Objective

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by insulin resistance as a result of insufficient insulin production or resistance to insulin. It is estimated that over 2.2 million new cases of T2DM were diagnosed within the UK in 2010. The incidence of T2DM is forecast to increase to 14.3 million by 2050 with an estimated 17.6 million new cases expected worldwide in 2030 [1]. It is of importance to consider the cost-effectiveness of T2DM treatment as it accounts for 7–12% of the total UK National Health Service (NHS) expenditure [2]. Thus, the choice of a cost-effective treatment is important.

For the NICE guidelines, the peer-reviewed and published CARDIFF diabetes modelling framework is recommended when monotherapy is not tolerated or does not provide sufficient glycaemic control [3]. The efficiency of insulin is used in insulin monotherapy and treatment switch, as insulin is the only drug category used to intervene for insulin resistance or other personal issues, or obesity [4].

Dapagliflozin (DAPA) is the first in a new class of insulin-sensitising glucose lowering medications, selectively inhibiting the sodium-glucose cotransporter (SGLT2) [5], an enzyme involved in the reabsorption of glucose from the glomerular filtrate, which when added to MET in inadequately controlled MET, has been demonstrated that DAPA + MET results in an incremental cost-effectiveness ratio (ICER) of £225/ QALY gained [6].

Previously, results of a cost-effectiveness analysis, based on the 52-week RCT have been presented [7]. Results by Lane et al. 2012 are based on a Canadian population, rather than UK population. However, weight change in the model can still be compared with the data by Del Prato et al. 2013 at week-104 (year 2), before the first treatment switch. Both the model and the clinical trial present inter-relationship between improved glycaemic control, hypoglycaemia and weight loss, of MET + DAPA, supported by the evidence found in Del Prato et al. 2013.

Results

Base case

Through the simulation the MET + DAPA algorithm showed greater sustained weight loss (Figure 1 and 2), compared with the MET + SU algorithm. By year 4, weight change for MET + DAPA, and MET + SU 3.62 and 1.44 kg respectively, resulting in a difference in weight of 2.18 kg at year 4. This treatment switch, from the first line treatment to the second line treatment, took place at week-52 of the model analysis.

However, weight change in the model can still be compared with the data by Del Prato et al. 2012 at week-52/week 1 year. The clinical trial showed a weight change from baseline of -3.52 kg and +1.44 kg respectively, resulting in a difference of weight change of 4.96 kg. This weight change is comparable to what is observed from the clinical trial data.

Discussion & Conclusions

The additional health gain from the model is the maintained decrease in weight, caused by the MET + DAPA treatment algorithm, described in the Methods section of this paper. However, no regression analyses were performed to account for the aforementioned decrease in weight, where the additional health gain observed mainly stems from the maintained decrease in weight.

The additional health gained observed mainly stems from the maintained decrease in weight, caused by the MET + DAPA treatment algorithm, described in the Methods section of this paper. However, no regression analyses were performed to account for the aforementioned decrease in weight, where the additional health gain observed mainly stems from the maintained decrease in weight.