Public release date: 6-Jul-2009

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Component of vegetable protein may be linked to lower blood pressure

Consuming an amino acid commonly found in vegetable protein may be associated with lower blood pressure, researchers report in Circulation: Journal of the American Heart Association.

Researchers found that a 4.72 percent higher dietary intake of the amino acid glutamic acid as a percent of total dietary protein correlated with lower group average systolic blood pressure, lower by 1.5 to 3.0 millimeters of mercury (mm Hg). Group average diastolic blood pressure was lower by 1.0 to 1.6 mm Hg.

Systolic blood pressure is the force when the heart beats; diastolic pressure is the pressure when the heart rests between beats.

This average lower blood pressure seems small from an individual perspective. But, on a population scale, it represents a potentially important reduction, said Jeremiah Stamler, M.D., lead author of the study.

"It is estimated that reducing a population's average systolic blood pressure by 2 mm Hg could cut stroke death rates by 6 percent and reduce mortality from coronary heart disease by 4 percent," said Stamler, professor emeritus of the Department of Preventive Medicine in the Feinberg School of Medicine at Northwestern University in Chicago, Ill.

Based on American Heart Association 2009 statistics, 6 percent of stroke deaths would be more than 8,600 people and four percent of coronary heart deaths represents about 17,800 lives saved per year.

"High blood pressure is a major cardiovascular disease risk factor, and blood pressure tends to rise with age starting early in life so that the majority of the U.S. population age 35 and older is affected by pre-hypertension or hypertension," he said. "We have a massive public health problem, and trying to address it by the strategy that has prevailed for years — diagnosis and

drug treatment — is inadequate. While clinically useful, it fails as a long-term approach for ending this massive problem."

The only long-term approach is to prevent pre-hypertension and hypertension by improved lifestyle behaviors, Stamler said. This includes maintaining a healthy body weight, having a fruit and vegetable-rich eating pattern and participating in regular physical activity. His previous study, INTERSALT, was instrumental in helping show that high-salt diets contribute to high blood pressure.

In the current study, researchers examined dietary amino acids, the building blocks of protein. Glutamic acid is the most common amino acid and accounts for almost a quarter (23 percent) of the protein in vegetable protein and almost one fifth (18 percent) of animal protein, Stamler said.

Researchers analyzed data from the International Study on Macro/Micronutrients and Blood Pressure (INTERMAP), on 4,680 people ages 40 in 17 rural and urban populations in China, Japan, the United Kingdom and the United States. INTERMAP is a basic population study aiming to clarify the role of multiple nutrients in the etiology of unfavorable blood pressure patterns prevailing for most middle-aged and older individuals. Stamler and colleagues analyzed data from eight blood pressure tests, four diet recall surveys and two 24-hour urine collections for each participant.

"Although our research group and others earlier reported an association between higher consumption of vegetable protein and lower blood pressure, as far as we know this is the first paper on the relation of glutamic acid intake to blood pressure," said Ian J. Brown, Ph.D., co-author of the study and a research associate in the Department of Epidemiology and Public Health at Imperial College London.

Common sources of vegetable protein include beans, whole grains — including whole grain rice, pasta, breads and cereals — and soy products such as tofu. Durum wheat, which is used to make pasta, is also a good source of vegetable protein.

Stamler noted that there are no data on the possible effects of glutamic acid supplements and emphasized the importance of "improved habitual food intake for the prevention and control of hypertension, not popping pills."

Stamler said the INTERMAP Study may help explain on a molecular level why the Dieatary Approaches to Stop Hypertension (DASH) diet lowers blood pressure. The DASH eating pattern,

developed by the U.S. National Institutes of Health, is rich in fruits, vegetables and low-fat and nonfat dairy products as well as whole grains, lean poultry, nuts and beans. The pattern is recommended by the American Heart Association and the National Heart, Lung, and Blood Institute, the key sponsor of the INTERMAP study.

"The DASH eating pattern resembles the Mediterranean eating style for the 21st century, including reduced salt intake," Stamler noted. "Multiple modifications supply multiple nutrients helpful for the prevention and control of high blood pressure, including glutamic acid.

Although the current study examined just one element in the dietary mix, amino acids, Stamler said there's no one "magic bullet."

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