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Research Article

Awareness Regarding the Effects of Periodontal Diseases on Coronary Heart System among Cardiologists in Tabriz, Iran

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Abstract

Background and aims. Periodontal disease is common among adults and is a potential source of chronic inflammation. Recent data have suggested an important role for chronic inflammation in the development of coronary heart disease (CHD). The purpose of this study was to address cardiologists' knowledge regarding the effects of periodontal diseases on coronary heart system.

Materials and methods. A cross-sectional study was designed for cardiologists in Tabriz, Iran. A total of 54 cardiologists participated in the study. Each participant was given a self-administered questionnaire. It was a closed-ended questionnaire with responses presented as yes/no/don't know choices. Data were analyzed using descriptive statistics.

Results. Cardiologists' knowledge about periodontal disease was moderate. Eighty-two percent of cardiologists agreed that inflammation is a key component between periodontal disease and CHD; 76% agreed that controlling infection and inflammation is important for managing CHD and 62% reported not receiving any education on oral healthcare. Eighty percent of cardiologists believed that medical and dental students should be trained to work collaboratively.

Conclusion. It is important for educators and administrators in higher education to examine the need for interprofessional education and collaboration between medicine and dentistry.

Key words: **Awareness, coronary disease, periodontal disease.**

Introduction

According to the World Health Organization (WHO), cardiovascular disease is the main cause of death worldwide.[1] Many risk factors for coronary heart disease (CHD) have been identified, but a significant proportion of coronary heart disease (CHD) cases have not been yet explained by traditional risk factors. Recently, evidence has implicated chronic inflammation in CHD and cardiovascular disease (CVD).[2]

Periodontitis is a bacteria-induced, chronic in-

flammatory disease that destroys supporting tissues and bones surrounding the teeth. A dentist or a periodontist diagnoses periodontal disease (PD) clinically by measuring variables such as tooth loss, recession, clinical attachment loss, periodontal pocket probing depth, tooth mobility and radiographic bone loss.[3-6] Periodontal disease is associated with elevations of several markers of chronic inflammation.[7-12] Since evidence has implicated chronic inflammation in the etiology of CHD, an etiologic relationship has been hypothesized between periodontal disease and coronary heart disease.[2] For these reasons, there has been strong interest in evaluating whether periodontal disease is independently associated with CHD.

Coronary heart disease and periodontal disease have many similar contributing risk factors such as smoking, diabetes, and obesity. [4, 13-14] It has been reported that periodontal disease is a direct pathway for which the two diseases could be related. Mucci et al[15] reported that inflammatory mediators that react in response to periodontal pathogens could have a possible effect on the systemic inflammatory response to the development of atherosclerotic plaque.

Periodontal infections might be pathways to CHD though bacteremia or inflammatory mediators provoked in response to the pathogen. Therefore, this systemic inflammatory response may result in the development of atherosclerotic plaque.[1]

de Oliveira et al[16] conducted a survey to measure if self-reported tooth brushing and oral hygiene are related to an increase in CVD. The results indicated that individuals with poor oral hygiene had higher risk of cardiovascular disease.

A meta-analysis focused on prospective cohort studies conducted in the general population. The aim of this meta-analysis was to determine the relationship between PD and coronary heart disease. This analysis also reported that biological markers such as C-reactive proteins serve as indicators of additional coronary heart disease (CHD). It reported that PD results in approximately 24-35% of increase in risk for CHD.[17]

With a potential effect from PD to increase the risk for CVD, it is important for the dental and medical professions to collaborate to help reduce the risk of adverse consequences for patients. Also, it is important to assess the current knowledge and practices of healthcare practitioners regarding oral systemic diseases.

Owens et al[18] studied 1,000 internists and 115 endocrinologists to determine their knowledge, opinions and practice behaviors regarding periodontitis and diabetes. Their study obtained a 34% response rate. Knowledge about periodontal disease was high and the respondents agreed that physicians should be taught about periodontal disease, being trained to screen for periodontal disease. The majority of respondents indicated that there is a relationship between periodontal disease and diabetes; however, most of them were not familiar with studies regarding the relationship between the two diseases.

Wooten et al[19] studied 404 nursing practitioners and certified midwives to determine their knowledge, opinions and practice behaviors in relation to periodontal disease and adverse pregnancy outcomes. Study results indicated that nurses and certified midwives had limited knowledge about oral health.

Although there is some evidence about the existence of relationship between PD and CHD, little is known about medical providers' knowledge of this relationship. The purpose of this study was to evaluate the knowledge of cardiologists about CHD and PD.

Materials and Methods

A cross-sectional survey was designed to assess cardiologists' knowledge regarding the relationship between cardiovascular disease and periodontal disease in Tabriz, Iran from July 2012 to June 2013. The study protocol was approved by the Ethical Review Committee of Tabriz Faculty of Dentistry.

A list of cardiologists was obtained from the Medical Council. The selection criteria included cardiologists practicing full time or part time in a public, private or government practice. Retired and pediatric cardiologists were excluded from the study and 54 cardiologists were selected. The subjects were asked to complete a questionnaire. It was a closed-ended questionnaire with responses presented as yes/no/don't know choices. The validity of the questionnaire was approved by three faculties and the reliability of questionnaire was determined via Cronbach's alpha. It was certified that this questionnaire has the ability to measure cardiologists' awareness level about periodontal diseases. The final questionnaire was then prepared with a cover letter stating the title and purpose of the survey. The first part of the questionnaire recorded demographic data (age, sex) followed by questions as shown in Table 1. Results on categorical measurements were presented in number (%).

Results

Fifty cardiologists agreed to participate in the study and filled the questionnaire. The average age of par-

ticipating cardiologists was 39.70±9.7 years.

Cardiologists' knowledge of periodontal disease was moderate. The majority of cardiologists agreed that inflammation is the key component between PD and CHD (82%). Seventy-six percent agreed that controlling infection and inflammation is important for managing CHD. When asked about their knowledge of studies regarding an association between CHD and PD, 54% of respondents agreed and the rest did not have enough information about this. Eighty-eight percent of respondents agreed that patients with periodontal disease are more likely to have increased atherosclerosis and risk of myocardial infarction and stroke (Table 1). Over half (76%) of respondents agreed that treatment of PD could decrease a patient's risk for cardiovascular diseases. The majority of physicians agreed (80%) that it is important for cardiologists' and periodontists to collaborate to teach their patients about oral systemic disease risks (Table 1).

A total of 34% of respondents reported that their professional education included oral health content. However, 62% reported receiving no education on oral healthcare; 3% reported having clinical requirements regarding assessments of the teeth or gums while only 1% reported observing a dentist or dental hygienist. Overall, 80% of cardiologists believed that medical and dental students should be trained to work collaboratively (Table 1).

Discussion

Studies have shown that individuals who have cardiovascular disease and periodontal disease share many of the same risk factors such as smoking, diabetes, obesity and age.[13-15,17-23.]

Oral microflora and their byproducts can gain systemic access via the circulatory system. Studies of carotid endarterectomy samples have found common periodontal pathogens from arterial plaques.[24,25] When gaining systemic access, oral microbes have the potential to directly influence subclinical mediators of cardiovascular events such as hypercoagulability, atherosclerotic development or both. Atherosclerosis has a strong inflammatory component[26,27] and epidemiologic evidence suggests that increased levels of systemic inflammation are predictive of cardiovascular events.[28,29]

People with periodontal disease have elevated levels of systemic inflammatory markers, such as C-reactive protein,[30] and treatment for periodontal disease has been reported to decrease systemic inflammation levels.[31] There are many potential triggers for this enhanced systemic inflammatory response, including transient bacteremia and the local release of bacterial byproducts such as lipopolysaccharide.[32] According to this evidence there is an association between periodontal and cardiovascular disease; therefore, the purpose of this study was to evaluate the knowledge and opinions of cardiologists regarding the relationship between CVD and PD.

In some studies other healthcare providers have been questioned about their knowledge regarding the etiology of periodontal disease; most have some knowledge of the bacteria and their detrimental effects. For example, a recent study of internists and endocrinologists showed that physicians knew that bacteria are the etiologic agents for PD (86%) and bone loss around teeth is a sign of PD (77%). Sixty-six percent knew that bleeding gums were a first sign of periodontitis. But the physicians also thought that tooth decay was a sign of gum disease (30%).[18]

In the current study 60% reported bleeding gums as the first sign of periodontitis; 57% of cardiologists

Table 1. Cardiologists' opinions about periodontal disease and systemic health

	Yes	No	Don't know
Inflammation is a key component between periodontal disease and cardiovascular disease.	41 (82%)	3 (6%)	6 (12%)
Good oral health is important to the rest of the body.	39 (78%)	2 (4%)	9 (18%)
I am knowledgeable regarding the studies linking periodontal disease and cardiovascular disease.	27 (54%)	5 (10%)	18 (36%)
Patients with periodontal disease are more likely to have increased atherosclerosis and risk for myocardial infarction.	44 (88%)	5 (10%)	1 (2%)
Controlling periodontal infection and inflammation is important for managing cardiovascular disease.	38 (76%)	6 (12%)	6 (12%)
Patients diagnosed with cardiovascular disease are more likely to have periodontal disease.	33 (66%)	6 (12%)	11 (22%)
Treatment of periodontal disease can decrease a patient's risk for cardiovascular disease.	35 (70%)	5 (10%)	10 (20%)
It is important for cardiologists and periodontists to work together to educate their patients on these diseases.	40 (80%)	9 (18%)	1 (2%)
We have professional education, including oral health content in the curriculum.	17 (34%)	31 (62%)	2 (4%)
We have clinical requirements regarding assessments of the gums or teeth.	3 (6%)	35 (70%)	12 (24%)
We have received clinical experience with dentists or dental hygienists.	1 (2%)	35 (70%)	4 (8%)
Medical and dental students should be trained to work collaboratively.	40 (80%)	5 (10%)	5 (10%)
I usually ask about dental or oral problems from patients with cardiovascular disease.	8 (16%)	42 (84%)	-

also thought that tooth mobility was a sign of periodontitis. Most studies of other healthcare providers have reported that they view their oral health education in professional school as being poor and they are interested in learning more about oral disease.[18,19,33]

In a study entitled "Awareness regarding the systemic effects of periodontal disease among medical interns in India", only 23 (16%) respondents were aware that the periodontal disease may be the possible risk factor for coronary heart disease, and only 12 respondents (8%) would seek dentist's opinion for all patients with systemic diseases related to dental disease. Medical interns had inadequate knowledge regarding the systemic effects of periodontal disease. Therefore, an integrated teaching of medical and dental sciences was recommended.[34]

In another study about evaluation of knowledge of the association between periodontal disease and preterm births among general medical practitioners and gynecologists 56.4% of general practitioners and 63% of gynecologists reported there was a relationship between periodontal disease and pre-term low birth weight.[35]

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In our study %88.3% of the cardiologists suggesteds that periodontal diseases increases the risk of coronary diseases in the mentioned patients mentioned above. Our study concluded that only 16% of cardiologists' ask their patients about dental or oral problems from their patients. The reason is that they simply do not know what it entails. This is an area that could be incorporated into medical school education through interprofessional education. Wilder et al. [36] recommends that faculty development, curricular changes and interprofessional education (IPE) initiatives be incorporated into dental education. Dental schools should seek relationships with local clinics and private practice dentists and other health professionals. Lopes et al. [37] reported that 79% of diabetes educators did not receive any formal education on oral health. Our study showreported similar findings and concluded that while the majority of respondents did not receive oral health education, they believed it is an important area for students to work collaboratively. An IPE curriculum would provide the atmosphere for collaboration to occur. To provide the best care and practices for our patients, it is in the best interest for multidisciplinary fields to join forces and work together.

Seminars and interactive workshops can be organized for the medical practitioners by dental researchers to create awareness on this field. Publishing articles or reports related to these in medical journals may also prove useful. Therefore, it is recommended that more space be allocated to the subject of dental sciences in the medical curriculum to improve physicians' ability to contribute to oral health and attentionstress be directedgiven toward integrated teaching of medical and dental sciences in order to trainproduce thorough professionals who can serve the humanity in a better way.

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