

Thinking outside the box

Prof. Dr Liviu Steier investigates how dentistry can help and prevent dramatic cardiovascular diseases

Cardiovascular disease represents one of the leading causes of death in the Western world. With this in mind, it is interesting to note that the American Academy of Periodontology has just

informed its members of its new clinical recommendations developed in regards to arteriosclerotic cardiovascular diseases, which has been published in the *American Journal of Cardiology*.

In 2008, the Academy organised a workshop on inflammation. Shortly after this event, American periodontal disease experts met opinion leaders in cardiovascular medicine. The

American periodontologists presented scientific evidence which convinced the cardiologists that they needed to alert their fellow colleagues that they were able to help reduce the risk of cardiovascular diseases in patients suffering from periodontitis.

An important relationship

Here I will make a few points on the interrelation between periodontal and cardiovascular diseases.

Dental plaque may become colonised by periodontal pathogens such as:

- Porphyromonas gingivalis;
- Campylobacter rectus,
- Fusobacterium nucleatum,
- Bacteroides forsythus,
- Prevotella intermedia,
- Actinobacillus actinomycetem-comitans, for example.

Bacteria and its products reaching the gingival tissue stimulate inflammatory response leading to infiltration of neutrophils, lymphocytes, macrophages and mast cells. Inflammation is a well-established determinant for cardiovascular and periodontal disease.

Beside the inflammatory response an immune response of the body will be as well induced.

Interleukin-1 gene polymorphisms has been identified as a 'candidate that influences inflammation'.

Genetics today describes three IL-1 genes located on human chromosome 2q13. Polymorphism in these genes are described with variations in levels of IL-1, and IL-1ra.

Artherosclerosis is the consequence of arteriomateus plaque formation.

It has been demonstrated that bacteria in blood, during bacteraemia may induce platelet accumulation which will enmesh in fibrin, leading to a thrombus. An occlusive thrombus, or clot, obstructs the heart muscle's blood supply. Formation of an occlusive thrombus represents a life-threatening episode in coronary artery disease.

In their paper called, *Elevation of systemic Markers Related to Cardiovascular Diseases in the Peripheral Blood of Periodontitis Patients*, Loos et al. (JoP 2000) proved that: 'Periodontitis results in higher systemic levels of CRP (C-Reactive Protein), IL-6, and neutrophils.'

In his reappraisal on the topic of inflammation and periodontal diseases, Van Dyke draws the public's attention to the following:

'Inflammatory mechanisms appear to be critical factors in the development and progression of most of the chronic diseases in ageing.

- Diet and genetic variations interact to control differences in inflammation among individuals. Inflammation is actively resolved by specific mechanisms that help to restore homeostasis, and there ways to augment these processes.
- Although our genes do not change, the control of how certain genes are expressed in specific tissue can change substantially throughout our lives by factors such as diet, stress, and **bacterial accumulation**.
- Visceral fat accumulations around one's waist substantially increase the inflammatory burden on the body.

- Over expression of inflammation may be one of the key aspects of aging that influences and links different diseases in different individuals."

Discussion

It would be a dramatic mistake for the dental profession to identify modern dentistry with Cosmetic Dentistry or Aesthetic Dentistry. Dentistry today is a pillar of human body's health. Dentists fulfil an extremely important role, and are a port to combat infection, inflammation and their consequences.

Patient education as well as inter-professional communication ('thinking outside the box') may help save our patients lives, and if they came trustfully into our dental practices it is our responsibility to help, advise and protect their health and life!

Conclusion

Continuing professional education today should contain understanding for infection, inflammation and its consequences for the human body.

Dentistry can help and prevent dramatic cardiovascular diseases. 