

Heart prevention in people with diabetes using vitamin B1

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Following a heart attack, new vessels formed around the infarct to help reestablish the blood flow to the damaged heart: cardiac cells stained green; vessel stained red; demarcation of infarct by dotted line

Diabetes leaves the heart more vulnerable to stress as less oxygen and nutrients are delivered to the heart and other organs. Heart damage can be caused by high levels of glucose entering cardiovascular cells, which forms toxins that accelerate the ageing of the cell.

Around 50 per cent of people with diabetes die from <u>cardiovascular</u> <u>disease</u>, and this complication is the leading cause of death among people with diabetes. Researchers warn that with increasing prevalence of diabetes (around one in twenty people in the UK are now diagnosed with the condition), diabetes will result in a new epidemic of <u>heart</u>



failure unless new treatments are developed.



Formation of new vessels is diminished in diabetes...



...but restored by dietary supplementation with vitamin B1, thus allowing a better recovery from the infarct

A team of researchers at the University of Bristol gave a synthetic derivative of vitamin B1 called benfotiamine to mice with and without diabetes. They found that treating mice with Type 1 or Type 2 diabetes with benfotiamine from the early stages of diabetes can delay



progression to heart failure. They also found that the vitamin B1 derivative improved survival and healing after heart attacks in Type 1 mice (and even in the mice without diabetes too). Foods rich in vitamin B1 include Marmite, yeast and quorn, but it is not yet known whether changes to diet alone would provide enough of the vitamin to see the same effects as supplements achieved in mice.

Previous Diabetes UK-funded research at the University of Warwick was the first to show that people with Type 1 and Type 2 diabetes have around 75 per cent lower levels of vitamin B1 than people without diabetes. It is thought that this may not be due to diet, but due to the rate at which the vitamin is cleared from the body. Small scale clinical trials of people with Type 2 diabetes have also discovered a link between taking vitamin B1 supplements and a reduction in the signs of kidney disease.

The latest research has been published in the *Journal of Molecular and Cellular Cardiology*. Professor Paolo Madeddu who led this research at the University of Bristol said "Supplementation with benfotiamine from early stages of diabetes improved the survival and healing of the hearts of diabetic mice that have had heart attacks, and helped prevent cardiovascular disease in mice with both Type 1 and Type 2 diabetes. We conclude that benfotiamine could be a novel treatment for people with diabetes, and the next step in this research will be testing whether similar effects are seen in humans."

Dr. Victoria King, Head of Research at Diabetes UK said "Diabetes UK is pleased to have supported this research and is encouraged by these promising results which now need to be tested and confirmed in human trials. We would like to note that it's still too early to draw any firm conclusions about the role of vitamin B1 in the prevention of complications and we would not advise that people look to vitamin supplements to reduce their risk of cardiovascular complications at this



stage. Taking your prescribed medication, eating a healthy balanced diet and taking regular physical activity are key to good diabetes management and therefore reducing your risk of diabetes associated complications."

More information: Benfotiamine improves functional recovery of the infarcted heart via activation of pro-survival G6PD/Akt signaling pathway and modulation of neurohormonal response by Rajesh Katare, et al. in the Journal of Molecular and Cellular Cardiology.

Provided by University of Bristol

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