Periodontitis is associated with Diabetic Macular Edema in early stages of Diabetic Retinopathy

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INTRODUCTION

Periodontitis is considered the 6th complication of diabetes mellitus. Diabetic retinopathy has been used to document progression of diabetic disease. While diabetic retinopathy correlates well with the duration and progression of diabetes, diabetic macular edema can occur at any stage and like periodontitis has a strong inflammatory component in its pathogenesis. Despite the high prevalence of the two diseases data concerning the concomitance of diabetic macular edema and periodontal disease is lacking.

PATIENTS AND METHODS

Patients were recruited at the Medical University Graz. Macular edema was documented by optical coherence tomography. Periodontal status was assessed by florida probe and panoramic x-ray. Periodontal inflamed surface area (PISA) was calculated to quantify intraoral inflammatory burden.

RESULTS

45 patients (11 female) with diabetic macular edema were enrolled. Average age was $62,47 \pm 10.43$. Patient characteristics and periodontal parameters are shown in table 1. PISA was significantly higher in early stages of diabetic retinopathy than in late stages despite different plaque levels.
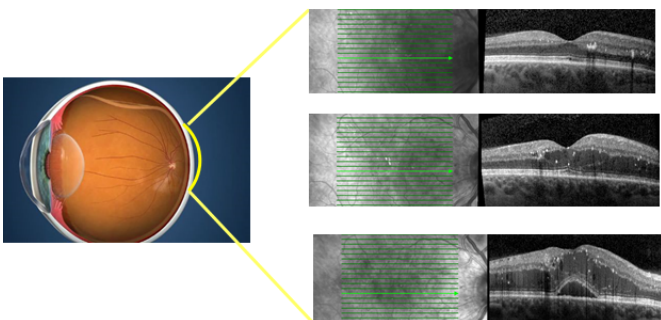

Figure 1. Diabetic macular edema. On the left side the location of the macula in the eye is shown. On the ride side there are 3 Optical Coherence Tomography pictures of the same patient at different time points. In the top picture there is no macular edema and the patient has 100% visual acuity. In the middle picture there is some edema and the patient has 50% visual acuity. In the bottom picture there is pronounced macular edema and the visual acuity is 32%.
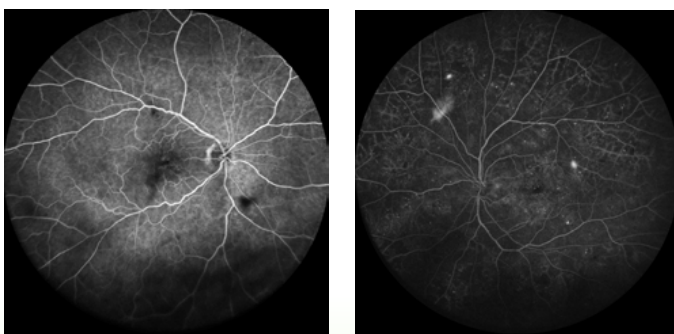

Figure 2. Stages of diabetic retinopathy. The left picture shows a patient with mild diabetic retinopathy. Only very few small whit spots (microaneuryms) are detectable. On the right side a patient with proliferative retinopathy is depicted. A big white spot is indicating a neovascularistaion. Notice the darker picture on the right side due to a reduced perfusion because of diabetic vasculopathy.
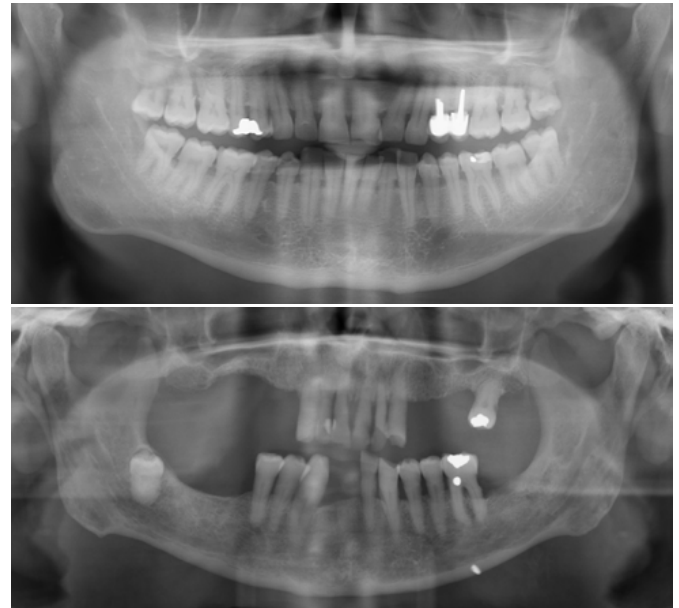

Figure 3. Panoramic x-ray of a patient with severe, proliferative diabetic retinopathy without clinical attachment loss shown on the top vs. an OPG of a patient with mild, non-proliferative diabetic retinopathy showing advanced clinical attachment loss shown above.

	Mild	Moderate	Severe	Proliferative	p-value
Age	64.6±9.5	67.6±10.3	56.5±9.1	59.1±10.8	0.13
Duration of Diabetes	16.9±9.7	16.4±10.0	11.0±12.7	19.5±11.8	0.75
HbA1c	7.4±1.3	7.1±1.0	7.2±0.0	7.4±1.2	0.96
Plaque Index	65.4±18.4	65.9±17.5	64.3±14.4	63.7±18.0	0.99
Bleeding on Probing	55.8±28.4	73.5±22.6	41.3±26.2	32.9±22.2	0.004
Number of teeth	20.6±5.4	22.6±3.7	27±4.1	23.6±4.8	0.1
PISA	410.5±221.6	563.1±300.0	315.8±201.0	288.7±183.0	0.04
PESA	928.0±302.2	1265.2±411.8	1027.3±118.9	910.0±197.8	0.03

Table 1. Patient characteristics and periodontal parameters grouped for grades of diabetic retinopathy.
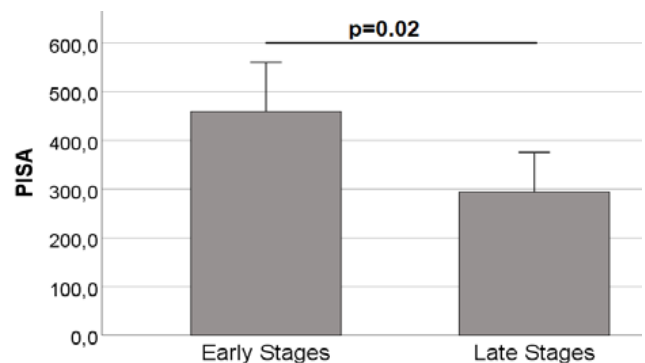

Figure 4. PISA was significantly higher in patients with early stages of diabetic retinopathy (mild and moderate) vs late stages (severe and proliferative).

CONCLUSION

Inflammatory pathways triggering complications like diabetic macular edema and periodontal disease are more important in early stages of disease while in late stages vasculopathy gains pathogenic overweight. Therefore, patients with diabetic macular edema in early stages of diabetic retinopathy should be screened for periodontal disease