## Original Article

# Uncompensated Tooth loss in Cardiac Patients of Punjab Institute of Cardiology, Lahore

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## Abstract

**Objective:** To observe replacement of missing teeth with artificial teeth in subjects with and with out cardiac diseases and find its possible association with coronary heart diseases (CHD).

**Methodology:** Consecutive patients aged 20 and above with coronary heart disease and accompanied healthy subjects with tooth loss were examined for oral prosthesis after having a verbal consent, over a one month period in a cross-sectional study at Punjab Institute of Cardiology, Lahore. Chi-square and T- test were applied to analyze variables in subjects with and without coronary heart disease.

**Results:** Among 1694 subjects found with tooth loss, 1473 (86.95) subjects had no oral prosthesis; 817 (87.37%) were among the 935 cardiac patients and 656 (86.42%) among 759 healthy subjects. Oral prosthesis was found in 86 (8.05%) males and 32 (5.11%) females with coronary heart diseases. Of the healthy population, 46 (4.30%) males and 57 (9.10%) females had oral prosthesis. Statistical association for prosthesis was insignificant among cardiac patients and healthy subjects.

**Conclusion:** No association of uncompensated tooth loss with cardiac diseases was observed in this study. Although a large majority of cardiac patients and healthy subjects were observed with uncompensated tooth loss which was statistically insignificant (JPMA 59:3; 2009).

## Introduction

Cardiovascular diseases, a rapidly growing problem around the world; share 31% burden of 47% deaths due to non-communicable diseases in the Eastern Mediterranean region.[1] Pakistan is among the countries with high mortality rates in the region, and cardiac disease data reported in Pakistan shows a rise from 7 patients during 1944-48 to 100,000 in the year 2002.[2]

Important risk factors as an unhealthy diet (Low fruit and vegetable intake) and lifestyle are contributing to 31% of cardiac diseases globally.[3] Psychosocial factors (Anger, social isolation, depression) are reported to be associated with increased morbidity and mortality from coronary heart diseases.[4] Sedentary lifestyle (72%) is reported to be an important contributing factor for coronary heart disease in Pakistani people.[5]

A healthy mouth is a premise for overall health. When oral health is compromised, overall health can be affected.[6] Having less than 20 natural teeth is taken as indicator of poor oral health.[7] Cross-sectional studies,[8,9] showed a significant association between missing teeth and cardiovascular diseases. Overwhelming amount of information is available in current literature on the association of poor oral health and tooth loss to cardiac diseases.[10] Relative risk of 1.23 is reported for MI in edentulous persons as compared to dentate people and incidence of CHD in relation to less number of teeth with RR of 1.32 as compared to persons with more teeth.[11]

Tooth loss has been marked as physical impairment and disability.[12] Poor oral health affects mortality, general health, nutrition, digestion, social activities, quality of life and well-being;[13] and impact of poor oral health (Pain, xerostomia, halitosis, and unattractive dentition) on oral functions (chewing, smile, attraction) leads to poor self-esteem, social isolation, and depression.[14] Effects of loss of teeth on physical, psychological, and social life and impacts of chewing ability, talking to people, daily activities, self-esteem, and oral health related quality of life (OHRQoL) have been reported in the literature.[15,16] These studies may guide us to develop a concept that tooth loss itself and later on its non-replacement (uncompensation) could contribute to factors (psycho-social, stress) which are otherwise associated with development of cardiovascular diseases.

This study attempted to observe the replacement of missing teeth with artificial teeth in subjects with and without cardiac diseases and find its possible association with coronary heart diseases (CHD).

## Patients and Methods

Consecutive cardiac patients aged 20 and above diagnosed with coronary heart disease (CHD) admitted at Punjab Institute of Cardiology during the month of April

2004 were included in the study. Presence of artificial teeth (oral prosthesis) was noted at bedside with the help of a mouth mirror and tweezers. Healthy individuals, who accompanied the cardiac patients as attendants and agreed to be included in the study, were also examined for comparison purpose. Verbal consent of the subjects was obtained. Age and gender of subjects was noted as demographic variables.

Presence of prosthesis was analyzed in the total study population using SPSS version 11.5. Analysis was done by grouping study subjects into cardiac and non-cardiac groups and males and females. Summary statistics was calculated through descriptive analysis; Chi-Sq was applied for comparison of groups for oral prosthesis. T-test was applied for calculation of mean of age.

## Results

A total of 935 cardiac patients (20-88 years) with mean age of 51.96±11.94 years and 759 healthy individuals (20-85 years) with mean age of 49.79±11.98 years were among the total 1694 study subjects. There were 1068 (63.14%) males and 626 (36.95%) females. Of the cardiac patients, 665 (71.12%) were males and 270 (28.87%) were females, while 403 (53.09%) males and 356 (46.90%) females were among healthy subjects (Table 1).

**Table 1: Summary Statistics of CHD and Healthy subjects.**

| Variable | CHD N (%) | Healthy N (%) | Total | p-value |
|---|---|---|---|---|
| Study population | 935 (55.14) | 759 (44.80) | 1694 | --------- |
| Age-range | 20-88 yrs | 20-85 yrs | 20-88 yrs | |
| Mean Age (yrs) | 51.96 ±11.94 | 49.79±11.98 | | 0.0001 |
| **Genders** | | | | |
| Males | 665 (71.12) | 403 (53.09) | 1068 (63.4) | 0.0001 |
| Females | 270 (28.87) | 356 (46.90) | 626 (36.95) | |

Significance = p<0.05

**Table 2: CHD and Healthy subjects compared for prosthesis.**

| Variable | CHD 935 | Healthy 759 | Total 1694 | p-value |
|---|---|---|---|---|
| **Prosthesis** | | | | |
| Yes n (%) | 118 (12.65) | 103 (13.57) | 221 (13.04) | p>0.05 |
| No n (%) | 817 (87.37) | 656 (86.42) | 1473 (86.95) | |
| **Males (n=1068)** | | | | |
| Prosthesis Yes n (%) | 86(8.05) | 46(4.30) | 132(12.35) | |
| Prosthesis No n (%) | 579 (54.21) | 357 (33.42) | 936(87.64) | p>0.05 |
| **Females (n=626)** | | | | |
| Prosthesis Yes n (%) | 32 (5.11) | 57(9.10) | 89 (14.21) | |
| Prosthesis No n (%) | 238(30.01) | 299(47.76) | 537(85.78) | p>0.05 |

Significance = p<0.05

Table 2 presents data of oral prosthesis in study subjects. Of the study population 1473 (86.95%) had no artificial replacement for their missing teeth. Whereas 118 (12.65%) cardiac patients and 103 (13.57%) healthy subjects had artificial teeth. Statistical association for prosthesis among cardiac patients and healthy subjects was insignificant.

Among CHD genders, prosthesis was found in 86 (8.05%) males and 32 (5.11%) females and 46 (4.30%) healthy males and 57 (9.10%) healthy females had artificial teeth. Statistical association for oral prosthesis among CHD and healthy genders was also insignificant.

## Discussion

Tooth loss is associated with poor diet intake, malnutrition, loss of self-sufficiency, and deterioration in quality of life.[17,18] Tooth loss can substantially affect chewing ability, health-related quality of life and nutrition.[19,20] Subjects without oral rehabilitation may suffer from "effects & impacts" of tooth loss in terms of oral infection, physical, psychological, social life, daily activities, self-esteem that may contribute to stress and hypertension[12,15,21] leading to CVD. These associations of cardiac diseases and tooth loss (working through physical, psychological, social and dietary/nutritional factors) may have an indirect association with prevalence of oral prosthesis. This postulated association between uncompensated tooth loss and cardiac diseases was investigated in this study.

The study found a high number of subjects with uncompensated tooth loss in both cardiac and healthy populations, however, no statistically significant difference was observed between subjects with and with out artificial teeth in both the cardiac and non-cardiac individuals. These findings are in coherence with the national findings where the prosthetic need in the community is 93% for the 35-44 year old age group and 81% in the elderly.[22]

Although studies[8,10,11] report an association of poor oral health, tooth loss and higher levels of periodontal disease with increased risk of CHD, no association between incidence of oral prosthesis and cardiac diseases has been reported. This study reports a similar result.

## Conclusion

In this study no association of uncompensated tooth loss with cardiac diseases was observed. Large majority of the study subjects were found without oral prosthesis, cardiac subjects showed a slightly higher percentage in lack of prosthesis; but this difference was statistically insignificant.

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