ABSTRACT

Aims: To assess the effects of black tea and green tea on teeth and its Periodontium among dental students at Liaquat College of Medicine and Dentistry (LCMD) Karachi, Pakistan. Material and methods: A cross sectional study conducted from November 2012 to January 2013 involving 218 adult volunteers attending LCMD. A total of 240 subjects consulted in this survey and 218 (90.5%) fulfilled the inclusion criteria and participated in the study. To access the reason of taking black tea and green tea and their effects on oral health we analysed the Community Periodontal Index Treatment Need (CPITN) index and Plaque Index on participants. Results: Results have shown that most of the female participants drinking green tea as compare to male participants. The most common reason of drinking black tea is Addiction on the other hand health conscious is the key reason of drinking green tea. End of the study we found health gums of those participants who taking green tea (x² = 36.57, df= 6, p<0.001) while those participants who taking black tea have more plaque accumulation (x² = 30.98, df= 6, p<0.001). Conclusion: The study concludes that green tea have some positive effects on Periodontium and helps to prevent plaque deposition.

Keywords: Black Tea; Dental students; Green Tea; Periodontal Health

Introduction

Tea, a beverage consumed around the world, has progressed from casual beverage to medicinal powerhouse through the centuries.1 There are several different types of tea available on the market, including green, black, white, herbal, and oolong. Gingivitis and periodontitis, as the multifactorial diseases, are mainly derived by interaction between invasions of causative bacteria and host immune response of varied degrees.2 Plaque induced gingivitis is the most common form of gingivitis and is induced by accumulation of microbial plaque containing more than 300 types of bacterial species.3 This study was conducted to assess the effects of black tea and green tea on teeth and its Periodontium among dental students at Liaquat College of Medicine and Dentistry (LCMD) Karachi, Pakistan.

Material and Methods

The Department of Community Dentistry and Periodontology of the Liaquat College of Medicine and Dentistry in Karachi, Pakistan organized free dental checkups among dental students at LCMD. The examination was done at the Darul Sehat hospital from November 2012 to January 2013. The dental students come from all area of Karachi and Pakistan that provided the opportunity for conducting this cross-sectional study. The exercise did not include acute consultations due to pain or infections and was restricted to intraoral examination and advice to the participants on how to improve and maintain their oral health. Participants were also informed on the presence of plaque and/or need for dental scaling.

A total of 240 subjects aged 19-27 years consulting for check-ups were invited to participate in the study. Exclusion criteria included self-reported diabetes, self-reported hypertension, self-reported complaints of bleeding gums, having received radiation therapy, having clinical signs of oral carcinoma, and history of pan and/or betel nut use. From the group of eligible subjects, five because they presented with diabetes or hypertension, and 14 were not included because of pan and/or betel nut consumption. A total of three individuals did not want to participate in the study thus leaving 218 (90.5%) volunteers. The dimensions of tea investigated included the type of tea taken (black or green tea), the duration of green tea consumption in years (<5 years, 5 to 9 years, 10 to 14 years and >14 years), and the reason for drinking tea. A subject was considered as a tea drinker if she/he taken at least one cup every day. No attempts were made to identify ex-tea taker.

The sample size estimated for the study (n=218) was originally calculated considering a precision of 5%, a 95% level of the confidence interval, and assuming a 50% prevalence in the underlying referral population. The study protocol was approved by the Department of Research and Ethics of the Liaquat College of Medicine and Dentistry Karachi and a written informed consent was collected from each participant. All participants filled a self-administered questionnaire containing information on age, gender, smoking status (current smoker/no smoker); the duration of smoking in years (<5 years, 5-9 yrs, 10-14 yrs and >14 yrs); and the type of cigarettes smoked (with or without filter).

A trained final year dental student (AA) and a dentist (MN) had completed all clinical examinations. The examiners were blinded to information on tea habits. Each participant was examined for the presence of plaque on the tooth surface: 1) No plaque on tooth surface; 2) plaque present less than 1/3 surface of tooth; 3) plaque present 1/3 surface of tooth; and 3) plaque present more than 2/3 surface of tooth; and gum status: 1) healthy gums; 2) bleeding gums; 3) calculus present surrounding gums and 4) periodontal pocketing present. For the purpose of the present analysis, the site with most effective was considered at the individual level.

Statistical Analysis: The data collected were analysed by χ² statistics to compare overall differences between groups, the differences between proportions and the corresponding 95% confidence intervals for the differences between groups.
Results

The study group comprised 118 green tea drinkers and 58 black tea drinkers and 42 non-tea drinkers who don’t like to drink tea at all. We were examined plaque index and CPITN index of all participants. According to the following study most of the females like to drink green tea (106/174) on the other hand, most of the males like to drink black tea (31/44).

Periodontal health status: Based on CPITN index green tea drinkers have more healthy gums (66.95%), as compared to black tea drinkers who has more bleeding gums (31.03%). (Table 1).

Plaque accumulation: Based on plaque index, green tea drinkers has highest numbers of participants with no plaque (72.38 %), on contrary the black tea drinkers had highest number of participants with plaque present on 1/3 tooth surface (40.30%). The absence of plaque was significantly associated with the drinking habit of green tea (x2 = 30.98, df= 6, p<0.001) (Table 2).

Reason for tea drinking: Based on this study data most of the participants are drinking green tea because they are health conscious (76.30%). On the other hand the main reason for drinking black tea is addiction (44.80%).

Duration of Tea drinking vs. Periodontal Health Status:
Based on CPITN index, the highest number participants who have healthy gum were drinking green tea for last 10 to 14 years (78.05%). Similarly second highest are those who drink green tea between 5 to 9 years (77.78%). (x2 = 25.42, df= 6, p<0.001).

Duration of Tea drinking vs. Plaque accumulation: Based on plaque index, the highest numbers of participants who have no plaque accumulation are those who drink green tea for last 10 to 14 years (82.93%). Similarly second highest are between 5 to 9 years (78.05%). (x2 = 25.42, df= 6, p<0.001).

Discussion

This study was conducted at Liaquat College of Medicine and Dentistry and Darul Sehat hospital is situated in south Karachi to assess reason of taking tea and their effects on oral health. Oxidative stress plays an important role in the pathogenesis of periodontal disease, as well as many other disorders.4-6

Tea originated in China, possibly as long ago as 2700 BC. For thousands of years, tea has anecdotally been considered to have health-giving properties; this has been amply confirmed in recent years by an accelerating research effort.7

The most abundant components in green tea are polyphenols, in particular flavonoids such as the catechins, catechin gallates and roanthocyanidins.7 The fresh leaves contain caffeine, theobromine and other methylxanthines, lignin, organic acids, chlorophyll and free amino acids, in addition to the unique amino acid theanine; numerous ‘flavour compounds’ are also present in much lower amounts.7,8

Bacterial biofilm development in the marginal gingiva and periodontal pockets is important in the pathogenesis of periodontal disease.9 Previous in vitro studies showed that green tea catechin inhibits the growth of Porphyromonas gingivalis, Prevotella intermedia, and Prevotella nigrescens and the adherence of P. gingivalis onto human buccal epithelial cells.4,10,11 In addition, green tea catechins with major tea polyphenols, inhibit the production of toxic end metabolites of P. gingivalis.6,11,12 These reports of the inhibitory effects of catechin contained in green tea on periodontal pathogens may provide the basis for the beneficial effect of the daily intake of green tea on periodontal health.7,6

Conclusion

In conclusion, the health consciousness is the main reason for taking green tea in Pakistani student population. Green tea takers presented less plaque accumulation as compare to black tea takers and the relationship suggested a dose-response effects.

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Effects of Black Tea and Green Tea on Periodontal Health Status

References

How cite this article

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