Diagnosed duration of type-2 diabetes mellitus and periodontitis

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INTRODUCTION

Diabetes Mellitus has significant impact upon tissues throughout the body, including the oral cavity.

DM, especially when poorly controlled, increases the risk for periodontitis.
• **Duration of DM - associated with periodontitis**

  (Glavind et al. 1969)

• **Duration of DM - not associated with periodontitis**

  (Sandberg et al. 2000, Alpagot et al. 2001)
Epidemiological and clinical aspects of periodontal disease in diabetics

W. Aubrey Soskolne
Annals of Periodontology (1998) 3:3-12

For both IDDM and NIDDM there does not seem to be any correlation between the prevalence or the severity of periodontal disease and the duration of diabetes.
Bradford Hill Criteria for Causal Interpretation – Risk Factors

Consistency of association
Strength of association
Time sequence correct
Specificity of associations
Degree of exposure (Dose-Response Effect)
Biologic plausibility
Supported by experimental evidence
OBJECTIVES

To assess the association between diagnosed duration of type-2 DM and periodontal status
METHODS

Subjects
Type-2 Diabetic Patients
Age 40-70 years
Attending an out-patient Diabetic Clinic at Tung Wah Eastern Hospital
At least one tooth per sextant
METHODS

Exclusion criteria
Smoking
Pregnancy
Receiving antimicrobial therapy in previous 6 months
Receiving periodontal therapy in preceding 6 months
Requiring antibiotic prophylaxis for periodontal probing
Incomplete patient records
METHODS

Clinical Examination: One calibrated examiner
Manual probing

Oral Hygiene Index (Greene & Vermillion 1960)
  - Debris Index (DI)
  - Calculus Index (CI)
Gingivitis Index (GI) (Jackson 1965)
Probing pocket depth (PPD)
Probing attachment level (PAL)
METHODS

Diagnosed duration of type-2 DM

Determined from patients’ clinical records on day of examination
METHODS

(Diabetic) Metabolic Control

Determined from patients’ %HbA$_1$C on day of examination

Good: ≤ 7.1%
Fair: 7.2 – 8.3%
Poor: > 8.3%

Ko et al. 1998
METHODS

**Independent t-tests:** differences between group means

**Pearson correlation coefficient:** associations

**Fischer’s exact test:** differences in prevalence between groups
METHODS

Ethical Approval

Ethics Committee, Faculty of Dentistry, The University of Hong Kong

Ethics Committee, Tung Wah Eastern Hospital

Written consent
RESULTS

Patients

172 type-2 DM
Non-smoking
Age: 56 (±8.9) years
Females: 52.6%
On Diabetic Medications: 63.5%
RESULTS

Mean No. Missing Teeth: 6.6 (±4.7)

Periodontal status

Mean

GI: 1.7 (±0.5)
DI: 1.6 (±0.5)
CI: 1.5 (±0.6)
PPD: 2.5 (±0.9) mm
PAL: 3.5 (±1.2) mm

Severe Periodontitis (Tsai et al. 2002)
2 sites PAL ≥ 6mm
- 71%
RESULTS

Diagnosed duration of type-2 DM

6.3 (±5.2) years

55% ≤ 5 years
RESULTS

Correlations, controlling for sex and age:

DM duration with mean GI
\[ r=0.152, \ p<0.05 \]

DM duration with mean PAL
\[ r=0.171, \ p<0.01 \]
RESULTS

Correlations of DM duration and periodontal conditions by metabolic control groups:

Good (n=91): Mean %HbA$_1$C = 6.4 (±0.6)
Fair (n=68): Mean %HbA$_1$C = 7.6 (±0.3)
Poor (n=49): Mean %HbA$_1$C = 9.7 (±1.7)

Good –

DM duration with mean GI: r=0.29, p<0.05
DM duration with mean PPD: r=0.22, p<0.05
DM duration with mean PAL: r=0.277, p<0.05
Mean GI by DM Duration
≤5 or >5 years

$p < 0.004$
Mean PAL by DM Duration
≤5 or >5 years

$p<0.01$
RESULTS

Proportion with ‘Severe Periodontitis’ (≥2 sites with PAL ≥6mm) by DM duration (categorized)

≤5 years: 83/125 (66%)
>5 years: 42/53 (79%)*

*P > .05
RESULTS

DM duration (categorized) and metabolic control

≤5 years: %HbA₁C=7.2
>5 years: %HbA₁C=7.9*

*P<0.01
CONCLUSION

Type-2 DM diagnosed duration controlling for age and sex, and accounting for metabolic control, was associated with periodontitis

- current gingival status
- periodontal attachment loss experience
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