Diabetes journals

Will screening for diabetes reduce cardiovascular disease?

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Over the next few months there will be many initiatives around the country on screening for diabetes as part of the cardiovascular primary prevention strategy. I have always been a little sceptical about diabetes screening as it was never clear to me what we would be achieving by detecting people with diabetes earlier than currently via symptoms or routine clinical practice.

The Cambridge ADDITION (Anglo-Danish-Dutch Study of Intensive Treatment in People with Screen-Detected Diabetes in Primary Care) study reports on the level of screen-detected diabetes, through a questionnaire and subsequent glucose/glucose tolerance tests according to the protocol, and the potential to reduce cardiovascular disease (CVD) risk in these people.

A total of 867 individuals were detected as having diabetes. Of these, 19% had pre-existing CVD, 97% had obesity, 86% had hypertension and 75% had dyslipidaemia. Despite this, only 24% were on lipid-lowering drugs with 56% being on anti-hypertensive medication (mainly beta-blockers).

A simple mathematical model based on UKPDS (UK Prospective Diabetes Study) and Framingham risk engines suggested multi-factorial intervention based on glucose-lowering, lipid-lowering, blood pressure lowering and aspirin treatment had the potential to reduce CVD risk over 10 years by 63%. Considering that the estimated lag-time to diagnosis of diabetes is 5 years, this figure can be reduced by half as screening only gave an extra 5 years of treatment. Nevertheless, only five people need to be treated with multi-factorial intervention, for 10 years, to save one major CVD event.

We can conclude that people detected by screening as having diabetes have a high baseline CVD risk (median risk 34% in men and 21.5% in women using the UKPDS risk engine). This is readily treatable using cheap and effective drugs. The real question now is: which screening method shall we use?

DIABETIC MEDICINE

Effect of insulin on ECG during MI

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

1 QT interval is an electrocardiographic (ECG) marker of myocardial electrical stability; prolongation of QTc (QT interval corrected for heart) in acute myocardial infarction (AMI) is associated with left ventricular dysfunction, increased risk of arrhythmias and sudden death.

2 This multicentre, randomised trial aimed to evaluate the effect of insulin infusion and blood glucose levels during AMI on ECG features of myocardial activity.

3 Patients presenting with AMI who had known diabetes or blood glucose levels of ≥7.8 mmol/L were included in the study.

4 ECGs were examined on admission and at 24 hours. Patients were randomised to two groups: intensive treatment (IT) with insulin infusion versus conventional glucose-lowering treatment (CT) for AMI patients with diabetes or hyperglycaemia.

5 ECG data for 229 patients (122 IT, 107 CT) were analysed. The CT group had prolongation of QTc after 24 hours but the IT group did not.

6 New ECG abnormalities were significantly more common in patients with mean blood glucose levels >8.0 mmol/L in the first 24 hours than in those with mean blood glucose ≤8.0 mmol/L (15.0% vs. 6.0%; $P<0.05$); insulin may yield a protective effect on metabolic and electrical activity in threatened myocardial tissue.

Gan RM, Wong V, Cheung NW et al (2009) Effect of insulin infusion on electrocardiographic findings following acute myocardial infarction: importance of glycaemic control. *Diabet Med* **26**: 174–6

DIABETIC MEDICINE

Reducing CVD risk in screen-detected diabetes

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

1 This study aimed to evaluate the cardiovascular disease (CVD) risk of people with screen-detected type 2 diabetes, and to estimate the risk reduction achievable through early intervention.

2 The Cambridge ADDITION (Anglo-Danish-Dutch Study of Intensive Treatment in People with Screen-Detected Diabetes in Primary Care) identified people with diabetes aged 40–69 years using a stepwise screening procedure (n=867).

3 In people with no previous macrovascular disease, 10-year CVD risk was computed using UKPDS (UK Prospective Diabetes Study) and Framingham engines. Achievable risk reductions were predicted using relative risk reductions from published data.

4 Undiagnosed diabetes was found in 867 people: 86% had hypertension, 75% had dyslipidaemia. Of those with hypertension, 35% were not prescribed medication and 22% were poorly controlled; of those with dyslipidaemia, 68% were not prescribed medication and 22% were poorly controlled.

5 Using the UKPDS engine, median 10-year CVD risk was 34.0% in men and 21.5% in women; using the Framingham engine, results were 38.6% in men and 24.6% in women.

6 Absolute risk reduction achievable through pharmacological intervention ranged from 4.9–9.5% (UKPDS) and 5.4–10.5% (Framingham).

7 People with screen-detected diabetes exhibit an adverse CVD risk profile, some of which may be improved with prompt pharmacological intervention.

Echouffo-Tcheugui JB, Sargeant LA et al (2008) How much might cardiovascular disease risk be reduced by intensive therapy in people with screen-detected diabetes? *Diabet Med* **25**: 1433–9

DIABETES CARE

Reduced CHD risk with community programme

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

1 Overweight individuals with abnormal glucose metabolism have an increased cardiometabolic risk, which can be improved by intensive lifestyle interventions.

2 This article evaluated the hypothesis that the DEPLOY (Diabetes Education and Prevention with a Lifestyle Intervention Offered at the YMCA) pilot study reduces the 10-year coronary heart disease (CHD) risk in people with pre-diabetes.

3 DEPLOY comprised 92 individuals out of the 131 who met the screening criteria at two Greater Indianapolis YMCA facilities.

4 Ten-year CHD risk was predicted using the UKPDS risk engine for group-lifestyle and brief counselling (control) groups. Changes in between-group risk after 4 and 12 months were compared using analysis of covariance.

5 Baseline data on 10-year risk for the intervention and control groups were similar: 11.9% (95% confidence interval 9.3–14.6) and 11.1% (8.2–14.0), respectively (P=0.667).

6 At 4 and 12 months, the intervention group experienced significant decreases in 10-year risk from baseline (–3.28%, P<0.001; –2.23%, P=0.037, respectively) compared with the control group (–0.78%, P=0.339; +1.88%, P=0.073). Between-group differences were significant and increased between the 4- and 12-month visits.

7 This community-based lifestyle intervention significantly reduced estimated 10-year CHD risk for people with pre-diabetes.

Lipscomb ER, Finch EA, Brizendine E et al (2009) Reduced 10-year risk of coronary heart disease in patients who participated in a community-based diabetes prevention program: the DEPLOY pilot study. *Diabetes Care* **32**: 394–6

DIABETOLOGIA

"Dead in bed" syndrome revisited

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

1 Sudden nocturnal death in type 1 diabetes ("dead in bed" syndrome) is thought to be due to electrocardiogram (ECG) QT prolongation with subsequent ventricular tachyarrythmia in response to nocturnal hypoglycaemia (NH).

2 Using continuous ECG and glucose monitoring in a group of people with type 1 diabetes, this study set out to investigate this theory.

3 Twenty-five people with type 1 diabetes aged 20–50 years were recruited and underwent two separate 24-hour ECG and continuous glucose monitoring sessions.

4 Thirteen NH episodes were recorded. Corrected QTc interval was longer during NH compared with normoglycaemic periods (P=0.037). ECG disturbances were seen in eight of the 13 NH episodes.

5 This study confirms that QTc prolongation and ECG abnormalities occur during NH in people with type 1 diabetes, supporting the cardiac basis for "dead in bed" syndrome.

Gill GV, Woodward A, Casson IF et al (2009) Cardiac arrhythmia and nocturnal hypoglycaemia in type 1 diabetes – the 'dead in bed' syndrome revisited. *Diabetologia* **52**: 42–5

DIABETES CARE

Pre-diabetes among US adolescents

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

1 This study estimated the prevalence of impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and pre-diabetes among US adolescents using data from participants aged 12–19 years on the National Health and Nutrition Examination Survey 2005–6.

2 Unadjusted prevalences of IFG, IGT and pre-diabetes were 13.1%, 3.4% and 16.1%, respectively.

3 Pre-diabetes risk was positively associated with being male and having hyperinsulinaemia, and negatively associated with being of non-Hispanic black descent.

4 Neither overweight nor number of cardiometabolic risk factors was significantly associated with pre-diabetes after adjustment for hyperinsulinaemia.

Li C, Ford ES, Zhao G et al (2009) Prevalence of pre-diabetes and its association with clustering of cardiometabolic risk factors and hyperinsulinemia among U.S. adolescents: National Health and Nutrition Examination Survey 2005–2006. *Diabetes Care* **32**: 342–7

DIABETOLOGIA

Overweight and obesity linked to CVD risk and mortality

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

1 To assess the associations of BMI, overweight and obesity with cardiovascular disease (CVD) in type 2 diabetes, 13 087 people with the condition with no history of coronary heart disease (CHD) or stroke were followed for a mean of 5.6 years for fatal or non-fatal CHD, stroke, CVD (CHD or stroke) and total mortality.

2 In total, 1922 CVD events occurred, based on 64 864 person-years.

3 Both overweight and obesity were associated with increased risk of fatal or non-fatal CHD and CVD in people with type 2 diabetes.

4 The risk of CHD was higher with increasing BMI than with stable or decreasing BMI during the study.

Eeg-Olofsson K, Cederholm J, Nilsson PM et al (2009) Risk of cardiovascular disease and mortality in overweight and obese patients with type 2 diabetes: an observational study in 13,087 patients. *Diabetologia* **52**: 65–73

"Both overweight and obesity were associated with increased risk of fatal or non-fatal coronary heart disease and cardiovascular disease in people with type 2 diabetes."