

Scientific release from the EFP
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Study:

Effect of obesity on periodontal attachment loss progression: a five-year population-based prospective study

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Relevant background:

Recent systematic reviews and meta-analyses have demonstrated a positive association between obesity and increased incidence and prevalence of

periodontitis. However, individual studies have been heterogeneous in design and there is variation in the reported odds ratios for the association.

Aims:

The aim of this prospective study was to evaluate the effect of obesity and of being overweight on the progression of periodontal attachment loss. This investigation is part of a larger research study investigating epidemiology of periodontal diseases in Porto Alegre, Brazil. A cross-sectional investigation

of this study population (Della Vecchia et al. 2005) previously reported a significant association between obesity and periodontitis in females, particularly among non-smokers. This study reports on the five-year follow-up of this sample.

Methods:

In 2001, a representative sample of 1,586 individuals were interviewed and clinically examined. Subsequently, a proportion (n=755; 47.6%) were re-examined and re-interviewed in 2006/2007, of whom 582 individuals met the inclusion criteria of ≥ 6 teeth, no history of diabetes, BMI $\geq 18.5 \text{ kg/m}^2$, and for whom all data was available from both examinations (2001 and 2006/7).
At baseline, participants were interviewed using a structured written questionnaire that included questions on socio-demographics, medical and dental history, and behavioural variables. The questionnaire was adapted for a new interview five years later to assess any changes in the exposure to risk factors over this period.

Participants were weighed and measured and body mass index (BMI) was calculated using the WHO criteria. All permanent teeth (excluding third molars) were examined at six sites per tooth and periodontal parameters recorded. Reproducibility of interviews and clinical examinations were evaluated using kappa coefficients.
Regression analysis was conducted to estimate the relationship between periodontal attachment loss (PAL) and BMI. Stratified analyses were conducted to assess if any such association was modified by gender or smoking status.
PAL progression over the five-year period was the primary outcome. Cases were defined as individuals having experienced proximal PAL $\geq 3 \text{ mm}$ in ≥ 4 teeth over the five years of follow-up.

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Results:

- 30% and 19% of the sample were classified as overweight (BMI 25-29.9 kg/m²) and obese (BMI ≥ 30 kg/m²) respectively.
- PAL progression rate was 38% and it increased in a dose-response order with increasing BMI.
- Overall, obese individuals were significantly more likely to experience PAL progression than those of normal weight (RR= 1.36, 95% CI= 1.04-1.78.). This increased risk remained following adjustment for variables including sex, age, skin colour, education, socio-economic status, smoking, dental care, and oral prophylaxis.
- Stratification by gender revealed that obese females had a 64% higher risk of experiencing PAL progression than females of normal weight (RR= 1.64, 95% CI= 1.11-2.43). No statistically significant association was found between PAL progression and obesity for males.
- Findings for overweight individuals, both overall and by gender, were not statistically significant.

**Limitations,
conclusions
and impact:****Limitations:**

- The clinical examinations (baseline versus re-examination) were conducted by different teams of examiners. However, all examiners were calibrated.
- The initially enrolled sample was representative of the local population. However, it is less clear whether those participants who were re-examined (47.9%) accurately represented the sample demographics as a whole.
- The study used BMI as a measure of obesity. Utilising additional measures of body fat distribution might have increased the reliability of data.
- The questionnaires utilised self-reporting by patients. It is possible some participants were unaware of their diabetic status and that more subjects should consequently have been excluded from the analysis.

Conclusions:

- Within the population group studied, obesity appears to be a risk factor for PAL progression for females but not for males, even after adjusting for a number of confounding variables.
- Obesity did not significantly increase the risk of PAL progression in males.
- Overweight condition does not appear to be associated with PAL progression.

Impact:

- Dental professionals should be aware of a possible association between obesity and progression of periodontal disease in female patients.
- Counselling of obese female patients may be indicated to highlight the potential association of obesity with progressive disease as part of the control of modifiable risk factors.