



European Society of Endodontology

ESE Research Grant: Endodontic infections and systemic health 2016

The European Society of Endodontology (ESE) has provided extra funds to support research projects on endodontic health and systemic disease.

Award 40,000 Euros to Pirkko Pussinen



Project Title: Endodontic infections, inflammation and coronary artery disease

The general aim of the study is to investigate how endodontic infections are associated with the recurrence and outcome of coronary artery disease. This follow-up study will include clinical and radiographic oral examination of the survivors as well as identification of the non-survivors through linkage to the National causes-of-death records.

Pirkko Pussinen started her research in the field of dentistry in 2000, and the primary goal has been to investigate oral infections as a risk factor for cardiovascular diseases. In her research group she has aimed to combine the know-how of dentists, biochemists, molecular biologists, epidemiologists, and physicians. As a scientist she sees herself as a mediator between biosciences and dental / medical research integrating the evidence produced by laboratory sciences to clinical practice, and acquiring open research questions from the clinical practice into the laboratory.

The research group published recently that endodontic lesions are associated with an increased risk of coronary artery disease (Liljestrand *et al.* 2016). They demonstrated in the cross-sectional Parogene-cohort that periapical lesions and apical rarefactions was associated with an increased risk of acute coronary syndrome with an OR of 2.46 (95% CI 1.09-5.54, $p=0.016$). The association was independent of age, gender, smoking, diabetes, body mass index, number of teeth, and alveolar bone loss as a proxy for periodontitis. Similar association was especially noteworthy in patients with apical rarefactions in teeth that were not previously endodontically treated (OR 2.72, 1.16-6.40, $p=0.022$).

Award 40,000 Euros to Thomas Kvist



Project Title: Do root fillings and apical periodontitis increase the risk of a first myocardial infarction?

Negative events attributed to cardiovascular disease, such as myocardial infarction and stroke, are the leading causes of death in Europe. Smoking, diabetes, hypertension and obesity are well-established risk factors for cardiovascular disease.

The possible association between cardiovascular disease and inflammatory processes of endodontic origin has been debated for more than hundred years. However, evidence is poor and only a few scientific studies of good quality are available.

The prevalence of teeth with root fillings is estimated to 1- 2 root filled tooth per individual among adult populations in developed countries. However, epidemiological studies show signs of infection and inflammation, apical periodontitis, in association with root filled teeth at a frequency of 25- 50 %.

The association between marginal periodontitis and cardiovascular disease rests on a more solid scientific basis. A recent Swedish case-control study (Parokrank) of 805 patients diagnosed with their first myocardial infarction found an increased risk (OR 1.28) for a first myocardial infarction in individuals with marginal periodontitis.

A contemporary meta-analysis shows limited but consistent results regarding increased levels of inflammatory markers in association with apical periodontitis, stressing the similarities between apical periodontitis and periodontal disease.

After a signed agreement with the Parokrank-project group we have access to panoramic radiographs and stored 4 mL whole blood and 6 mL plasma from all PAROKRANK- patients and controls.

TWO SPECIFIC KEY QUESTIONS WILL BE ADDRESSED DURING OUR STUDIES:

1. Is the presence of root filled teeth and/or teeth with apical periodontitis an independent risk factor for a first myocardial infarction?
2. Do patients with a first myocardial infarction present with increased blood levels of CRP, IL-1, IL-2, IL-6, asymmetrical dimethylarginine, IgA, IgG, and IgM compared to controls and is this associated with presence of apical periodontitis?

Using the available panoramic radiographs, the following variables of primary interest will be recorded for each of the 805 myocardial infarct patients and age, gender and geographical area matched controls. 1. The number of remaining teeth. 2. The number of root-filled teeth. 3. The number of teeth with periapical bone destruction.

Frozen blood samples from all patients and controls are available at the Karolinska Institute. After agreement with the steering committee for Parokrank we can order analyses of the selected inflammatory markers. All recordings of data will be done by blinded observers and only just before statistical analyses the code for each patient or control will be disclosed and entered into the datasheet.

If our findings give support for a positive relation between endodontic and cardiovascular disease it may be causal and thereby open the way for further research of pathophysiological mechanisms. In a clinical

perspective endodontic disease should be prevented or cured, not only to improve dental health, but also to improve cardiovascular disease, as well.

Associate professor Thomas Kvist, DDS, PhD

Thomas Kvist has practiced general dentistry in Sweden and in Sorrento, Italy.

He completed specialization in endodontics in 1993 and received his PhD in 2001 at the Department of Endodontology, University of Gothenburg, Sweden where he is presently head and holding a position as Associate professor. For several years he was director of the postgraduate program and head of the Specialist Clinic for Endodontics at Public Dental Service in Gothenburg. He has published articles in peer-reviewed journals on decision-making and clinical outcome in endodontics. He also authored several textbook chapters. Thomas Kvist participated in the project group for the report *Methods of Diagnosis and Treatment in Endodontics* published in 2010 by the Swedish Council on Health Technology Assessment (SBU) and Swedish National Board of Health and Welfare's work to provide National guidelines for adult dental care. He is a member of the editorial board of the *International Endodontic Journal* and since more recently *Acta Odontologica Scandinavica*. Thomas Kvist is also a participant in the Endodontic Research Collaboration in Scandinavia (EndoReco).