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Estimating the potential incremental benefits on Type 2 diabetes complications rates of targeting successively lower LDL-cholesterol levels

SA Mostafa¹, RL Coleman¹, OF Agbaje¹, A Gray², RR Holman¹ and MA Bethel¹

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¹Diabetes Trials Unit, University of Oxford, Oxford, UK, ²Health Economics Research Centre, University of Oxford, Oxford, UK

Aims: Few data are available to inform individuals with Type 2 diabetes the degree to which targeting lower LDL-cholesterol levels might reduce their risk of complications. To establish a scale of benefits, we modelled Type 2 diabetes outcomes over a range of simulated LDL-cholesterol levels.

Methods: We used the UKPDS Outcomes Model version 2.0 to estimate 10-year outcomes for a contemporaneous Type 2 diabetes population by utilising baseline data from 5,717 participants enrolled in the Trial Evaluating Cardiovascular Outcomes with Sitagliptin study. Individual risk factor levels were held constant over 10 years for 5 simulations which held LDL-cholesterol levels constant at 5.0, 4.0, 3.0, 2.0 and 1.0mmol/l, respectively. Relative Risk Reductions (RRRs) for myocardial infarction (MI), stroke, heart failure and all-cause mortality *per* 1.0mmol/l LDL decrement, referenced to 5.0mmol/l, were compared using Kruskal-Wallis tests.

Results: Patients were mean age 66 years, HbA1c 7.3%, systolic blood pressure 134mm Hg, HDL-cholesterol 1.12mmol/l, and median Type 2 diabetes duration 9.8 years with 66.6% White ethnicity, 28.3% women and 52.7% with prior history smoking.

RRRs for each 1mmol/l decrement from 5.0mmol/l for MI were 16.9%, 30.8%, 41.2% & 51.0%; for stroke 9.2%, 19.7%, 29.6% & 38.8%; for heart failure 7.6%, 15.5%, 23.7% & 31.5%; and for all-cause mortality 5.4%, 10.2%, 13.8% & 17.3% ($p < 0.001$ in all cases).

Conclusions: These simulated outcomes illustrate the potential benefits of targeting progressively lower LDL-cholesterol values from a baseline of 5.0mmol/l in Type 2 diabetes and could provide guidance for clinicians and patients in developing personalised health management strategies.