ORIGINAL ARTICLE

Identification of Helilcobacter Pylori in Denture Plaque and its Correlation with Peptic Ulcer

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ABSTRACT

It has been suggested that oral cavity and denture plaque might be a potential reservoir of Helicobacter pylori. The aims of the study were to detect the prevalence of H. pylori colonization in denture plaque from the stand point of prevention of peptic ulcer disease in denture wearing patients. Thirty one denture wearers, 20 women and 11 men with a mean age of 67.6 years were used. The fitting surface of dentures was rinsed by sterile water. The denture plaque was swabbed with a sterile cotton lead and transferred into a Compylobacter like organism (CLO) test kit. Results were assessed within an hour. Our results confirm that H.pylori exists in denture plaque which acts as a potential reservoir of H. pylori for peptic ulcer disease.

Key Words: Helicobacter pylori, Denture plaque, CLO test, oral microorganism.

INTRODUCTION

The relationship between oral care and systemic infection, especially opportunistic disease is recently focused in the compromised host, i.e. institutionalized elderly and IV patients. More than 350 species of micro-organisms have been identified in the oral micro flora colonizing the oral cavity. Denture plaque as well as dental plaque acts as a reservoir of colonization by non–resident microorganisms and opportunistic pathogens.

Helicobacter pylori is a major causative microorganism for the gastritis and peptic ulcer disease. H. pylori has been detected in saliva and dental plaque, however the incidence varied widely and there is no information on denture plaque. In the oral cavity H.pylori usually appears in a non-culturable coccoid form. H.pylori, like other organism sampled in the oral microflora, gives false positive PCR result and many different microorganisms are also cultured in the selective agar for H.pylori. Although Pytko Polonczk et al pointed out that the presence of H.pylori in oral cavity leads to failure of systemic chemotherapy and potential source of reinfection, many data suggest that oral cavity is a transient region and not a very important reservoir. The difference in opinion may be caused by the difficulty to identity H.pylori from the oral cavity.

It is well known that Candidiasis and Fusobacterium nucleatum are isolated frequently from denture plaque and Candida species adhere well to denture base made of acrylic resin. H. pylori adheres selectively to Fusobacterium nucleatum, it is possible that H. pylori can adhere to complex biofilm on the denture surface. Identification of Helicobacter pylori in denture plaque and its correlation with peptic ulcer.

A. Ozdemir et al detected H.pylori in dental plaques and tongue scrapings of patients with chronic gastritis using campylobacter like organism (CLO) test kit. However there was no information about the incidence of H.pylori in denture plaques.

The partially or completely edentulous patients often wear dentures and a majority of these patients do not keep their dentures clean by brushing or denture cleansers. This results in accumulation of plaque, stain and calculus on denture surfaces causing oral diseases and seems to cause peptic ulcer disease. Therefore oral health care, dental and denture plaque control should be a part of strategies to prevent oral diseases as well as peptic ulcer disease.

Iumas Waltim et al (2001) investigated that Candida albicans adheres firmly to denture base made of acrylic resin as compared to other microorganisms of denture plague. Species of fusobacterium have been identified as populous in denture plaque (Kenneth Shay 2000) Helicobacter pylori adheres selectively to fusobacterium nuclaeatum which adheres selectively to candida albicans (Anderson 1998). Therefore Helicobacter pylori adheres to complex biofilm on the denture surface and seems to translocate to gastric region causing peptic ulcer disease. In thus study, we investigated the incidence of H. pylori in denture plaque for the prevention of peptic ulcer disease.

MATERIAL AND METHODS

Thirty one denture wearers, 20 women and 11 men with a mean age of 67.6 years were used. All patients wore complete or partial denture every day and not

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following denture cleansing methods prior to the Sampling. The fitting surface of the denture was rinsed by sterile water to remove saliva on the denture plaque. Denture plaque was swabbed from the surface with a sterile cotton bud and transferred to a campylobacter like organism (CLO) test kit.

Results were assessed on the presence of preformed urease produced by H. Pylori in denture plaque samples. The samples were placed in urea broth or agar. Growth of the organism hydrolyzed urea in the broth with the production of ammonium ions. This resulted in a rise in pH which could be detected by a color change of the indicator. Phenol red was used and a color change from yellow brown to pink was considered positive.

RESULTS

Table Details of the subjects and PGR

Sex	Age	Gastric History		PGR result
F	85	n.p.		-
F	89	n.p.		-
F	87	n.p.		-
F	86	n.p.		-
M	87	n.p.		-
M	80	Gastric Ulcer		-
F	79	n.p.		-
M	81	n.p.		-
M	91	Ch. gastritis	(1996/7)	-
M	81	Ac. gastroenteritis	(1997/11)	-
M	78	n.p.		-
F	83	Gastric ulcer	(1996/7)	-
F	80	n.p.		-
F	84	n.p.		-
F	80	n.p.		-
F	85	n.p.		-
F	92	n.p.		-
M	96	Gastric ulcer	(1996/7)	-
M	83	n.p.		-
M	90	n.p.		-
M	89	n.p.		-
F	95	n.p.		-
F	95	n.p.		-
F	73	n.p.		-
F	83	n.p.		-
F	93	Gastric ulcer gastric polyp	(1996/7)	-
F	78	n.p.		-
F	85	Gastric ulcer	(1996/7)	-
F	90	Gastric ulcer	(1996/7)	-
M	70	Chronic gastritis	(1996/7)	-
F	82	Duodenal ulcer	(1996/7)	-

We detected H.pylori in 11 of 31(35.52) patients. The specimens of all of these patients were urease positive. The H.pylori diagnosed (gastric history) patients were 15. The 10 specimens (32.3%) of peptic ulcer patients were urease positive and 15 specimens (48.4%) of patients without gastric history were urease negative. More correlation was found between H. pylori positive and their gastric history

DISCUSSION

The oral cavity has been suggested as a reservoir of H. pylori and a potential source of re-infection. Our results confirm that H. pylori exists in denture plaque and it can be detected using CLO test kit. The dentures were made from acrylic resin. Many microorganisms adhere well to acrylic resin. Candida albicans adheres and accumulates to denture base made of acrylic resin as compared to other microorganisms of denture plaque. Multiple innocuous and pathogenic bacterial varieties have been identified in denture plaque including Fusobacteria, E.coli, K.Pneumonia, Alpha strep; Beta strep; Group D. strep; and assorted gram (-) rods. If oral and denture hygiene is poor, more denture plaque accumulates and candida albicans and Fusobacterium nucleatum increase on the surface. Helicobacter pylori which adhere selectively to F. nucleatum increase in denture plaque and may translocate to gastric region. It is concluded that a denture can act as a potential reservoir for H.pylori which causes peptic ulcer disease. Therefore, oral health care, dental and denture plaque control should be a part of strategies to prevent oral diseases us well as peptic ulcer disease.

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