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Amino acids may improve arterial health and blood pressure: Study

By Stephen Daniells+, 28-Jul-2015

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Increased intake of select amino acids may improve blood pressure and measures of arterial health in healthy women, says a new study from England.

Higher intakes of arginine, cysteine, glutamic acid, glycine, histidine, leucine, and tyrosine were associated with significant improvements in measures of peripheral and central blood pressure, according to scientists from the University of East Anglia and King's College London.

"These novel data suggest that intake of selected amino acids is associated with arterial stiffness and central blood pressure, with significant associations observed for [pulse wave velocity] and [central systolic blood pressure] similar in magnitude to established lifestyle risk factors for hypertension, such as physical activity, not smoking, and reduced intake of sodium and alcohol," wrote the researchers in the *Journal of Nutrition* .

"The intake of amino acids associated with lower arterial stiffness and central blood pressure is easily achievable in the habitual diet, making these findings very relevant for public health strategies to reduce cardiovascular disease risk."

The studyis epidemiological, and therefore shows correlation and not causation, and the findings *"highlight the need for more intervention trials examining dietary achievable intake of amino acids and cardiovascular outcomes"*, wrote the researchers.

Study details

Dr Amy Jennings and her co-workers analyzed data from 1,898 female twins aged between 18 and 75, and assessed the intakes of the seven amino acids deemed to be 'cardioprotective' using a food frequency questionnaire (FFQ). Arterial stiffness and atherosclerosis were measured using a number of methods, including central systolic blood pressure (cSBP), pulse wave velocity (PWV), mean arterial pressure (MAP), and intima–media thickness (IMT).

Results showed that higher intakes of all seven amino acids were associated with decreases in cSBP, PWV, and MAP, compared with the lowest average intakes. Total protein intakes were also associated with decreases in these measures, said the researchers.

In addition, the researchers found that the source of the protein had an impact on the markers of arterial health, with plant proteins linked to lower central blood pressure, compared with animal protein.

"It was previously estimated that a modest reduction in systolic blood pressure of 5 mmHg would potentially lead to an overall reduction in mortality from stroke, coronary heart disease, or all-cause mortality," they wrote. *"Intake of the amino acids investigated in the current study was associated with a mean difference in SBP of 24.1 mmHg. The magnitude of these associations is similar to those previously reported for established lifestyle risk factors for hypertension, including sodium intake, physical activity, and alcohol consumption.*

"For PWV, the scale of the association was 0.4 m/s, which is similar to the magnitude of change previously associated with not smoking supplementation with [omega-3 fatty acids] and, to the differences observed between individuals with or without metabolic syndrome, hypertension, or hypercholesterolemia."

Mechanism of action

Commenting on the potential mechanism, Dr Jennings and her co-workers note that some of the amino acids, including glutamic acid, arginine, glycine, cysteine, and histidine can affect levels of the potent vasodilator nitric oxide.

There is also evidence to support a role for leucine in insulin signaling, while cysteine may influence glucose uptake.

"To our knowledge, this is the first cross-sectional study to examine associations between amino acids that have known mechanistic links to cardiovascular disease and a range of in vivo measures of arterial stiffness and central blood pressure associated with cardiovascular disease risk," wrote the researchers.

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"Amino Acid Intake Is Inversely Associated with Arterial Stiffness and Central Blood Pressure in Women"
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