

Embargo: Thursday 21 June 2018, 12:30 CEST

EuroPerio9 press release

Gum disease associated with high blood pressure

Reduction in hypertension found after periodontal therapy

Amsterdam, NETHERLANDS. 21 June 2018 – A study presented today at EuroPerio9, the world’s leading congress in periodontology and implant dentistry, found that periodontitis (gum disease) is associated with an increased likelihood of hypertension (high blood pressure) (1). Investigators also found a reduction in blood pressure levels after periodontal therapy.

Previous studies (2-4) have suggested a link between periodontitis and hypertension, but little was known about the direction of the association. The aim of this study was to ascertain whether patients with periodontitis were more likely to be diagnosed with hypertension compared to individuals without periodontitis. The systematic review also set out to investigate the effect of periodontal therapy on systolic and diastolic blood pressure.

According to the World Health Organisation (WHO), 1 in 5 adults (over 25 years of age) live with high blood pressure, while complications from hypertension account for 9.4 million deaths per year (5). Gum disease affects 743 million people (aged 15 to 99) worldwide (6).

Lead author Eva Munoz Aguilera, specialist in training Periodontology at UCL Eastman Dental Institute, London, UK, said: “Periodontitis and hypertension affect millions of people worldwide. Both conditions have been independently linked to the incidence of cardiovascular events (7,8), leading to major health problems and significant impact on health costs. Additionally, hypertension and periodontitis share risk factors such as diabetes, poor diet, and smoking.”

“Gum disease is a chronic multifactorial inflammatory disease caused by microorganisms that leads to severe inflammation and causes tooth loss. It impairs aesthetics and function and reduces quality of life. Additionally, there is growing evidence that gum disease increases the risk for future cardiovascular disease (9), independently of confounding factors such as smoking and obesity (10),” explained Dr Munoz Aguilera.

The aim of this systematic review was to examine the level of evidence available, linking these two conditions. “From a biological point of view this association is possible since the microorganisms causing inflammation in gum disease can create local as well as systemic inflammation, leading to damage in the blood vessels (11). We were interested in looking at the possibility of a more causal association between gum disease and blood pressure,” she continued.

Press and Media

Treatment of hypertension (with medication and life style changes) has been associated with a decreased risk of heart and vessel complications and improved general health (12). Similarly, the treatment of gum disease (via better oral hygiene and interventions such as non-surgical and surgical periodontal treatment by an oral health professional) leads to better oral health, with existing studies (13,14) also pointing to the reduction of systemic inflammation, including a decrease in the stiffness of blood vessels.

Dr Munoz Aguilera said: “If it is proven that there is a link between periodontal disease and hypertension, and that it is a causal one, this would give us opportunity to act in the diagnosis, prevention and treatment of gum disease in order to contribute, in turn, to the prevention and treatment of hypertension (15), avoiding the devastating complications caused by raised blood pressure.”

Commenting on the methods used, Dr Munoz Aguilera said: “Our systematic review included observational and interventional studies published until October 2017. A comprehensive search was conducted in MEDLINE, EMBASE, CENTRAL, LILACS and Web of Science, for observational and interventional studies. Two authors independently reviewed, selected and extracted data from the search conducted and assessed risk of bias. The primary outcome was adjusted odds ratio (OR) for hypertension in patients with periodontitis (moderate and severe groups). The secondary outcome included blood pressure changes after periodontal therapy. We also looked into studies beyond periodontology-hypertension, extending our search to papers on heart disease, metabolic syndrome and other chronic and systemic conditions linked to gum disease, retrieving blood pressure data of great value. What is new in our study is that we were looking at only one direction for the association: gum disease as a potential risk factor for hypertension. We excluded studies where hypertension was the exposure/independent variable.”

At the time of abstract submission, sixty-two studies fulfilled the inclusion criteria, of which 21 were considered for meta-analysis (three cohort, two case-control and sixteen cross-sectional studies). Results showed that the diagnosis of moderate to severe periodontitis was associated with 30 to 50% increased odds for high blood pressure (OR=1.30; 95% CI, 1.14-1.48) and when severe periodontitis was evaluated, an increased estimate was calculated (OR=1.54; 95% CI, 1.03-2.30). In cohort studies examining the association, periodontitis predicted the occurrence of hypertension (OR=1.41; 95% CI, 0.92-2.16). Bias assessment revealed a low (15 studies) to moderate (six studies) risk for all studies.

Regarding the secondary outcome Dr Munoz Aguilera said: “When we looked into studies reporting the effects of gum therapy on measures of blood pressure, we saw a trend towards a decrease in blood pressure after periodontal treatment. Two out of the three interventional studies included in the review confirmed a reduction in BP following periodontal therapy, ranging from an average of SBP=7-12 mmHg and of DBP=0-10 mmHg. This reduction points pretty much towards gum disease treatment reducing systemic inflammation.” She added: “According to the results, we estimate that the treatment of gum disease in patients with raised blood pressure could be in the range or even higher of what is expected with a blood pressure drug (12), so this is quite significant. Nevertheless these are early days.”

On the next steps, Dr Munoz Aguilera said: “We need more research (such as longitudinal studies and randomised controlled trials with blood pressure as the primary outcome) to confirm this effect. Because of the sample size required to conduct further research on this topic, these studies will be costly. We hope to join forces with other health professionals in order to continue our research.”

Press and Media

Regarding the nature of the association, Dr Munoz Aguilera said: “We can’t yet comment on this. We need further evidence from epidemiological and interventional studies to ascertain the mechanisms and nature of the association.”

Dr Munoz Aguilera concluded: “The implications of our findings are that we should raise awareness among health professionals, patients and policy makers that there is an association between gum disease and hypertension. Oral health advice should be given to all patients with hypertension as well as with other conditions associated with periodontitis, such as diabetes, pregnancy, etc. On the other hand, patients with periodontitis should be informed that there is a higher risk of developing hypertension and given advice on life style changes. So far, we know that prevention and treatment of periodontitis provides better oral, systemic health and improvement of the quality of life. Additionally, its treatment may help prevent/improve hypertension.”

- END -

Notes to Editors

Systematic review: A systematic review summarises the results of available, carefully designed, healthcare studies (controlled trials) and provides a high level of evidence on the effectiveness of healthcare interventions.

Meta-analysis: A meta-analysis is an analysis that combines the results of multiple scientific studies in a statistically meaningful way.

Periodontitis: a serious gum inflammation that damages soft tissue and destroys the bone that supports teeth. It can lead to tooth loss. Periodontitis is usually the result of poor oral hygiene and is largely preventable with good habits such as brushing teeth twice a day and cleaning regularly between the teeth.

Hypertension: (also known as high or raised blood pressure) is a condition in which the blood vessels have persistently raised pressure. Normal adult blood pressure is defined as 120 mmHg (systolic, when the heart beats) and 80 mm Hg (diastolic, when the heart relaxes). Most people with hypertension have no symptoms, which is why it is known as the “silent killer.” It is dangerous because it can lead to heart attack, stroke, kidney failure, blindness, and cognitive impairment.

References:

1. EuroPerio9 Abstract **PD061**, Periodontitis and its treatment are associated with Hypertension: a systematic review and meta-analysis. Presented at the Poster Discussion Session on 21 June at 13:45.
2. Martin-Cabezas, R., Seelam, N., Petit, C., Agossa, K., Gaertner, S., Tenenbaum, H., Davideau, J.L. & Huck, O. (2016) Association between periodontitis and arterial hypertension: A systematic review and meta-analysis. *American Heart Journal* **180**, 98-112.
3. Vilela-Martin, J. F. (2014) Is there an association between periodontitis and hypertension? *Current Cardiology Reviews* 10, 355-361.
4. Tsioufis, C., Kasiakogias, A., Thomopoulos, C. & Stefanadis, C. (2011) Periodontitis and blood pressure: the concept of dental hypertension. *Atherosclerosis* 219, 1-9.
5. WHO Q&A on hypertension: <http://www.who.int/features/qa/82/en/> (last accessed 6 April 2018)
6. Frencken, J. E., Sharma, P., Stenhouse, L., Green, D., Laverty, D. & Dietrich, T. (2017) Global epidemiology of dental caries and severe periodontitis—a comprehensive review. *Journal of Clinical Periodontology* 44.(Suppl. 18): S94–S105 doi: 10.1111/jcpe.12677 <http://www.efp.org/publications/jcp-open/jcpopen-2017-44-18-S94-S105.pdf> (last accessed 6 April 2018)
7. Sanz, M., D’Aiuto, F., Deanfield, J. & Fernandez-Avilés, F. (2010) European workshop in periodontal health and cardiovascular disease—scientific evidence on the association between periodontal and cardiovascular diseases: a review of the literature. *European Heart Journal Supplements* 12, B3-B12.
8. Mancia, G., Fagard, R., Narkiewicz, K., Redon, J., Zanchetti, A., Böhm, M., Christiaens, T., Cifkova, R., De Backer, G. & Dominiczak, A. (2013) 2013 ESH/ESC guidelines for the management of arterial hypertension: the

Press and Media

Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). Blood Pressure 22, 193-278.

9. Tonetti, M. S. & Dyke, T. E. (2013) Periodontitis and atherosclerotic cardiovascular disease: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases. Journal of Clinical Periodontology 40.

10. Kepschull, á., Demmer, R. T. & Papapanou, P. N. (2010) "Gum bug, leave my heart alone!"—epidemiologic and mechanistic evidence linking periodontal infections and atherosclerosis. Journal of Dental Research 89, 879-902.

11. Amar, S., Gokce, N., Morgan, S., Loukideli, M., Van Dyke, T. E. & Vita, J. A. (2003) Periodontal disease is associated with brachial artery endothelial dysfunction and systemic inflammation. Arteriosclerosis, Thrombosis, and Vascular Biology 23, 1245-1249.

12. Law, M., Morris, J. & Wald, N. (2009) Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies. BMJ 338, b1665.

13. Orlandi, M., Suvan, J., Petrie, A., Donos, N., Masi, S., Hingorani, A., Deanfield, J. & D'Aiuto, F. (2014) Association between periodontal disease and its treatment, flow-mediated dilatation and carotid intima-media thickness: a systematic review and meta-analysis. Atherosclerosis 236, 39-46.

14. Teeuw, W. J., Slot, D. E., Susanto, H., Gerdes, V. E., Abbas, F., D'aiuto, F., Kastelein, J. J. & Loos, B. G. (2014) Treatment of periodontitis improves the atherosclerotic profile: a systematic review and meta-analysis. Journal of Clinical Periodontology 41, 70-79.

15. Li, C., Wang, Y., Lv, Z., Jia, Y., Wang, S., Shi, Z., Chen, X. & Zhou, X. (2011) Effect of periodontal treatments on blood pressure. The Cochrane Library.

EFP Press Office Contact: press@efp.org

[About the EFP](#)

The European Federation of Periodontology (EFP) is an umbrella organisation of 30 national scientific societies devoted to promoting research, education and awareness of periodontal science and practice. It represents more than 14,000 periodontists and gum-health professionals from Europe, northern Africa, and the Middle East.

[About EuroPerio9](#)

EuroPerio is the world's biggest scientific meeting devoted to periodontology. The most recent of these triennial meetings, EuroPerio8, took place in London in June 2015 and brought together almost 10,000 people. EuroPerio9 will take place from 20 to 23 June 2018 at the [RAI](#), Amsterdam, The Netherlands.

Follow us on:

