal biopsy and the existence of *H. pylori* was investigated only by rapid urease test . Although 6 (17.1%) showed positive result, laryngeal tissue can be colonized by other microorganisms containing urease enzymes, thus, results should be cautiously interpreted. Moreover, urease positivity alone could not definitely prove the presence of *H. pylori* (Borkowski et al.,1997). Akbayir et al (2005) examined 50 patients with laryngeal cancer and 50 benign laryngeal biopsy specimens by histopathological and immunohistochemical techniques, but again none demonstrated H. pylori infection.

On the other hand, several serologic studies have been performed to evaluate the association between H. pylori and laryngeal cancer. Aygene et al investigated the presence of IgG antibodies against *H. pylori* antigens by ELISA technique in 26 patients with squamous cell carcinoma of larynx and 32 matched controls. They found 73.1% and 40.6% of patients with squamous cell carcinoma and controls to be seropositive, respectively ($p<0.05$) (Aygene et al., 2001). Rubin et al reported that the presence of *H. pylori* antibodies was significantly higher among patients with laryngeal dysplasia or frank carcinoma of the head and neck in comparison to their associated controls (Rubin et al.,2003). In a study conducted by Nargalieva et al (2005), the incidence of seropositivity of anti-*H.pylori* IgG was similar between laryngopharyngeal cancer and control group (32.8% vs. 27.0%). It should be noted that the prevalence of *H. pylori* is more than 80% in most of the developing countries such as Iran (Kasper et al., 2005), therefore, serologic studies are not suitable for such societies. As described by prior investigators, *H. pylori* may be spontaneously eradicated from both gastric cancer tissue and surrounding atrophic mucosa. Furthermore, it may disappear from laryngeal cancer tissue with time.

In our study, *H. pylori* was not detected in malignant and benign specimens of larynx when both rapid urease testing and pathology were applied, therefore, it is unlikely for H. pylori to be colonized in larynx. Nevertheless, we suppose that larynx is not a permanent reservoir for *H. pylori*. In conclusion, our results demonstrated that *H. pylori* might not contribute to the pathogenesis of laryngeal carcinoma

References

Akbayir N, Basak T, Seren H, et al (2005). Investigation of *Helicobacter pylori* colonization in laryngeal neoplasia. *Eur Arch Otorhinolaryngol*, **262**, 170- 2.

Aygene E, Selcuk A, Celikkanat S, et al (2001). The role of *Helicobacter pylori* infection in the cause of squamous cell carcinoma of the larynx. *Otolaryngol Head Neck Surg*, **125,** 520-1.

Borkowski G, Sudhoft H, Koslowski F, et al (1997). A possible role of *Helicobacter pylori* infection in the etiology of chronic laryngitis. *Eur Arch Otorhinolaryngol*, **254**, 481-2.

Cummings CW, Flint PW, Harker LA , et al (2005). Otolaryngology head and neck surgery. 4th ed, Philadelphia, *Mosby*, 2222-30.

Grandis JR, Perez- Perez GI, Yv VL Johnson JT, et al (1997). Lack of serologic evidence for *Helicobacter pylori* infection in head and neck cancer. *Head Neck*, **19**, 216-8.

Howden CW, Hunt RH (1998). Guidelines for the management of *Helicobacter pylori* infection. *Am J Gastroenterol*, **93**, 2330.

Jacob SE, Sreevidya S, Chacko E, et al (2002).Cellular manifestations of human papillomavirus infection in laryngeal tissue. *J Surg Oncol*, **79**, 42- 50.

Kasper DL, Braunwald E, Fauci AS, et al (2005).Harrison' s Principles of Internal Medicine. 16 th. *McGraw- Hill companies*, 1746- 62.

Kizilay A, Saydam L, Aydin A, et al (2006). Histopathologic examination for *Helicobacter pylori* as a possible etiopathogenic factor in laryngeal carcinoma. *Chemo therapy*, **52,** 80- 82.

Nargalieva ZZ, Groham DY, DahIstrom KR, et al (2005). A pilot study of *Helicobacter pylori* infection and risk of laryngopharyngeal cancer. *Head Neck*, **27**, 22- 7.

Rubin JS, Benjamin E, Prior A, et al (2003).The prevalence of *Helicobacter pylori* infection in malignant and premalignant conditions of the head and neck. *J Laryngol Otol*, **117**, 118-21.