Cost utility analysis of intensive blood-glucose control, tight blood pressure control and metformin in patients with Type 2 diabetes

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Background and aims: While the United Kingdom Prospective Diabetes Study (UKPDS) has demonstrated that intensive blood glucose control and tight blood pressure control are cost-effective, the comparisons to date have been restricted to measuring outcomes in life years or end-point free time. Maximum comparability and usefulness for decision makers is obtained when outcomes can be expressed in common units, and the measure that has gained most currency amongst economists has been the quality adjusted life year (QALY). Therefore the aim of this study is to extend previous analyses by evaluating these UKPDS policies using QALYs as the outcome measure.
Materials and methods: Cost utility analysis based on patient level data from a randomized clinical controlled trial involving 4209 patients with newly diagnosed type 2 diabetes conducted in 23 hospital based clinics in England, Scotland and Northern Ireland as part of the UKPDS. Within trial data was supplemented with lifetime extrapolation using the UKPDS Outcomes Model, which is based on an integrated system of parametric equations using updated covariates. These equations were used to predict a natural history of the disease for each patients remaining lifetime. Three different policies were evaluated: intensive blood glucose control with sulphonylurea/insulin; tight blood pressure control of hypertensive patients; and intensive blood glucose control with metformin for overweight patients. Incremental cost-effectiveness ratios were calculated based on the net cost of health care resources associated with these policies and the estimated effectiveness in terms of the incremental QALYs gained from within trial effects. Costs and effects were discounted at the UK Treasury recommended rate of 3.5%.
Results: The incremental cost-effectiveness ratio (in year 2000 United Kingdom prices) for intensive blood-glucose control was £6,294 per QALY, and for blood pressure control was £703 per QALY. Metformin therapy reduced overall costs by £851 and increased quality adjusted life expectancy by 0.55 years.
Conclusion: Each of the three policies evaluated has a cost per QALY gained lower than that of many other accepted uses of health care resources, and therefore represent good value for money. The results provide an economic rationale for ensuring that care of patients with type 2 diabetes corresponds at least to the levels of these interventions.