Relationship Between Periodontal Disease (Periodontitis) and Major Vascular Events. A Case-Control Study. Enperiva Studio

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Abstract
        Introduction: Periodontal and vascular disease share not only risk factors such as smoking and diabetes, but also a complex and multifactorial process of chronic inflammation. Materials and Methods: We carried out "case-control study". The cases were included in a non-randomized manner and they have to had a major vascular event at entry. Results: The proportion of patients with periodontitis was significantly higher in cases than in controls (p = 0.02). The presence of gingivitis was almost the same in both groups (p = 0.99). Conclusions: The present study demonstrated that not only periodontal disease is strongly associated with major vascular events but also that it was independent of traditional risk factors for vascular disease.

Keywords: Periodontal disease, periodontitis, major vascular events, acute coronary síndrome.

Introduction
        Periodontal disease (PD) is characterized by a pattern of chronic infection and inflammation of the structures that support the teeth, where

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complex relationships between risk factors such as smoking, genetic factors and bacteria are imbricated. Most of the inflammatory expression can be measured by clinical parameters as well as increased plasma levels of INF-γ, IL-10, IL-6 (Humphrey , et al., 2008) (Lockhart , et al., 2012).

Many risk factors for vascular disease have been identified, but a significant proportion of vascular events are not explained by them. Recently, several lines of evidence have implicated chronic inflammation as etiologic process in vascular disease. The former could also be measured by plasma level of some mediators such as IL-10, IFN- γ, IL-6 (Liu , et al., 2014).

Thus, periodontitis and vascular disease share not only risk factors such as smoking and diabetes, but also a complex and multifactorial process of chronic inflammation (Bahekar , et al., 2007;) (Ross, 1999).

Materials and methods

We carried out "case-control study". The sample size was calculated in at least 28 patients for each group (α error of 5% and study power of 80%). The cases were included in a non-randomized manner and they have to had a major vascular event at entry. The groups were matched by age (± 5 years), gender and classic risk factors such as hypertension, diabetes, dyslipidemia, parental history of myocardial infarction, physical inactivity, current or remote smoking and BMI (± 3 kg/m3). Inclusion criteria for cases: patients admitted to the Intensive Care Unit with major vascular event (i.e: acute coronary syndrome, ischemic stroke); aged> 21 years; patients who were not on taking vitamin or mineral supplements in the past 3 months and the presence of at least 7 teeth. Inclusion criteria for controls: Patients admitted to the Intensive Care Unit or General Ward with diagnosis other than major vascular event; aged> 21 years; patients who were not on taking vitamin or mineral supplements in the past 3 months and the presence of at least 7 teeth. Exclusion criteria: patients with cancer diagnosis; patients with cirrhosis or active chronic hepatitis diagnosis; patients with chronic autoimmune inflammatory diseases; patients on periodontal treatment in the last 3 months; pregnant or lactating women and patients who received antibiotics within the last 3 months.

Procedures: (1) Medical and dental record; (2) Clinical dental parameters: bleeding on probing; periodontal pocket depth; clinical attachment level; the plaque index (PI) and gingival index (GI); (3).

Results

A total of 62 individuals were included, being 30 cases and 32 controls. Among cases, 28 patients experienced acute coronary syndrome (ACS). The mean age of the cases was 60.10 ± 8.93 years and the controls

60.53 ± 8.97 years (p = 0.85). There were not significant diference between groups in terms of smokers (p=0.15), hypertension (p = 0.77), DLP (p = 0.45), DBT (p = 0.59), sedentary lifestyle (p = 0.99), TbqR (p = 0.99), BMI (p = 0.76), number of teeth (p = 0.54); Af (p = 0.54) (Table 1)

Table 1: Baseline comparisons between groups

Variables	Cases n (%)	Controls n (%)	OR (CI95%)	P*
Age (years)	60,10±8,93	60,53±8,97		0,85
Hypertension	17(56%)	17(53%)	1,15 (0,42-3,14)	0,77
Dyslipidemia	12(40%)	16(50%)	0,66 (0,24-1,82)	0,45
Diabetes	12(40%)	10(31%)	1,46 (0,51-4,17)	0,59
Sedentary Lifestyle	15(50%)	16(50%)	1 (0,36-2,70)	1
Smoking	12(40%)	6(19%)	2,66 (0,84-8,46)	0,15
Remote Smoking	12(40%)	12(37%)	1,11 (0,39-3,08)	1
Parental history myocardial infarction	8(26%)	6(19%)	1,57 (0.47- 5,23)	0.54
BMI Kg/m3	27,31±4,99	27,79±6,23		0,76*

* T test was used for independent samples and Chi2 test for dicotomus variables

The proportion of patients with PD was significantly higher in cases than in controls (p = 0.02). The presence of gingivitis was almost the same in both groups (p = 0.99). There were significant diference in plaque índice (PI) and gingival índice (GI) between these two groups (PI: 1.74 ± 0.64 (cases) vs 0.99 ± 0.69 (controls), p <0.01; GI: 1.61 ± 0.66 (cases) vs. 0.98 ± 0.55 (controles), p <0.01) (Table 2).

Table 2: Periodontal disease between groups

Variables	Cases n (%)	Controls n (%)	OR (CI95%)	p
Periodontal disease	21(70%)	13(40%)	**3,41**(1,19-9,76)	0,02
Gingivitis	26(86%)	27(84%)	1,20 (0,29-4,98)	1
GI (1)	1,61±0,66	0,98±0,55		<0,01*
PI (2)	1,74±0,64	0,99±0,69		<0,01*

* T test was used for independent samples; (1) Gingival Index; (2) Plaque Index.

Conclusion

The present study demonstrated that not only periodontal disease is strongly associated with major vascular events but also that it was independent of traditional risk factors for vascular disease.

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