Original Article

Saliva Secretion and Efficacy of Helicobacter Pylori Eradication in Peptic Ulcer Patients

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Abstract:

Objective: It has been noted that the presence of Helicobacter pylori (H. pylori) in the oral cavity may affect the outcome of eradication therapy. This condition is associated with the recurrence of gastric infection. The optimum secretion of saliva promotes oral health consequently influencing H. pylori eradication. The purpose of this study was to investigate the relation between salivary secretion and the efficacy of H. pylori eradication from the stomach.

Materials and Methods: Forty five patients with gastric H. pylori infection were enrolled in this study. Diagnosis of H. pylori infection was confirmed by endoscopy, biopsy, urease test and histological examination. Salivary secretion of all participants was determined under standard condition before the beginning of antibacterial treatment. Then the patients were treated with a 14-day course anti-H. pylori regimen consisting of amoxicillin, omeprazole, metronidazole and bismuth. The efficacy of eradication therapy was evaluated 4 weeks after the end of the treatment course. Mann-Whitney U test was used to analyze the variables.

Results: The median of salivary secretion among successful and unsuccessful H. pylori eradication groups was 0.48 ml/min and 0.24 ml/min, respectively (p=0.005).

Conclusion: Although the type of drug regimens is challenging, the efficacy of H. pylori eradication from the stomach might be reduced by lower salivary secretion.

Key Words: Saliva; Helicobacter Pylori; Peptic Ulcer

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INTRODUCTION

Helicobacter pylori (H. pylori) is a spiral gram negative bacterium that colonizes the human gastrointestinal tract and is responsible for gastritis and peptic ulcers as well as a risk factor for gastric cancer [1]. The fecal-oral tract is believed to be a common route of transmission of H. pylori so low levels of sanitation and socioeconomic status are associated with an increased prevalence of H. pylori infection [2]. Several studies have demonstrated that H. pylori presence in the oral cavity has a clear association with gastro esophageal infection [3-5]; therefore, failure to eliminate H. pylori

from the mouth could lead to gastrointestinal reinfection [4-6]. The recent PCR analysis showed H. pylori DNA in dental plaques and saliva, suggesting that the oral environment may be one of the many potential pathways for transmission [4, 7-9]. Numerous factors may influence the effectiveness of anti- H. pylori therapy. Since oral cavity could serve as a sanctuary for H. pylori, survival of the bacteria in the mouth despite their eradication from the stomach may promote early reinfection of the stomach reducing the efficacy of eradication therapy [10,11]. It is well understood that poor salivary secretion may contribute to the deposition of dental plaque because of the loss of natural cleansing of the oral cavity. On the other hand, low salivary secretion apply favorable environment for the growth of bacteria including H. pylori. The purpose of the present study was to evaluate the relationship between salivary flow rate and the efficacy of a certain H. pylori eradication regimen among patients suffering from peptic ulcer.

MATERIALS AND METHODS

A total of forty five patients with H. pylori infected peptic ulcer from the Gastroenterology department of Ekbatan Hospital, Hamadan University of Medical Sciences were recruited in the study.

Inclusion criteria were positive gastric H. pylori infection, at least 7 days without drug consumption and no underlying systemic diseases. Pregnant and breast feeding women, smokers and alcohol abusers and those with salivary gland disorders were excluded from the study. All participants signed a standard informed consent form approved by the local institutional ethical committee.

Endoscopic examination was done by one experienced endoscopist for all patients. Gastric mucosa specimens were taken from pre-pylor and body regions for urease test and histological examination [6].

Then the patients were included in the study if the findings of both H. pylori tests were positive.

Before the beginning of H. pylori eradication regimen, whole unstimulated saliva samples were collected on the next day after endoscopy by the standard method [12]. All sample collections were done between 8:00 AM and 10:00 AM to prevent diurnal variations. Subjects were instructed not to drink or eat and perform oral hygiene procedures for 90 minutes before the collection.

The patients were asked to expectorate into a standard scaled test tube every one minute for a total of 5 minutes. Finally, the results were showed in ml/min.

Table 1. Characteristics of Patients Regarding the Efficacy of H. Pylori Eradication

Characteristic		Successful Eradication (n=30)	Unsuccessful Eradication (n=15)	P value
Age	(years) (median)	35	38	0.11*
	(mean rank)	25.5	30	
Women, n (%)		11 (36.7)	6 (40)	0.82
Men, n (%)		19 (63.3)	9 (60)	

*Mann-Whitney U test

After endoscopy and saliva collection, the eradication regimen was started as below: 1) Amoxicillin 2×1000 mg 2) Metronidazole 2×500 mg 3) Omeprazole 2×20 mg and 4) Bismuth 2×240 mg. These drugs were taken twice daily for a period of 2 weeks. The efficacy of H. pylori eradication from the stomach was evaluated by C-13 urea breath test (UBT) four weeks after the end of the treatment regimen [13]. The eradication efficacy was judged successful if the finding of UBT for H. pylori was negative. Statistical analysis was performed by Mann-Whitney U test and using SPSS software version 15, with α level < 0.05 as statistically significant.

RESULTS

A total of 45 patients (17 female, 28 male) who had undergone H. pylori eradication regimen were enrolled into the present study. Of these 45 patients, 15 had unsuccessful eradication. There were no significant differences between successful and unsuccessful eradication groups regarding sex and age (p=0.82 and p=0.11, respectively) (Table 1). The median of salivary secretion rate among unsuccessful eradication subjects was lower than the successful eradication group (p=0.005) (Table 2).

DISCUSSION

The microbiological, serological and DNA genomic results provide evidence that H. pylori can colonize in the oral cavity [14].

On the other hand; it has been noted that H. pylori detection in the oral cavity is associated with gastroesophageal diseases [3]. Thus failure to eradicate H. pylori from the mouth may lead to reinfection of the stomach after treatment [4,5,7,8]. In the oral cavity, H. pylori was detected in dental plaques, oral lesions and in the saliva [15]. It has been noted that poor periodontal health characterized by gingivitis and chronic periodontitis may be associated with H. pylori infection and considered as a potential reservoir of these bacteria [16, 17]. It is therefore suggested that professional plaque removal and oral hygiene procedures should be performed along with eradication strategies of H. pylori [9]. The role of saliva in maintaining oral health is clear. There are possible important factors in the elimination of H. pylori from the oral cavity including the cleansing effect of saliva, salivary antibacterial substances against H. pylori such as specific IgA, IgG, lactoferrin and EGF as well as salivary secretion of anti-H. pylori antibiotics [6,18,19].

Namiot et al. [6] reported that low salivary secretion may contribute to the decrease in efficacy of H. pylori eradication from the stomach, especially in patients with certain drug regimens including omeprazole, amoxicillin and tinidazole.

They compared the effect of two different drug regimens on the eradication of H. pylori regarding salivary flow rate.

Table 2. Salivary Secretion (ml/min) Regarding the Efficacy of H. Pylori Eradication

Eradication	Number	Salivary Secretion (median)	Salivary Secretion (mean rank)	P vaue
Successful	30	0.48	26.8	0.005*
Unsuccessful	15	0.24	15.2	

*Mann-Whitney U test

In the present study, we provided just one antibiotic regimen for all patients and considered more confounding variables. So it may be noted since the salivary concentration of certain drugs is somewhat steady among all studied patients, lower saliva flow rate may result in insufficient infiltration of drugs into the oral cavity and promote unsuccessful H. pylori eradication from the mouth after treatment of the stomach. We also evaluated the efficacy of H. pylori eradication from the stomach at 4 weeks after the end of antibiotic therapy because this is a proper long time for the oral bacteria to survive from the eradication regimen and then reinfect the stomach [5,6]. Although few studies have been published regarding the effect of salivary secretion on the efficacy of H. pylori regimens, our present study which is in agreement with Namiot et al's reports [6,20,21] emphasized that saliva secretion may be one of the many causes of H. pylori eradication failure. However, we strongly recommend further, more comprehensive studies with larger sample sizes to confirm this relation.

CONCLUSION

There is increasing evidence that the mouth is a permanent reservoir of H. pylori, so eradication regimens should simultaneously destroy H. pylori in both the stomach and the oral cavity.

For this reason, it may be necessary to pay close attention to the quantity and quality of saliva in order to reduce the recurrency of gastric infections.

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