Clinical *DIGEST 1*

Diabetes journals

OGTT detects silent diabetes in CAD

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Studies have reported a high prevalence of undiagnosed ("silent") diabetes in people with coronary artery disease (CAD).

2 This study compared the new recommendation for diabetes diagnosis, an HbA_{1c} cut-off of ≥6.5% (≥48 mmol/mol), with results using the oral glucose tolerance test (OGTT) to determine silent diabetes in people with known or suspected CAD undergoing coronary angiography.

3 In total, 1015 people with known or suspected CAD were admitted for acute (n=149) or elective (n=866) coronary angiography; those with known diabetes were excluded from the study.

4 All participants underwent an OGTT the day after their coronary angiography; results were classified as having normal glucose tolerance (NGT), impaired fasting glucose (IFG), impaired glucose tolerance (IGT) or diabetes.

5 HbA_{1c} measurements classified participants into three glycaemic groups: normal (HbA_{1c} <5.7%; <39 mmol/mol); borderline (HbA_{1c} 5.7–6.4%; 39–47 mmol/mol); and diabetes (HbA_{1c} ≥6.5%; ≥4.8 mmol/mol).

6 The OGTT results classified 513 participants (51%) with NGT, 10 (1%) with IFG, 349 (34%) with IGT and diagnosed 149 (14%) with diabetes.

7 HbA_{1c} measurements classified 588 participants (58%) as normal, 385 (38%) as borderline and diagnosed 42 (4%) with diabetes.

8 The authors concluded that an OGTT should be routinely performed to detect silent diabetes in people with CAD undergoing coronary angiography; HbA_{1c} alone misses cases.

Doerr R, Hoffman U, Otter W et al (2011) Oral glucose tolerance test and HbA_{1c} for diagnosis of diabetes in patients undergoing coronary angiography: the Silent Diabetes Study. *Diabetologia* **54**: 2923–30

Undiagnosed diabetes best detected by OGTT in people with coronary artery disease undergoing angiography

Marc Evans,
Consultant Physician,
Llandough Hospital,
Cardiff

There has been considerable debate relating to the potential use of the HbA_{1c} measurement for early detection of type 2 diabetes in people who may be at risk of developing the condition.

The primary aim of the study summarised alongside (Doerr et al, 2011) was to investigate whether the new recommendation for diabetes diagnosis using the HbA_{1c} cut-off of ≥6.5% (≥48 mmol/mol) was suitable for detecting the presence of silent diabetes in patients with known or suspected coronary artery disease (CAD) undergoing coronary angiography; results were compared with those from the oral glucose tolerance test (OGTT). A secondary aim was to investigate whether the prevalence of abnormal glucose regulation correlates with the severity of CAD.

Data from 1015 people admitted for coronary angiography were analysed. Those with known diabetes were excluded. Using the OGTT results, participants were classified as having normal glucose tolerance (NGT), impaired fasting glucose (IFG), impaired glucose tolerance (IGT) or diabetes.

Based on the OGTT, 513 people (51%) were found to have NGT, 10 (1%) IFG, 349 (34%) IGT, and 149 (14%) were diagnosed with diabetes. According to HbA_{1c} measurements, 588 people (58%) were classified as having normoglycaemia, 385 (38%) as being borderline, and 42 (4%) were diagnosed with diabetes.

The results of this study demonstrate that the OGTT identifies considerably more people with abnormal glucose regulation undergoing coronary angiography than the HbA_{1c} measurement using a cut-off point of ≥6.5% (≥48 mmol/mol). This study also showed a significant correlation between the prevalence of abnormal glucose regulation as detected by the OGTT and the extent of CAD; no such relationship was found with HbA_{1c}.

The results of this study illustrate that in certain high-risk groups, such as those with documented CAD, HbA_{1c} testing alone may miss a substantial proportion of people with undiagnosed diabetes; an OGTT should therefore be performed in people without previously diagnosed diabetes who are undergoing coronary angiography.

Strict HbA_{1c} improves mortality risk in T2D

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 The relationship between all-cause mortality risk and two levels of strict glycaemic control – an HbA_{1c} level 6.0% (42 mmol/mol) and 6.5% (48 mmol/mol) – was assessed in adults with T2D; differences in mortality risk were compared according to age, insulin treatment and cardiovascular (CV) risk.

2 Data were obtained from adults with T2D participating in the third National Health and Nutrition Examination Survey (1988–1994) and its linked mortality file (up to 2000).

3 Strict glycaemic control with both an HbA_{1c} of ≤6.0% (≤42 mmol/mol) and ≤6.5% (≤48 mmol/mol) was associated with a lower mortality risk (hazard ratio [HR], 0.69 [95% confidence interval (CI), 0.48–0.98] and HR, 0.72 [95% CI, 0.57–0.92], respectively).

4 There were statistically significant interactions for strict glycaemic control with age and insulin therapy.

5 Strict glycaemic control may decrease mortality risk in people with T2D as long as they are not at high risk for CV disease or in poor health.

6 It was concluded that further research is needed to see how strict glycaemic control affects people with diabetes with differing health status.

Davila EP, Florez H, Trepka MJ et al (2011) Strict glycemic control and mortality risk among US adults with type 2 diabetes. *J Diabetes Complications* **25**: 289–91

> *"Results suggest that further improving HbA$_{1c}$, systolic blood pressure and total cholesterol: HDL-cholesterol will reduce the risk of coronary heart disease in people with diabetes."*

DIABETOLOGIA

Long-term survival after first MI is reduced by diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Although long-term survival after a first myocardial infarction (MI) keeps improving, survival is significantly reduced in people with diabetes.

2 The authors sought to determine whether the difference in long-term mortality rate in people with and without diabetes after a first MI has reduced.

3 Complete data for 6776 people from the Northern Sweden MONICA Myocardial Infarction Registry who had suffered a first MI during 1989–2006 were analysed.

4 During a median follow-up of 6.8 years (50 667 patient-years), the prevalence of diabetes increased from 12–18% in men and from 16–21% in women.

5 A total of 34.7% of participants without diabetes and 50.6% of those with diabetes died during the study.

6 Median survival for men with and without diabetes was 123 months and 227 months, respectively; for women with and without diabetes, median survival was 81 months and 222 months, respectively.

7 In a Cox-regression analysis, participants with diabetes had an age-adjusted hazard ratio for all-cause mortality of 1.65 (95% confidence interval, 1.50–1.82) compared with those without diabetes.

8 Survival rates increased over three consecutive cohorts, although the mortality rate was higher for those with diabetes within each cohort.

9 The authors concluded that although survival has improved for people with diabetes, the effect of diabetes on long-term mortality after a MI has not diminished.

Eliasson M, Jansson J-H, Lundblad D, Näslund U (2011) The disparity between long-term survival in patients with and without diabetes following a first myocardial infarction did not change between 1989 and 2006. *Diabetologia* **54**: 2538–43

DIABETES CARE

Improved risk factors have reduced CHD

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Data from 1977 adults with diabetes who participated in the National Health and Nutrition Examination Survey were used to estimate the 10-year risk for developing coronary heart disease (CHD).

2 Risk prediction algorithms were taken from the UKPDS (UK Prospective Diabetes Study), the Atherosclerosis Risk in Communities study and the Framingham Heart Study.

3 There were significant improvements in the major risk factors for CHD: HbA$_{1c}$, systolic blood pressure, and the ratio of total cholesterol to HDL-cholesterol (TC : HDL).

4 The estimated UKPDS 10-year risk for developing CHD decreased significantly, from 21.1% in 1999–2000 to 16.4% in 2007–2008 (P<0.001).

5 Results suggest that further improving HbA$_{1c}$ level, systolic blood pressure and TC : HDL will reduce the risk of CHD in people with diabetes.

Ford ES (2011) Trends in the risk for coronary heart disease among adults with diagnosed diabetes in the US. *Diabetes Care* **34**: 1337–43

DIABETOLOGIA

TC : HDL and HbA$_{1c}$ determine CVD risk

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓✓

1 The relative importance of HbA$_{1c}$ control and the ratio of total cholesterol to HDL-cholesterol (TL:HDL) on cardiovascular disease (CVD) risk was examined in people with T2D.

2 Some 22 135 people with T2D were followed up for 5 years; measures included HbA$_{1c}$ and TC : HDL, and outcomes were coronary heart disease (CHD), stroke, CVD and total mortality.

3 Hazard ratios per 1 standard deviation increase in updated mean HbA$_{1c}$ and TC : HDL values were 1.13 (95% confidence interval [CI], 1.07–1.19) and 1.31 (1.25–1.37) for fatal/non-fatal CHD, 1.15 (1.06–1.24) and 1.25 (1.17–1.34) for stroke, 1.13 (1.08–1.18) and 1.29 (1.24–1.34) for CVD (all P<0.001), and 1.07 (1.02–1.13; P=0.01) and 1.18 (1.12–1.24; P<0.001) for total mortality, respectively.

4 The P-values for the interaction between HbA$_{1c}$ and TC:HDL was 0.02 for CHD, 0.6 for stroke and 0.1 for CVD.

5 Results showed risk increases for CVD and total mortality with increasing TC : HDL and HbA$_{1c}$.

Gudbjörnsdottir S, Eliasson B, Eeg-Olofsson K et al (2011) Additive effects of glycaemia and dyslipidaemia on risk of cardiovascular disease in type 2 diabetes. *Diabetologia* **54**: 2544–551

DIABETES CARE

Non-HDL:HDL best predicts CHD risk

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 An observational study design was used to determine the clinical effectiveness of the lipid measures LDL-cholesterol, non-HDL-cholesterol, the ratio of non-HDL to HDL-cholesterol (non-HDL : HDL) and the ratio of triacylglycerol to HDL-cholesterol (TG : HDL) for predicting coronary heart disease (CHD) in people with T2D.

2 The study comprised 18 673 participants with T2D who were followed up for a mean of 4.8 years.

3 Hazard ratios for CHD per 1 standard deviation increase in lipid measures were 1.23 for non-HDL : HDL, 1.20 for non-HDL-cholesterol, 1.17 for LDL-cholesterol and 1.15 for TG : HDL (all P<0.001); low TG : HDL values were more often within the lowest non-HDL : HDL tertile than within that for LDL-cholesterol.

4 Non-HDL : HDL was concluded to be more effective than LDL-cholesterol, the current measure, for predicting CHD risk in people with T2D .

Eliasson B, Cederholm J, Eeg-Olofsson K et al (2011) Clinical usefulness of different lipid measures for prediction of coronary heart disease in type 2 diabetes. *Diabetes Care* **34**: 2095–2100