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table 1: Summary of observed endpoints predicted by equation 2.3 for NIDDM treated with CHF, stroke, amputation or renal failure, and the long-term elevation of risk of death following the occurrence of one or more of these complications. Non-diabetes related mortality was risk was based on BMI (kg/m2) after adjusting for baseline age, ses. There is a need for improved risk equations for use in diabetes models that adequately capture the deleterious effects of increasing body weight, particularly. This study demonstrates that despite using a diabetes model that has been shown to have good predictive validity to cardiovascular and mortality events reported across a large number of major T2DM outcomes the model significantly underestimated the relationship between increasing BMI and CHD and total mortality risk. This study used the IMS Core Diabetes Model (CDM) [3,4], a lifetime economic consequences of interventional T2DM or T2DM, to evaluate the degree to which the association between all cause mortality and BMI as measured by the CDM and risk equations included within the model. Using published observational data from the Swedish National Diabetes Register (SNDR) [5] we compared the predicted incidence of fatal/non-fatal CHD (total/non-fatal myocardial infarctions, ischaemic heart disease) and total mortality over a mean follow-up period of 5.6 years. The CDM was run using patient level data (PLD) from NHANES [6] to analyse the relationship between individual input profiles and predicted output.

• There is a substantial body of epidemiological evidence relating body mass index (BMI) to increased risk of cardiovascular disease and all-cause mortality (ACM) in subjects with type-2 diabetes mellitus (T2DM) [1,2].

• Cardiovascular (CV) and mortality risk equations typically incorporate the effects of increased BMI via either a linear-relationship between modifiable CV risk factors (such as cholesterol and systolic blood pressure) and BMI, or, by assuming there exists a threshold true mortality risk. Accurate prediction of the long-term health consequences associated with the management of T2DM is crucial if the value of new health technologies that promote weight loss are to be fully captured.

• Therefore, the objective of this study was to assess by how much existing risk equations underestimate the risk of mortality as a function of increasing levels of BMI.

Methods

Diabetes R

• A recent study assessing the CDM’s general predic

Objectives

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Results

• Results from the general model validation are presented in Figure 1; with scatterplots of observed versus predicted endpoints across all validation studies stratified by year of study, trial, endpoint and diabetes type. Overall validation coefficient of determination, (R² = 0.89).

• Figure 3 shows the impact on predicted diabetes related endpoints obtained from the CDM in those with BMI <25 kg/m2 compared to those with BMI >30 kg/m2.

• Comparing subjects with BMI<25 kg/m2 (mean age 60.4 years, 53.9% male; 20.7% current smokers; duration of diabetes 9.8 years; HbA1c=7.56%; SBP 141.4mmHg and BMI 23.0 kg/m2) to those with BMI >30 kg/m2 (mean age 59.7 years, 49.0% male; 14.7% current smokers; duration of diabetes 7.7 years; HbA1c=7.7.4%; SBP 148.0mmHg and BMI 34.1 kg/m2) produced hazard ratios of 1.12 (1.09 – 1.14) and 1.47 (1.16-1.85) for CHD and total mortality respectively.

• Hazard ratios derived from the CDM were 1.02 (0.91-1.07) and 0.96 (0.95-0.97) for CHD and total mortality respectively; see Figure 3.

• The C34H Diabetes Model is owned and maintained by IMS Health.

Conclusion

• This study demonstrates that despite using a diabetes model that has been shown to have good predictive validity to cardiovascular and mortality events reported across a large number of major T2DM outcomes the model significantly underestimated the relationship between increasing BMI and CHD and total mortality risk. This study used the IMS Core Diabetes Model (CDM) [3,4], a lifetime economic consequences of interventional T2DM or T2DM, to evaluate the degree to which the association between all cause mortality and BMI as measured by the CDM and risk equations included within the model.

• Using published observational data from the Swedish National Diabetes Register (SNDR) [5] we compared the predicted incidence of fatal/non-fatal CHD (total/non-fatal myocardial infarctions, ischaemic heart disease) and total mortality over a mean follow-up period of 5.6 years. The CDM was run using patient level data (PLD) from NHANES [6] to analyse the relationship between individual input profiles and predicted output.

• Hazard ratios (HR) from the model were compared with study HRs validated to UKPDS 33 [7]; A deprivation and polypharmacy. Results from the CDM in those with BMI <25 kg/m2 compared to those with BMI >30 kg/m2.

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References


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