Cost-effectiveness of statin therapy in categories of patients in the UK

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Background: Cardiovascular disease (CVD) mortality has declined steadily over the last few decades across Europe and North America.

Purpose: To provide contemporary estimates of long-term effectiveness and cost-effectiveness of statin therapy in different categories of patients in UK.

Methods: The CTT-UKB micro-simulation model, developed using the Cholesterol Treatment Trialists‘ Collaboration data (CTT: 118,000 participants; 5 years follow-up), and calibrated in the UK Biobank cohort (UKB: 502,000 participants; 9 years follow-up). The model integrates parametric risk equations for incident myocardial infarction, stroke, coronary revascularization, diabetes, cancer and vascular and nonvascular death, and projects annually these endpoints and survival using patient characteristics at entry. UKB data and linked primary and hospital care data informed healthcare costs in the model (2020 UK£); 2021 UK NHS Drug Tariff informed statin costs (atorvastatin 40mg at £1.22 and 80mg at £1.68 per 28 tablets); and Health Survey for England data informed health-related quality of life in the model. Previous CTT meta-analysis, atorvastatin dose-response randomized trials, and further meta-analyses of statin trials and cohort studies informed effects of 40mg/80mg atorvastatin therapy daily on rates of incident myocardial infarction, stroke, coronary revascularization, vascular death, diabetes, myopathy and rhabdomyolysis.

The model was used to project gains in quality-adjusted life years (QALYs) and additional cost per QALY with lifetime use of atorvastatin 40mg or 80mg daily in categories of UKB participants by sex, age at statin initiation (40–49; 50–59 and 60–70 years), and 10-year CVD risk (QRISK3 risk (%): <5; 5–10; 10–15; 15–20; ≥20). Further scenarios explored effects of 5-year delay of statin initiation in people under 45 years of age or stopping statin therapy at 80 years of age.

Results: Across men and women in categories by age and CVD risk, lifetime use of atorvastatin 40mg daily was associated with increases in survival by 0.44–1.69 years (0.28–1.02 QALYs), and atorvastatin 80mg daily with increases in survival of 0.45–1.87 years (0.32–1.13 QALYs; Figure 1) with gains larger among participants at higher CVD risk. Both atorvastatin 40mg and 80mg doses were in the range of cost-effective treatments with incremental cost per QALY gained with atorvastatin 40mg daily versus no statin therapy below £7200/QALY and with atorvastatin 80mg vs 40mg daily below £16000/QALY (Figure 2) across all patient categories studied. Compared to lifetime statin therapy, stopping therapy at 80 years of age substantially reduced benefits and was not cost-effective in any patient category studied. Similarly, compared to immediate initiation, 5-year delay of statin therapy in 40–45 years old patients was not a cost-effective.

Conclusions: In the UK, statin therapy remains highly cost-effective across men and women 40–70 years old, including those at 10-year CVD risk <5%.