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Talk to patients about cardiovascular disease

Don't be afraid – the time is right!

Decades of good epidemiological data show that poor oral health is associated with cardiovascular disease but until now there has been some doubt about whether there is a causative role. Cardiovascular diseases were the leading cause of death in Australia in 2014[1] for both men and women and the 2011 Australian burden of disease study[2] highlighted that about one-third (31%) of the total burden of disease in Australia was attributed to modifiable risk factors including - tobacco use, high body mass, alcohol use, physical inactivity and high blood pressure. By raising awareness about the effect of these risk factors, a large proportion of the Australians could lead healthier lives.

It is likely that the link between poor oral health and chronic disease is inflammation. A recent study, the CANTOS trial[3], establishes strong evidence that inflammation plays a significant role in the development of atherosclerosis – the early stage of cardiovascular disease. This missing piece of the puzzle now adds to the findings of previous clinical studies showing a link between periodontal diseases and cardiovascular disease. Gingivitis and Periodontitis are inflammatory diseases caused by the accumulation of oral bacteria. The presence of bacterial antigens and endotoxins cause epithelial and connective tissue cells to release inflammatory mediators. The extent of the resulting inflammatory response depends on both local and systemic factors, but when significant, will result in elevated levels of C-reactive protein (CRP). Raised CRP levels have been shown to occur even in otherwise healthy young individuals with induced gingivitis who were studied after ceasing oral hygiene measures for 2-3 weeks[4]. In these individuals, the significant increases in gingival bleeding were associated with a systemic increase in CRP and other inflammatory markers. The good news is that in this study, the return to good oral hygiene almost completely reversed the inflammatory process.

Together, the results of these two recent studies show us that poor oral health leads to chronic general inflammation mediated by CRP and that chronic general inflammation plays a significant role in the development of atherosclerosis. So using this knowledge, how can we help our patients to improve their oral health?

Cardiovascular disease and periodontal disease share many common risk factors.

Along with the other so-called "lifestyle diseases" such as obesity and diabetes, the risks can be divided into modifiable and non-modifiable. Studies show that people with unhealthy lifestyles tend to avoid preventive strategies for various reasons – either not recognising the risks or not feeling like they have any control. This is the case with cardiovascular disease.

When an individual believes that their health is determined by chance, family history or other factors beyond their control, their motivation for lifestyle change is low. This is termed "health locus of control". Another factor is the

long-term development of these diseases. For many, it is difficult to commit to changes in the younger years when the consequences of unhealthy lifestyles take a number of years, sometimes decades, to cause serious health problems.

This presents a tremendous opportunity for the dental profession to make a difference to the general health of the population while achieving the much needed gains in oral health. If we can begin the discussion about the links between poor oral health and heart attacks it helps people to see the connection and realise that they can control many aspects of their own general health. The simple step of improving oral health not only gives the benefits of lowering the risk of periodontal disease and caries but also it is very likely to reduce the risk for cardiovascular disease, including heart attack or stroke. Patients need to understand that the responsibility for health is in their hands and that the health professions are there to motivate, support and assist them in their efforts to live a healthy life. We need to show them that an easy risk factor they can control is keeping their mouth healthy.

Behavioural change takes time and perseverance but we are well-placed to start talking to patients when they are young and continue delivering healthy messages and support throughout patients' life stages. Research shows that receiving consistent messaging at both community and individual levels is the most effective way to bring about behavioural change[5].

In conclusion, there is nothing to lose and everything to gain by talking to our patients about the link between poor oral health and cardiovascular disease, this makes a compelling case for achieving and maintaining good oral health.

References:

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The CANTOS trial

This double-blind, randomised controlled secondary prevention trial was conducted in over 10,000 patients who had previously experienced myocardial infarction and were already receiving statin therapy for prevention of future cardio-vascular events. Statins work by lowering cholesterol and reducing blood Low Density Lipoprotein (LDL) levels. The patients selected in this trial had elevated C-reactive protein (CR-P) levels of ≥2mg/L despite their aggressive prevention strategies. This level of C-reactive protein indicates a persistent proinflammatory response.

The CANTOS study trialled the drug Canakinumab - an anti-inflammatory drug that has been used to treat rare auto-inflammatory conditions. It was taken by the test groups in addition to their statin therapy. Canakinumab has an effect on reducing C-reactive proteins (inflammatory markers) but not effecting plasma lipids.

Results showed that Canakinumab reduced the occurrence of myocardial infarction, stroke or cardio-vascular death by an additional 15% over the standard treatment with statins. These results provide strong support that atherosclerosis is an inflammatory disease and when added to all the experimental and clinical data accumulated over decades, a clear picture emerges.

Atherosclerosis results when LDL accumulates in areas of disturbed flow in arteries. Chronic inflammation and repair within arteries eventually leads to thrombosis. When macrophages accumulate large amounts of cholesterol from LDL particles they secrete IL-1B. CR-P is secreted in the liver in response to the presence of inflammatory cytokines such as IL-1B and have been shown to be an accurate marker of inflammation. Canakinumab acts on the inflammatory mediator IL-1B, indicating that chronic inflammation has a critical role to play in cardiovascular disease.