

## Endodontic Infections: Risk for Cardiovascular Diseases??

This article was published in the following Scient Open Access Journal:

Journal of Dental and Oral Health

Received August 29, 2016; Accepted : September 22, 2016; Published : September 30, 2016

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Cardiovascular diseases (CVD) have a complex etiology which includes genetic component and environmental factors. For the development of CVD, low-grade chronic inflammation plays a determining role in development of atherosclerosis [1,2]. Experimental studies have shown that upregulation of IL-1 activity favours the progression of atherosclerosis [3].

Both periodontal infections and endodontic infections have a similar and a complex microbiology and are associated with elevated cytokine levels [4]. Absence of epithelial barrier between the necrotic pulp and periapical tissues makes the spread of bacteria and inflammatory mediators more pronounced in contrast to periodontal infections [5].

Apical periodontitis occurs as a consequence to endodontic infection when the host defences give way to microbial factors [6]. Patients with apical periodontitis have three to tenfold greater amounts of IL-1 [4]. IL-1 $\beta$  is the predominant form of interleukin found in human periapical lesions and their exudates [7]. Periapical pathology leads to liberation of inflammatory mediators like IL-1, 6, 8 and 17 [4,8].

Endodontic surgical and non-surgical instrumentation of root canals can produce a transient bacteremia. However, it may also occur due to direct spread of endodontic bacteria into the bloodstream [9].

Even a small contribution to CHD development by endodontic disease might be important from a public health perspective. One review reported the presence of Lesion of Endodontic Origin in 14-70% of all participants and 0.6-8.5% of all teeth, with root-filled teeth evident in 22-78% of participants and 1.3-21.5% of teeth [10]. Lesion of Endodontic Origin are more common in root-filled than non-root filled teeth, and poorer-quality treatment has been associated with LEO (Lesion of Endodontic Origin) [10-12].

A more precise understanding of the connection between endodontic infection and inflammation and cardiovascular disease risk would be of great interest from a public health perspective. Only a more focused and rigorous scientific research can determine a definitive opinion on the relationship between endodontic disease and CVD.

### References

1. Stollberger C, Finsterer J. Role of infectious and immune factors in coronary and cerebrovascular arteriosclerosis. *Clin Diagn Lab Immunol.* 2002;9(2):207-215.
2. Naoum JJ, Chai H, Lin PH, Lumsden AB, Yao Q, Chen C. Lymphotoxin- $\alpha$  and cardiovascular disease: clinical association and pathogenic mechanisms. *Med Sci Monit.* 2006;12(7):121-124.
3. Bhaskar V, Yin J, Mirza AM, et al. Monoclonal antibodies targeting IL-1 beta reduce biomarkers of atherosclerosis in vitro and inhibit atherosclerotic plaque formation in Apolipoprotein E-deficient mice. *Atherosclerosis.* 2011;216(2):313-320.
4. Beck J, Garcia R, Heiss G, Vokonas PS, Offenbacher S. Periodontal disease and cardiovascular disease. *J Periodontol.* 1996;67(10):1123-1137.
5. Silva TA, Garlet GP, Fukada SY, Silva JS, Cunha FQ. Chemokines in oral inflammatory diseases apical periodontitis and periodontal disease. *J Dent Res.* 2007;86(4):306-319.
6. Nair PN. Pathogenesis of apical periodontitis and the causes of endodontic failures. *Crit Rev Oral Biol Med.* 2004;15(6):348-381.
7. Lim GC, Torabinejad M, Kettering J, Linkhardt TA, Finkelman RD. Interleukin 1-beta in symptomatic and asymptomatic human periradicular lesions. *J Endod.* 1994;20(5):225-227.
8. Stashenko P, Yu SM, Wang CY. Kinetics of immune cell and bone resorptive responses to endodontic infections. *J Endod.* 1992;18(9):422-426.

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9. Cotti E, Dessi C, Piras A, Mercurio G. Can a chronic dental infection be considered a cause of cardiovascular disease? A review of the literature. *Int J Cardiol.* 2010;148(1):4-10.
  10. Caplan DJ. Epidemiologic issues in studies of association between apical periodontitis and systemic health. *Endod Top.* 2004;8(1):15-35.
  11. Buckley M, Spangberg LS. The prevalence and technical quality of endodontic treatment in an American subpopulation. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1995;79(1):92-100.
  12. Ray HA, Trope M. Periapical status of endodontically treated teeth in relation to the technical quality of the root filling and the coronal restoration. *Int Endod J.* 1995;28(1):12-18.