

Microbes may play a role in heart attack onset

August 31 2019



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Microorganisms in the body may contribute to destabilisation of coronary plaques and subsequent heart attack, according to late breaking research presented today at ESC Congress 2019 together with the World

Congress of Cardiology.

The study found that unlike gut bacteria, the bacteria in coronary plaques were pro-inflammatory. In addition, patients with [acute coronary syndrome](#) ([heart attack](#)) had different bacteria in their guts compared to patients with stable angina.

Diet, smoking, pollution, age, and medications have a major impact on cell physiology, the immune system, and metabolism. Previous research indicates that these effects are mediated by microorganisms in the intestinal tract. This study investigated the contribution of the microbiota to the instability of coronary plaques.

The study enrolled 30 patients with acute coronary syndrome and ten patients with stable angina. The researchers isolated [gut bacteria](#) from faeces samples. Coronary plaque bacteria were extracted from angioplasty balloons.

Comparison of microbiota in faeces and coronary plaques revealed a different composition in the two sites. While faecal bacteria had a heterogeneous composition, and a pronounced presence of Bacteroidetes and Firmicutes, coronary plaques primarily contained microbes with pro-inflammatory phenotypes belonging to Proteobacteria and Actinobacteria.

First author Eugenia Pisano, of the Catholic University of the Sacred Heart, Rome, Italy said: "This suggests a selective retention of pro-inflammatory bacteria in [atherosclerotic plaques](#), which could provoke an inflammatory response and plaque rupture."

The analyses also revealed differences in gut microbiota between the two groups of patients. Those with acute coronary syndrome had more Firmicutes, Fusobacteria and Actinobacteria, while Bacteroidetes and

Proteobacteria were more abundant in those with stable angina.

Ms Pisano said: "We found a different make-up of the gut microbiome in acute and stable patients. The varying chemicals emitted by these [bacteria](#) might affect plaque destabilisation and consequent heart attack. Studies are needed to examine whether these metabolites do influence plaque instability."

She noted that to date, research has not convincingly shown that infections and the ensuing inflammation are directly involved in the process of plaque instability and [heart](#) attack onset. As an example, antibiotics against Chlamydia Pneumoniae failed to reduce the risk of cardiac events.

But she said: "While this is a small study, the results are important because they regenerate the notion that, at least in a subset of patients, infectious triggers might play a direct role in plaque destabilisation. Further research will tell us if antibiotics can prevent cardiovascular events in certain patients."

Ms Pisano concluded: "Microbiota in the gut and coronary plaque could have a pathogenetic function in the process of plaque destabilisation and might become a potential therapeutic target."

More information: The [abstract](#) "A different microbial signature in plaque and gut of patients presenting with ACS: a possible role for coronary instability" will be presented during the session Late Breaking Basic and Translational Science – Acute Coronary Syndromes and Heart failure on Saturday 31 August at 13:50 to 15:00 CEST in room Pristina – Village 3.

Provided by European Society of Cardiology

Citation: Microbes may play a role in heart attack onset (2019, August 31) retrieved 27 December 2023 from <https://medicalxpress.com/news/2019-08-microbes-role-heart-onset.html>

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