

How to avoid heart disease: brush your teeth, say scientists

September 10 2008

Bad teeth, bleeding gums and poor dental hygiene can end up causing heart disease, scientists heard today at the Society for General Microbiology's Autumn meeting being held this week at Trinity College, Dublin.

People with poor dental hygiene and those who don't brush their teeth regularly end up with bleeding gums, which provide an entry to the bloodstream for up to 700 different types of bacteria found in our mouths. This increases the risk of having a heart attack, according to microbiologists from the University of Bristol and the Royal College of Surgeons in Ireland.

"The mouth is probably the dirtiest place in the human body," said Dr Steve Kerrigan from the Royal College of Surgeons in Dublin, Ireland. "If you have an open blood vessel from bleeding gums, bacteria will gain entry to your bloodstream. When bacteria get into the bloodstream they encounter tiny fragments called platelets that clot blood when you get a cut. By sticking to the platelets bacteria cause them to clot inside the blood vessel, partially blocking it. This prevents the blood flow back to the heart and we run the risk of suffering a heart attack."

The only treatment for this type of disease is aggressive antibiotic therapy, but with the increasing problem of multiple drug resistant bacteria, this option is becoming short lived.

"Cardiovascular disease is currently the biggest killer in the western

world. Oral bacteria such as *Streptococcus gordonii* and *Streptococcus sanguinis* are common infecting agents, and we now recognise that bacterial infections are an independent risk factor for heart diseases," said Professor Howard Jenkinson from the University of Bristol. "In other words it doesn't matter how fit, slim or healthy you are, you're adding to your chances of getting heart disease by having bad teeth."

Researchers at Bristol have been investigating the ways in which the bacteria interact with platelets in order to develop new and improved therapies.

"Most of the studies that have looked at how bacteria interact with platelets were carried out under conditions that do not resemble those in the human circulatory system. We mimicked the pressure inside the blood vessels and in the heart", said Professor Jenkinson. "Using this technique we demonstrated that bacteria use different mechanisms to cause platelets to clump together, allowing them to completely encase the bacteria. This shields the bacteria from the cells of our immune systems, which would normally kill bacteria, and most importantly also protects them from antibiotics."

These findings suggest why antibiotics do not always work in the treatment of infectious heart disease and also highlight the need to develop new drugs to treat this disease. "We are currently in the process of identifying the exact site at which the bacteria stick to the platelets," said Professor Jenkinson. "Once this is identified we will design a new drug to prevent this interaction."

"We also identified several proteins on the bacteria that lead to platelet clumping," said Dr Kerrigan. "Genetic deletion of these proteins from the bacteria prevented the platelets from clumping which shows that these proteins play an essential role and may be candidate proteins for new drug development or producing vaccines."

Source: Society for General Microbiology

Citation: How to avoid heart disease: brush your teeth, say scientists (2008, September 10)
retrieved 24 January 2023 from <https://medicalxpress.com/news/2008-09-heart-disease-teeth-scientists.html>

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