

Abstract

Periodontitis is a disease primarily affecting tooth attachment, i.e. concerning oral cavity, however, its connection to a number of systemic diseases is apparent nowadays. Oral microorganisms and their interaction with the immune system of their host play a significant part in the etiology of this multifactorial disease. Rapid development of DNA-based diagnostic methods in the last 15 years dramatically increased the spectrum of identified oral microorganisms and promoted understanding of how particular taxons correlate with periodontal health or disease. Moreover, next generation sequencing methods also bring new possibilities to study the relationship between periodontitis and other diseases such as diabetes mellitus, cardiovascular diseases (CVD), stroke, lung infection or kidney diseases, etc.

The presented work focuses on the use of sequencing methods to compare the taxonomic composition of microbiomes within oral cavity and the tissues of aortic valves in patients suffering from CVD. The characterisation of taxonomic composition of microbiome in the analysed tissues was performed using the method of 454 pyrosequencing of variable region IV-V of the bacterial 16S rDNA. The present taxons were determined by comparing the obtained sequences with the Human Oral Microbiome Database.

The common characteristic of both CVD and periodontitis is the development of inflammation. Intensive studies are being conducted on the correlation between periodontitis and inflammatory marker of C reactive protein (CRP). The American Heart Association considers CRP value determined using high sensitivity method (hsCRP) to be an important indicator which can classify a patient without any manifest CVD to a group with high cardiovascular risk, even in the absence of classic risk factors. Another objective of the presented work was the determination of CRP from capillary blood in patients with various extent of periodontal disease and assessment of the risk of developing CVD based on the extent of periodontal disease.

Interconnecting the results of laboratory and clinical phase of study should lead to a deeper understanding of relationship between periodontal pathogens on one side and initiation and progression of atherosclerotic changes on the other side. In the end it should result in improving the quality of health care provided to patients suffering from periodontitis and CVD.