An inexpensive first-line treatment for type 2 diabetes may also reduce heart disease in those with type 1 diabetes

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Credit: University of Glasgow

An inexpensive first-line treatment for type 2 diabetes may also reduce heart disease in those with type 1 diabetes, according to a new global trial led by the University of Glasgow.

The REMOVAL trial's results, announced today at the American Diabetes Association's 77th Scientific Sessions conference in San Diego,

and published in the journal *The Lancet Diabetes and Endocrinology*, shows how the drug metformin has potentially beneficial effects on cardiovascular and metabolic outcomes in adults with longstanding type 1 diabetes.

Currently metformin is recommended for use in those with type 1 diabetes to reduce insulin requirement and stabilise weight, but its effects on the heart and blood vessels in this condition have been unknown. Heart disease is the most common cause of reduced life expectancy in people with type 1 diabetes. In Scotland only 15% of adults with type 1 diabetes have ever received metformin, and only 8% are taking it at any one time.

The REMOVAL trial is the largest clinical trial of metformin therapy in type 1 diabetes to date and has provided clinically meaningful data on metformin's potential to reduce the risk of developing cardiovascular disease.

Study lead Prof John Petrie, from the University of Glasgow's Institute of Cardiovascular and Medical Sciences, said: "The results from this trial are significant because currently cardiovascular disease is a major cause of reduced life expectancy in type 1 diabetes, and cardiovascular disease rates are more than double those of the background population.

"Type 1 diabetes is not caused by lifestyle issues. Insulin therapy is required to control glucose and reduce complications but can cause weight gain which in turn is associated with high cholesterol. This may be one of the reasons that cardiovascular complications remain such a problem for people with type 1 diabetes."

He added: "Our results showed a reduction in the progression of atherosclerosis (thickening of the arteries) in adults with type 1 diabetes, meaning there is now a stronger case to use metformin more widely as a

long-term strategy to reduce heart disease risk in those with type 1 diabetes, mirroring its use in type 2 diabetes."

The primary objective of the trial was to test whether up to three years treatment with metformin 1000 mg twice daily (added to standard insulin therapy) reduced the risk of heart disease in adults over 40 with longstanding type 1 diabetes and an increased risk for cardiovascular disease.

The trial looked at 428 men and women the UK, USA, Australia, Canada, Denmark and the Netherlands with type 1 diabetes for five years or more. Of 428 randomised, 219 were allocated metformin and 209 placebos.

The conclusions were drawn over three years, using annual ultrasound scans to measure thickening in the large blood vessels (carotid arteries) as a marker of heart disease; and looking at important positive secondary outcomes related to weight, insulin dose and cholesterol levels.

Karen Addington, UK Chief Executive of the type 1 diabetes charity JDRF, which funded the study, said: "People with type 1 diabetes are living longer, healthier lives than ever before. However complications such as heart disease are, naturally, a concern for many families affected by the condition.

"We are committed to eradicating type 1 diabetes and its complications. Findings such as these are crucial in developing ways of using an accessible drug such as Metformin to ensure people living with type 1 stay healthy for longer."

The paper, Cardiovascular and metabolic effects of metformin in type 1 diabetes (REMOVAL): a double-masked, randomised placebo-controlled trial' is published in The Lancet Diabetes and Endocrinology.

The research was funded by JDRF (a charity devoted to funding research to cure, treat and prevent type 1 diabetes).

More information: John R Petrie et al. Cardiovascular and metabolic effects of metformin in patients with type 1 diabetes (REMOVAL): a double-blind, randomised, placebo-controlled trial, *The Lancet Diabetes & Endocrinology* (2017). DOI: 10.1016/S2213-8587(17)30194-8