

Studies on onset and lesion characteristics in periodontitis

Akademisk avhandling

som för avläggande av odontologie doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentlig förvaras i föreläsningssal 3, institutionen för odontologi, Medicinaregatan 12E, fredagen den 2 februari 2018, klockan 09.00

av

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leg. tandläkare

Fakultetsopponent:

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Avhandlingen baseras på följande delarbeten

- I. Thorbert-Mros S & Berglundh T (2010) Aggressive periodontitis in children: a 14-19-year follow-up. *Journal of Clinical Periodontology* 37:283-287.
- II. Thorbert-Mros S, Cassel B, Berglundh T (2017) Age of onset of disease in subjects with severe periodontitis: A 9- to 34 -year retrospective study *Journal of Clinical Periodontology* 44:778-783
- III. Thorbert-Mros S, Larsson L & Berglundh T (2015) Cellular composition of long-standing gingivitis and periodontitis lesions. *Journal of Periodontal Research* 50:535-544.
- IV. Thorbert-Mros S, Larsson L, Kalm J & Berglundh T (2018) IL-17 producing T-cells and IL-17 mRNA expression in periodontitis and gingivitis lesions. *Submitted*

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR ODONTOLOGI**



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Abstract

Will early forms of periodontitis in childhood predict future risk for severe periodontitis? At what age may onset of periodontitis be detected in subjects with severe periodontitis? Are there differences in cell composition between lesions representing longstanding gingivitis and severe periodontitis?

In *study I*, 11 children (7–13 years) with localized aggressive periodontitis (LAP) were re-examined after 14–19 years. While bleeding on probing was a general finding in the group, only two of the subjects exhibited recurrence of disease with probing pocket depth ≥ 6 mm and 3–4 mm of bone loss at several teeth. The age of onset of disease in 42 patients, 30–45 years of age, diagnosed with severe, generalized periodontitis was assessed in *study II*. The earliest age at which a radiographic examination revealed distance between the cement-enamel junction (CEJ) and alveolar bone crest (BC) ≥ 3 mm (F3) at any site was recorded, as well as the highest patient age at which a radiographic examination revealed absence of sites with CEJ-BC ≥ 3 mm (L0). Onset of disease, i.e. the interval between L0 and F3, occurred on the average between 22 and 28 years. In *study III* and *IV* differences between lesions representing longstanding gingivitis and severe periodontitis were analyzed. Gingival biopsies were collected and prepared for histological examination and RT-qPCR analysis. Periodontitis lesions were twice as large as gingivitis and contained significantly larger proportions and higher numbers of plasma cells and macrophages than gingivitis lesions. T cells were not the dominating cell type in gingivitis lesions, as B cells together with their subset plasma cells comprised a larger number and proportion than T cells. In addition, the total number and density of IL-17 producing T cells were larger and expression of IL-17mRNA was higher in periodontitis than in gingivitis lesions.

Conclusions:

Children treated for LAP do not always exhibit recurrence of periodontitis in the absence of supportive periodontal therapy over periods of 14–19 years. Disease in the current sample of 30–45 year-old subjects with severe, generalized periodontitis, commenced mainly between 22 and 28 years of age. Large number and high density of plasma cells are the hallmarks of advanced periodontitis lesions and the most conspicuous difference in relation to longstanding gingivitis lesions. IL-17 producing T cells represent a significant feature in the detection of differences between destructive and non-destructive lesions.

Keywords: [periodontitis, onset, lesion characteristics, plasma cells, IL-17]