

Original Research Article

Prevalence of *Helicobacter pylori* colonisation in tonsillar tissue in cases of chronic tonsillitis: a prospective study

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ABSTRACT

Background: Human stomach is not the only reservoir of *Helicobacter pylori* but it has been detected in dental plaques, oral lesions and saliva. It could play role in the pathogenesis of various otorhinolaryngologic problems and remains debatable. This study was aimed to find out the prevalence of *H. pylori* in tonsillar tissue of patients with chronic tonsillitis by rapid urease test in a tertiary hospital in Kerala.

Methods: Prospective cross sectional study was done in patients who attended the outpatient department of ENT with a history suggestive of chronic tonsillitis. The patient satisfied the criteria for chronic recurrent tonsillitis were subsequently posted for tonsillectomy. Each specimen was subjected to rapid urease test.

Results: Total 228 patients were included in this study with age ranging between 3 and 31 years (10.0±7.1), with most common age being <10 years in 159 patients (69.7%). Male to female ratio was 1.4:1. Among these, the presence of *H. pylori* was seen in only 6/228 patients.

Conclusions: The possibility of tonsillar tissue acting as a reservoir for *H. pylori* infection is very low.

Keywords: *Helicobacter pylori*, Dental plaques, Chronic tonsillitis

INTRODUCTION

Barry Marshall and Robin Warren described the successful isolation and culture of a spiral bacterial species, later known as *Helicobacter pylori* from the human stomach.¹ It is the first formally recognised bacterial carcinogen and one of the most successful human pathogen.² Unless treated, colonisation of *H. pylori* persists lifelong and nearly half of the world's population is colonised by this gram negative microaerophilic bacteria. Prevalence varies widely with geographic area, age, race, socioeconomic status and ethnicity. Persistent infection is associated with chronic gastritis, peptic ulcer disease, and in some cases atrophic gastritis, mucosa associated lymphoid tissue lymphoma and gastric cancer.³ The 3 proposed routes of

transmission are fecal–oral, oral–oral and gastric–oral.³ *H. pylori* infection commonly occurs before the age of 10 years.⁴

Human stomach is not the only reservoir of *H. pylori* and it has been detected in dental plaques, oral lesions, and saliva.⁵ Recently, some researchers stated that *H. pylori* could play a role in the pathogenesis of various otorhinolaryngologic problems. It has been investigated in tonsils, adenoids, paranasal sinuses and in the middle ears of patients with chronic otitis media.⁶⁻⁹ It has been suggested that *H. pylori* contaminated gastric fluid enters oral cavity by gastro oesophageal reflux disease and, thereby, colonisation possible in dental plaque and adenotonsillar tissue.¹⁰ Recent explanation is that *H. pylori* in gastric mucosa is bound to gastric mucosa-

associated lymphoid tissue which is located in tissue comprising Waldeyer ring.¹¹

Tonsillectomy is one of the most commonly performed operations in paediatric age group. It has been postulated that the infection leads to tonsillar crypt obstruction with a subsequent shift from a resident flora of commensals to one of more numerous and various pathogens.¹² There are conflict regarding the role of *H. pylori* in the pathogenesis of chronic adenotonsillitis. Some researchers stated that *H. pylori* plays a role in the pathogenesis of chronic adenotonsillitis.^{3,13} But others demonstrated that there are no such association. Hence this study was aimed to find out the prevalence of *H. pylori* in tonsillar tissue of patients with chronic tonsillitis by rapid urease test in a tertiary hospital in Kerala.

METHODS

Study design

Prospective cross sectional study was done on patients who attended the outpatient of department of ENT, Amala Institute of Medical Sciences, Amala Nagar, Thrissur, Kerala, India during the period of February 2016 - February 2017 with a history suggestive of chronic tonsillitis. Each patient satisfied the criteria for chronic recurrent tonsillitis and was subsequently posted for tonsillectomy. Exclusion criteria included any patient who had used a full course of antibiotics during the last 2 weeks prior to the study, was on triple therapy for peptic ulcers or who had an indication for tonsillectomy of a diagnosis other than chronic recurrent tonsillitis. Consent was obtained from patient or their relatives. The study design was approved by Institutional Ethics Committee for Research and also according to the guidelines of Helsinki Declaration.

Study procedure

After the tonsillectomy operation, one tonsil per patient was collected. A 2 mm gross specimen was cut out using a sterile blade and gloves. Each specimen was then placed in a test well containing rapid urease (RUT) and an initial colour read at 0 min.¹⁴ Subsequent colour changes were read at 30 min, 6 and 24 h. Any colour change from the initial yellow colour to either pink or red was recorded as positive. Any test well that remained yellow after 24 h was recorded as negative. Use of core tonsillar tissue is recommended due to its sensitivity compared to a surface swab.¹⁵ RUT is a preferred method of examining tissue as it has high sensitivity and specificity.¹⁶⁻¹⁷

RESULTS

Total 228 patients were included in this study with age ranging between 3 and 31 years. Mean age was 10.09±7.18, with most common age being <10 years in

159 patients (69.7%) (Table 1). Male to female ratio was 1.4:1 (Figure 1).

Table 1: Distribution of age and gender.

Age	Sex		Total
	Female	Male	
≤10	64	95	159
11-20	23	27	50
21-30	3	8	11
31-40	2	6	8
Total	92	136	228

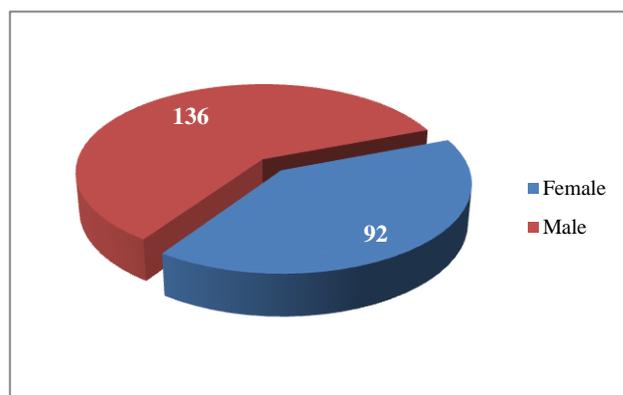


Figure 1: Distribution of gender.

Among these, the presence of *H. pylori* by RUT was seen in only 6 patients. It was negative in 222 patients (Table 2).

Table 2: Presence of *H. pylori* by rapid urease test.

RUT	Frequency	Percentage (%)
-	222	97.4
+	6	2.6
Total	228	100.0

DISCUSSION

H. pylori has been considered to be the most common chronic bacterial infection in humans. Up to 70% population in developing countries is affected by *H. pylori* with majority of them being asymptomatic. Because of its ability to change the microenvironment, it is increasingly found in various tissues of the body. Zhang et al. reported that the infection rate of *H. pylori* in the pharynx is higher in patients with stomach disease.¹⁸ They suggested that chronic pharyngitis might be related to *H. pylori* infection. Unver et al found a 57% rate of *H. pylori* presence in tonsil and adenoid tissues using only RUT.⁶ Minocha et al reported that patients who underwent tonsillectomy were associated with decreased prevalence of *H. pylori* colonization in antral mucosa specimen. They speculated that tonsils might be a reservoir for *H. pylori*.¹⁹ Cirak et al demonstrated a relatively high rate of *H. pylori* in adenotonsillectomy

specimens using PCR.³ They postulated that the tonsil and adenoid tissue may be an ecological niche of the mouth.

However, Di Bonaventura et al could not detect *H. pylori* by PCR in the tonsil swabs and biopsy materials of patients, although *H. pylori* was detected in gastric biopsy cultures.²⁰ They suggested that the tonsils are not an extragastric reservoir for *H. pylori* infection. Similar to this observation, Skinner et al reported that *H. pylori* was negative in the tonsillectomy specimens of 50 patients using immunohistochemistry and RUT. But 28% patients showed positive serum anti-*H. pylori* IgG, suggested that *H. pylori* was not a component of the microflora of the chronically inflamed tonsil.¹² Recently Jelavic et al. also showed that tonsillar tissue is not an important reservoir of *H. pylori* infection in children undergoing tonsillectomy.²¹ Although *H. pylori* does not appear to colonize in tonsils, in cases of chronic tonsillitis, it may be a trigger or a factor resulting in exaggerated inflammatory responses to the otherwise commensal organisms.¹³ Result of this study indicate that *H. pylori* may not be colonised in chronic inflamed tonsil tissues.

The diagnostic tests used to detect *H. pylori* infection are invasive tests requiring endoscopy and biopsy and non invasive tests. Non-invasive tests include urea-breath test, serology and stool antigen whereas the invasive tests include the RUT, histopathology and polymerase chain reaction. RUT is a highly specific (98%) and sensitive (97%) test to detect HP in various tissues and is the most commonly used method to detect *H. pylori* in gastric biopsy materials.¹⁴

CONCLUSION

The possibility of tonsillar tissue acting as a reservoir for *H. pylori* infection is very low, since we did not find significant positivity in adenotonsillar tissue in our patients. Further studies are needed to clarify the possible role of *H. pylori* in upper aerodigestive tract diseases such adenotonsillitis.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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