

Diabetes journals

Coronary artery calcium scoring: Does it add anything?



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The study to the right evaluates the correlates of coronary atherosclerosis (measured by coronary artery calcium) in a racially diverse group of male and female subjects with type 2 diabetes. In this study, age, systolic

blood pressure, sex and race/ethnicity were significant determinants of coronary artery calcium. Among the lipoproteins, cholesterol level was most strongly linked to coronary artery calcium. Neither inflammatory markers nor metabolic factors correlated with coronary artery calcium in models adjusted for age and sex, but measures of adipose distribution

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did. Consequently, waist-to-hip ratio and ratio of visceral to total abdominal tissue were positively associated with coronary artery calcium. Multivariate analysis of the relationship of adiposity measures to coronary artery calcium was no longer significant after inclusion of apolipoprotein B or triglyceride-rich lipoprotein cholesterol. The study concludes that traditional risk factors and race/ethnicity remain important correlates of coronary artery calcium in a cohort at elevated risk of type 2 diabetes-related cardiovascular disease. Adiposity measures are significantly associated with coronary artery calcium; however, their importance may largely be explained by abnormal apolipoprotein B or triglyceride-rich lipoprotein cholesterol.

DIABETES

Multiple risk factors of coronary artery calcium

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

- 1 Coronary artery calcium is a measure of coronary atherosclerosis.
- 2 This study aimed to evaluate factors associated with the development of atherosclerosis in a diverse group of males and females with type 2 diabetes.
- 3 Age, systolic blood pressure, sex and race/ethnicity were all significant determinants of coronary artery calcium.

4 Of the lipoproteins, the biggest predictor was the cholesterol level contained in a particle excluded from direct measures of high- and low-density lipoprotein cholesterol (triglyceride-rich lipoprotein cholesterol).

5 In sex- and age-adjusted models, adipose distribution correlated with coronary artery calcium, but inflammatory markers and metabolic factors were not linked.

6 Waist-to-hip and visceral-to-abdominal fat ratios were both predictors of atherosclerosis.

7 In multivariate models, adiposity measures were no longer significant risk factors when apolipoprotein B or triglyceride-rich lipoprotein cholesterol were included.

8 The authors conclude that while adiposity measures are significantly associated with coronary artery calcium levels, this may be explained by the presence of apolipoprotein B or triglyceride-rich lipoprotein cholesterol.

Mazzone T, Meyer PM, Kondos GT et al (2007) Relationship of traditional and nontraditional cardiovascular risk factors to coronary artery calcium in type 2 diabetes. *Diabetes* 56: 849–55

DIABETOLOGIA

Atorvastatin for CVD is cost effective

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

1 This study looked at the cost-effectiveness of atorvastatin for the primary prevention of cardiovascular disease (CVD) in people with type 2 diabetes.

2 Data from the Collaborative Atorvastatin Diabetes Study (CARDS) were collected for 2838 people aged 40–75 years who had type 2 diabetes but no recorded CVD history or elevated LDL cholesterol.

3 Participants from 32 centres in the UK and Ireland were allocated randomly to atorvastatin 10 mg a day (n = 1428) or placebo (n = 1410) and followed up for a median of 3.9 years.

4 Cost per life year gained and per quality-adjusted life year (QALY)

were estimated along with cost per end point-free life year using analysis of direct treatment costs and effectiveness.

5 The incremental cost-effectiveness ratio (ICER) was estimated to be £7608 a year free of any CARDS primary end point (any CVD event or death from any cause); £4896 free of any cardiovascular end points and £4120 free of any primary end point (major CVD events: fatal, non-fatal or silent MI, CHD death, unstable angina, coronary artery revascularisation, resuscitated cardiac arrest and fatal or non-fatal stroke).

6 The cost per life year gained was £5107 over lifetime and the cost per QALY was £6471.

6 The current acceptance threshold for the ICER is £20 000 a year. This study demonstrates that atorvastatin is well below the threshold and is therefore a cost-effective way of preventing CVD in people with type 2 diabetes.

Raikou M, McGuire A, Colhoun HM et al (2007) Cost-effectiveness of primary prevention of cardiovascular disease with atorvastatin in type 2 diabetes: results from the Collaborative Atorvastatin Diabetes Study (CARDS). *Diabetologia* 50: 733–40

DIABETES CARE

Sex, microvascular disease and geographic location: Risk factors for CHD

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

- 1 People with diabetes but no cardiovascular disease (CVD) symptoms were assessed to examine predictors of first coronary heart disease (CHD) event.
- 2 A sample of 6032 women and 5612 men from a nationwide network of hospital-based diabetes clinics was assessed for baseline retinopathy, nephropathy and foot ulcers.
- 3 Individuals were followed up for 4 years (a total of 29 069 person years) and first CHD events, including myocardial infarction, coronary artery bypass grafting, percutaneous transluminal coronary angioplasty and electrocardiogram-proven angina were recorded.
- 4 The CHD incidence rate per 1000 person years ($n=881$) was 28.8 (95% CI: 5.4–32.2) in men and 23.3 (20.2–26.4) in women.
- 5 Major CHD occurred more frequently in men (13.1 [10.9–15.4]) than women (5.8 [4.3–7.2]).
- 6 Microvascular complications were a risk factor for CHD. For major CHD, rate ratios were 1.6 (1.2–2.21) in men and 1.5 (1.0–2.2) in women.
- 7 For both sexes, age and diabetes duration were risk predictors. In men, treated hypertension and glycaemic control were also associated with CHD, and in women, lower HDL-c, higher triglycerides and microvascular complications were independent risk factors.

Avogaro A, Giorda C, Maggini M et al (2007) Incidence of coronary heart disease in type 2 diabetic men and women: impact of microvascular complications, treatment, and geographic location. *Diabetes Care* 30: 1241–7

DIABETES CARE

Masked hypertension causes higher urinary albumin excretion rate

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

- 1 A cross-sectional study of 135 normotensive people with type 2 diabetes to evaluate the association between masked hypertension and microvascular complications and echocardiograph parameters.
- 2 Participants underwent urinary albumin excretion rate (UAER) measurement, echocardiography and 24-hour ambulatory blood pressure

monitoring (ABPM).

- 3 Daytime BP of $\geq 135/85$ mmHg was classified as hypertension.
- 4 Masked hypertension was present in 40 (30%) of individuals. UAER was increased in this group ($21.3 \mu\text{g}/\text{min}$) compared with normotensive people ($8.1 \mu\text{g}/\text{min}$; $P=0.001$), as was the interventricular septum (1.01 ± 0.15 vs 0.84 ± 0.13 cm; $P=0.015$) and posterior wall (0.96 ± 0.12 vs 0.90 ± 0.10 cm; $P=0.006$) thickness.

- 5 These associations remained for daytime systolic BP once diabetes duration, sex, smoking, LDL cholesterol and HbA_{1c} values were adjusted for.

- 6 ABPM is important to identify people at high risk of CVD complications.

Leitão CB, Canani LH, Kramer CK et al (2007) Masked hypertension, urinary albumin excretion rate, and echocardiographic parameters in putatively normotensive type 2 diabetic patients. *Diabetes Care* 30: 1255–60

DIABETOLOGIA

Macroalbuminuria predicts mortality

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

- 1 This study (the Casale Monferrato) assessed the extent to which estimated glomerular filtration rate (eGFR) in people with type 2 diabetes predicts 11-year all-cause and cardiovascular mortality.
- 2 The abbreviated Modification of Diet in Renal Disease Study equation was used to estimate GFR in 1538 individuals. The prevalence of chronic kidney disease

at baseline was 34.3%.

- 3 After adjusting for cardiovascular risk factors and albumin excretion rate (AER), hazard ratios were 1.23 (95% CI: 1.03–1.47) for all-cause mortality and 1.18 (0.92–1.52) for cardiovascular mortality.

- 4 Most risk was conferred by eGFR 15–29 ml/min 1.73 m^2 , while no risk was associated with eGFR 30–59.

- 5 In an analysis stratified using AER, risk increased with decreasing eGFR only in people with macroalbuminuria.

- 6 Therefore, macroalbuminuria is likely to be the main predictor of mortality. eGFR is not an indicator in normoalbuminuric people.

Bruno G et al (2007) Estimated glomerular filtration rate, albuminuria and mortality in type 2 diabetes: the Casale Monferrato study. *Diabetologia* 50: 941–8

cardiovascular disease such as arterial stiffness and endothelial function.

- 3 Symptoms improved similarly in all treatment groups, although the higher-dose OCP reduced insulin resistance and, probably as a result, arterial stiffness worsened (PWV 7.46 vs 8.03 m/s for metformin; $P<0.05$).

- 4 OCP is preferable if contraception is needed but metformin is probably the best choice for symptomatic management of polycystic ovary syndrome, especially in those with metabolic/cardiovascular risk factors.

Meyer C et al (2007) Effects of medical therapy on insulin resistance and the cardiovascular system in polycystic ovary syndrome. *Diabetes Care* 30: 471–8

DIABETES CARE

Polycystic ovary syndrome: Metformin vs oral contraception

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

- 1 A total of 100 women (BMI: $>27 \text{ kg}/\text{m}^2$) were randomised to either higher-dose oral contraceptive (OCP), metformin or low-dose OCP.
- 2 Primary outcome measures were insulin resistance and markers of

‘Ambulatory blood pressure monitoring is important to identify people at high risk of CVD complications.’

‘Macroalbuminuria is likely to be the main predictor of mortality. eGFR is not an indicator in normoalbuminuric people.’