Researchers show new antioxidant could help treat cardiovascular disease

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(PhysOrg.com) -- Researchers at the University of Glasgow believe they have found a potential new treatment for cardiovascular disease which reduces blood pressure.

Scientists at the British Heart Foundation Glasgow Cardiovascular Research Centre (BHF GCRC) used a recently-developed antioxidant called MitoQ10 to prevent damage to the mitochondria of cells in an experimental model of hypertension and stroke.

The researchers found that MitoQ10 improved the function of the endothelial cells which line blood vessels and play an important part in controlling blood pressure, as well as reducing thickening of the heart muscle (cardiac hypertrophy) which results from high blood pressure (hypertension).

Lead researcher Professor Anna Dominiczak, Head of the BHF GCRC and BHF Chair of Cardiovascular Medicine, said: “We have shown that this particular type of antioxidant can substantially reduce the damage caused by oxidising molecules.

“Given the apparent role that mitochondrial damage plays in cardiovascular disease, this research opens up new possibilities for novel treatments which will reduce high blood pressure in patients with this condition.”

Mitochondria are sub-units within a cell which provide energy to the

cell, help control cell metabolism and play a part in cell signalling, which if damaged can result in a wide range of diseases, including cardiovascular disease.

Mitochondria are susceptible to damage caused by reactive oxygen species which are highly-reactive molecules containing oxygen atoms which have lost an electron as a natural result of respiration.

The antioxidant used by the researchers - MitoQ10 - is able to penetrate the layers of a cell better than other antioxidant treatments and can be taken orally, and has already been used in phase two trials of patients with hepatitis C and was shown to protect against liver damage. It has also been trialled by patients with Parkinson's Disease.

However, the Glasgow study found that MitoQ10 did not completely prevent the development of high-blood pressure suggesting that mitochondrial oxidative damage is just one of a number of factors contributing to hypertension.

The research was funded by the BHF, Wellcome Trust Cardiovascular Functional Genomics Initiative and the European Union Sixth Framework Programme Integrated Project and is published in the journal Hypertension this week.

The project was conducted in collaboration with Dr Mike Murphy of the Medical Research Council Mitochondrial Biology Unit, Cambridge and Prof Rob Smith, University of Otago, New Zealand, who designed the MitoQ compound.

Provided by University of Glasgow