COMPARATIVE ANALYSIS OF SUBGINGIVAL MICROBIOTA BETWEEN INDIVIDUALS WITH CHRONIC PERIODONTITIS AFFECTED OR NOT BY TYPE 2 DIABETES MELLITUS

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Clear evidences have shown that there exists a bidirectional relationship between diabetes mellitus and periodontal disease. The former, in fact, represents a risk factor for the onset of the latter, which is therefore called “the sixth complication” of diabetes. Conversely, periodontal disease is able to affect the diabetes regulation, conditioning its systemic impact.

Many hypothesis have been made to explain the influence of diabetes over periodontal disease. Among them, some authors have suggested that diabetes may influence the subgingival microbiota. Even though some evidence supports this hypothesis, it still remains barely investigated. A better comprehension of this aspect could lead to more targeted therapeutic strategies.

The aim of this study was to compare the prevalence and bacterial load of six main periodontal pathogens among chronic periodontitis patients with or without type 2 diabetes mellitus.

After selecting 20 diabetic patients (test group), a retrospective trial has been developed with a group ratio 1:1, using as matching variable the extension and severity of periodontal damage.

Data were obtained from the Periodontal and Implantology Division database at Bologna University.

Inclusion criteria were: diagnosis of chronic periodontitis, diagnosis of type 2 diabetes mellitus (only for the test group), presence of at least 12 teeth, age higher than 18 years, and caucasian race.

Patients were excluded if they were pregnant or lactating, required systemic antibiotics within 3 months prior to the microbiological testing or anti-inflammatory therapy in the month before the visit, if they were suffering from any other systemic disease except diabetes mellitus (arthritis, ulcerative colitis, Crohn’s disease, osteoporosis or osteopenia, HIV infection, hematologic diseases, neoplastic diseases, cardiovascular diseases or other pathologies that could potentially interfere with the periodontitis and/or with diabetes), if they suffered from mental disorders and/or had received periodontal treatment in the 6 months before the microbial test.

The microbiological data were recorded during the first visit and obtained by means of a quantitative real-time-PCR. The bacterial load of each species, the total bacterial load of the single periodontal site, and the percentage of pathogens compared to the total load were analyzed.

The bacterial pathogens examined were: Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Treponema denticola, Fusobacterium nucleatum and Tannerella forsythia.

The study protocol was previously approved by the Ethics Committee Bologna-Imola. (Reference Number: EC 16044)

The 2 groups resulted balanced in terms of demographic and clinical parameters, except for suppuration.

The diabetic patients were 9 Female and 11 Male with a mean age of 56.5 ± 9 years while non-diabetic patients (10 female, 10 male) had a mean age of 49.5 ± 14 years.

In the microbiological test sites (4 for each patient) the mean probing pocket depth was 6.33 ± 1.62 mm in diabetic patients and 6.42 ± 1.77 in non-diabetic patients, while sites with suppuration were 5 in the test group and 25 in the other.

All diabetics were subjected to a metabolic control regime (metformin, insulin and/or diet control). The 65% of them suffered of diabetes for less than 15 years.

Results show that diabetic patients had significantly greater amount of total bacterial load, red complex (Porphyromonas gingivalis, Treponema denticola and Tannerella forsythia) and Fusobacterium nucleatum (p<0,05). Comparing to the total bacterial load, only Tannerella forsythia maintained its prevalence in diabetic patients (p=0,0001).

This retrospective study supports the hypothesis that microbiological differences exist between periodontal subjects affected and not by diabetes mellitus.

Further investigations on broader samples and larger bacterial range are recommended.