Nitric oxide (NO) is secreted by the endothelium and regulates function of the vascular barrier. Reduced NO availability is a hallmark of endothelial dysfunction. Dietary inorganic nitrate and vitamin C may boost NO availability.

Data synthesis of randomised controlled trials (RCTs) revealed significant improvement of measures of endothelial function after supplementation with inorganic nitrate and vitamin C. However, participant characteristics such as age, BMI and health status modified the effects of these interventions significantly.

I investigated the acute effects of a single dose of inorganic nitrate in human participants subjected to acute hyperglycaemia. This showed that nitrate produced greater improvements in biomarkers of inflammation and oxidative stress in older compared with younger participants. Conversely, greater improvement in biomarkers of endothelial function was observed in younger rather than older participants.

In my second RCT, I found that age modified the effects of vitamin C on systolic and diastolic blood pressure and on heart rate variability. Moreover, vitamin C significantly reduced arterial stiffness.

In conclusion, age, obesity and metabolic disorders modify the cardiovascular effects of inorganic nitrate and vitamin C.