Medical Xpress

A healthy mouth helps to maintain balanced metabolic profiles, finds study

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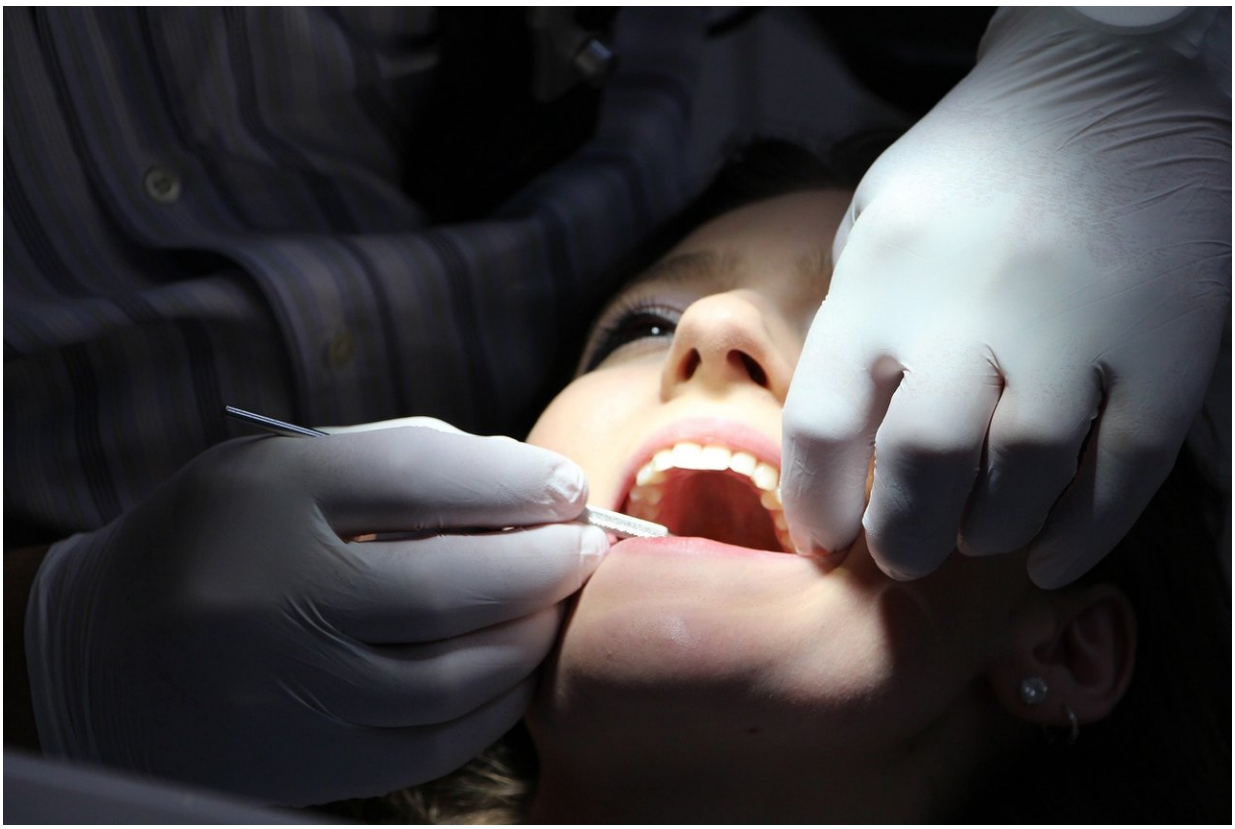

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Common oral infections, periodontal diseases and caries, are associated with inflammatory metabolic profiles related to an increased risk of cardiometabolic diseases, a new study by an international team of

researchers suggests. Oral infections also predicted future adverse changes in metabolic profiles.

The association between oral infections and adverse metabolic profiles was observed in the Finnish Health 2000/2011 and Parogene study cohorts.

"The observation is novel, since there are only few studies connecting extensive metabolic measures with oral infections, and no earlier prospective studies exist," says Professor Pirkko Pussinen from the University of Eastern Finland.

Published in the *Journal of Dental Research*, the study also involved researchers from the University of Helsinki, Karolinska Institutet and Medical University of Graz.

Progressed oral infections and inflammations—endodontic lesions and periodontitis—are known to be associated with an increased risk of cardiometabolic diseases. Although the mechanisms behind these associations are partially unclear, poor oral health is probably sustaining systemic inflammation.

The present study comprised 452 middle-aged and elderly Parogene patients and 6,229 participants of the population-based Health-2000 survey. In 2011, 4,116 Health-2000 participants provided a follow-up serum sample. Serum concentrations of 157 metabolites reflecting the risk of chronic diseases, such as lipid and glucose metabolites, ketone bodies and amino acids, were determined with an NMR spectroscopy method.

Parameters describing the oral health status were collected at baseline in clinical and radiographic examinations. They included those describing the periodontal status, such as bleeding on probing, periodontal probing

depth and alveolar bone loss. Caries-related parameters included root canal fillings, apical rarefactions and caries lesions. The study composed of a cross-sectional part analyzing the association between the metabolic measures with prevalent oral health, and of a prospective part examining whether oral infections predict the levels of metabolic measures in the follow-up.

Periodontitis especially linked to prevalent inflammatory metabolic profile, caries to future adverse metabolites

Among 157 metabolic measures, increased periodontal probing depth associated with 93, bleeding on probing with 88, and periodontal inflammation burden with 77 measures. Among the caries-related parameters, root canal fillings were associated with 47, inadequate root canal fillings with 27, and caries lesions with eight metabolic measures.

In the prospective analyses, caries was associated with 30 and bleeding on probing with eight metabolites. These metabolic measures were typical of inflammation, thus showing positive associations with fatty acid saturation degree and very low density lipoprotein (VLDL) parameters, and negative associations with high density lipoprotein (HDL) parameters.

"Oral infections may partially explain unhealthy lipid profiles," says Adjunct Professor Aino Salminen from the University of Helsinki.

More information: A. Salminen et al, Systemic Metabolic Signatures of Oral Diseases, *Journal of Dental Research* (2023). DOI: 10.1177/00220345231203562