Diabetes journals

DIABETES CARE

HbA_{1c} may be independently related to carotid IMT

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

1 More work is needed to examine the possible relationship that glycaemic control has with carotid intima–media thickness and traditional cardiovascular (CV) risk factors in people with diabetes.

2 A sample of 2060 individuals from the community-based Atherosclerosis Risk in Communities (ARIC) study was investigated.

3 There were 1111 people with diagnosed diabetes; the remaining 949 were 'undiagnosed' (that is, they had study-defined diabetes – based on blood glucose levels – but did not self-report diagnosis and were not taking medication for diabetes).

4 A fully adjusted model was used to calculate an odds ratio (OR) for being in the highest quartile for carotid IMT rather than the lowest quartile, given an individual's HbA_{1c} status (that is, in the highest quartile or the lowest quartile).

5 For diagnosed individuals, this OR was 2.62 (95% confidence interval [CI], 1.36–5.06), and for undiagnosed individuals, the OR was 2.46 (95% CI, 1.16–5.03)

6 HbA_{1c} was also found to have a significant association with traditional CV risk factors, namely waist-to-hip ratio, triglycerides, and HDL-and LDL-cholesterol.

7 The association found between HbA_{1c} and carotid IMT suggests that glycaemic control may have an independent effect on atherosclerosis in diabetes.

Selvin E, Coresh J, Golden SH et al (2005) Glycemic control, atherosclerosis, and risk factors for cardiovascular disease in individuals with diabetes: the atherosclerosis risk in communities study. *Diabetes Care* **28**(8): 1965–73

Chronic hyperglycaemia may contribute to atherosclerosis independently of other risk factors

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It is well recognised that glycaemic control is strongly associated with microvascular disease in diabetes (for example, Stratton et al, 2000). However, the relationship between glycaemic control and macrovascular disease and atherosclerosis remains unclear.

In a cross-sectional trial of 2060 people with diagnosed and undiagnosed diabetes in The Atherosclerosis Risk in Communities Study – reported on by Selvin et al (see left) – the relationship between HbA_{1c}, carotid intima–media thickness and traditional cardiovascular risk factors were examined.

LDL-cholesterol and HDL-cholesterol, plasma triglycerides and waist-to-hip ratio were found to be significantly associated with HbA_{1c} in a multi-variate analysis. There was a stronger association between HbA_{1c} and carotid intima–media thickness.

This study identified several associations between HbA_{1c} and known risk factors for cardiovascular disease and suggests that HbA_{1c} is independently related to carotid intima–media thickness, suggesting that chronic hyperglycaemia contributes to the development of atherosclerosis, potentially independently of other risk factors.

Stratton IM, Adler AI, Neil HA et al (2000) Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *British Medical Journal* **321**(7258): 405–12

DIABETES RESEARCH AND CLINICAL PRACTICE

Statins enable treatment goals to be reached in people with the metabolic syndrome

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

1 Two commonly used definitions of the metabolic syndrome are those of the World Health Organization and the National Cholesterol Education Program Adult Treatment Panel III.

2 There are markers linked to the metabolic syndrome, such as coagulation disorders, that are not included in these definitions; continued modification of the definitions is likely, according to the author.

3 In terms of treatment of the metabolic syndrome, the author lists the important principles as early identification of risk, early initiation of effective treatment, and regular follow-up to assess lifestyle and treatment goals.

4 Lifestyle modifications are described by the author as an essential first step, but lipid-lowering therapy may also be required to achieve established treatment goals.

5 Statins are identified as the most effective lipid-lowering agents.

6 Of the statins, it is stated that rosuvastatin has been shown in people with type 2 diabetes to be more effective than atorvastatin, pravastatin or simvastatin at reducing LDL-cholesterol and helping with the attainment of treatment goals.

Tuomilehto J (2005) Cardiovascular risk: prevention and treatment of the metabolic syndrome. *Diabetes Research and Clinical Practice* **68**(Suppl 2): S28–35

'Two-year statin treatment did not have a significant effect on the incidence of silent MI.'

DIABETES CARE

Determinants of exercise capacity established

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

1 There is a known link between type 2 diabetes and reduced exercise capacity, and while associated conditions such as coronary artery disease may play a role in this, the presence of diabetes could have an independent effect too.

2 Measurements were taken in 170 people with type 2 diabetes.

3 Subclinical left-ventricular dysfunction, impaired heart rate recovery (an indicator of cardiac autonomic dysfunction) and increased HbA_{1c} were all found to independently predict reduced exercise capacity (calculated in metabolic equivalents).

4 Further trials are planned to work out the mechanisms involved.

Fang ZY, Sharman J, Prins JB, Marwick TH (2005) Determinants of exercise capacity in patients with type 2 diabetes. *Diabetes Care* **28**(7): 1643–8

DIABETES

CV risk-linked difference found in microvascular ischaemic response

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

1 Raised albumin excretion rate (AER) is a signature of damage to microvasculature in people with diabetes as well as an independent predictor of cardiovascular (CV) mortality.

2 Its link to CV mortality, the authors state, is unlikely to be causal; instead, raised AER could be a marker of damage in other microvessel beds (and thus reflect abnormalities in microvascular function).

3 The patterns of skin microvascular perfusion after artificially induced ischaemia were examined in 305 people; three distinct patterns were identified.

4 People with an 'early dominant' peak had a mean AER of 12.6 µg/min, people with an 'early non-dominant' peak had a mean AER of 7.2 µg/min and people with a 'normal' peak had a mean AER of 3.7 µg/min ($P<0.001$ for trend).

5 This is reportedly the first CV risk-linked difference in microvascular response to ischaemia to be identified.

Strain WD, Chaturvedi N, Bulpitt CJ, Rajkumar C, Shore AC (2005) Albumin excretion rate and cardiovascular risk: could the association be explained by early microvascular dysfunction? *Diabetes* **54**(6): 1816–22

'Pioglitazone led to significant improvements in HDL-cholesterol, LDL-cholesterol and triglycerides relative to rosiglitazone.'

DIABETES CARE

Pioglitazone shows better lipid effects than rosiglitazone

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

1 There is evidence to suggest that pioglitazone and rosiglitazone differ in their effect on lipids in people with type 2 diabetes.

2 Clinical trials, however, have not properly controlled for other glucose- or lipid-lowering therapies.

3 This study aimed to examine these agents' lipid and glucose effects.

4 After 4 weeks' wash-out on placebo, participants were randomised to 24 weeks of pioglitazone (n=400) or rosiglitazone (n=402).

5 Pioglitazone led to significant improvements in HDL-cholesterol, LDL-cholesterol and triglycerides relative to rosiglitazone.

Goldberg RB, Kendall DM, Deeg MA et al (2005) A comparison of lipid and glycemic effects of pioglitazone and rosiglitazone in patients with type 2 diabetes and dyslipidemia. *Diabetes Care* **28**(7): 1547–54

DIABETES CARE

No significant effect found for statin therapy on silent MI

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

1 It is conceivable that silent myocardial infarction (MI) could be a forerunner for a first coronary event in people with type 2 diabetes.

2 As such, silent MI could be a tool for cardiovascular (CV) risk stratification and a target for intervention.

3 A cheap, non-invasive and near-universally applicable method to detect silent MI is 48-hour ambulatory electrocardiography (48-h AECG).

4 In terms of intervention, statins have been linked to a reduction in silent MI in people with coronary artery disease.

5 This randomised, placebo-controlled trial (n=250) was the first to test for an effect of long-term statin therapy on the incidence of silent MI in people with type 2 diabetes.

6 Treatment consisted of a daily statin dose (initially, cerivastatin 0.4 mg was given, but this drug was withdrawn from the market during the study; thereafter, simvastatin 20 mg was used, without compromising the study's blinding).

7 One hundred and fifty-five people, all without manifest CV disease, had a valid 48-h AECG at baseline and 2 years.

8 Two-year statin treatment did not have a significant effect on the incidence of silent MI.

9 The authors use their findings to question the utility of AECG as a risk stratification tool in type 2 diabetes.

Beishuizen ED, Jukema JW, Tamsma JT et al (2005) No effect of statin therapy on silent myocardial ischemia in patients with type 2 diabetes without manifest cardiovascular disease. *Diabetes Care* **28**(7): 1675–9

DIABETES CARE

Type 2 diabetes and atherosclerosis share common genetic risk factors

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

1 Evidence exists to suggest that cardiovascular disease may not be a true clinical manifestation of type 2 diabetes, rather both conditions could have a shared causative background based in genetics, other environmental factors or a combination of both.

2 One method of understanding such a pleiotropic correlation would be to analyse whether a family history of diabetes correlates with the severity of atherosclerosis.

3 This study analysed the common carotid artery intimal–medial thickness (CCA IMT) of 620 Mexican-Americans without diabetes but with a family history of the condition.

4 After adjusting for age, sex and IMT reader effects, heritability was found to be 16% in the study population (P=0.009).

5 A scoring system was used to define the presence and prevalence of diabetes in each participant's family history.

6 An average increase of 0.006 mm of CCA IMT was found to be associated with an increase of one score point. CCA IMT thickness was measured by B-mode ultrasonography.

7 A strong association was still present after further adjustment for several cardiovascular risk factors: CCA IMT was 0.037 mm thicker in people with a family history of diabetes.

8 Although small, a genetic association was observed between a family history of diabetes and atherosclerosis.

Kao WHL, Hsueh W-C, Rainwater DL et al (2005) Family history of type 2 diabetes is associated with increased carotid artery intimal-medial thickness in Mexican Americans. *Diabetes Care* **28**(8): 1882–9

DIABETES CARE

Obesity and inactivity related to diabetes and its comorbidities

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

1 The prevalence of diabetes and its related cardiovascular (CV) comorbidities is increasing significantly in the USA. Yet, limited data exist associating individual risk factors with the prevalence of diabetes and its related CV comorbidities.

2 Data for 68 500 people from a nationally representative survey of the USA were analysed for the prevalence of diabetes by body mass index (BMI; normal weight: 18.5–25 kg/m^2; overweight: 25–30 kg/m^2; obese: 30–40 kg/m^2) and level of routine physical activity undertaken (≥30 minutes moderate to vigorous activity more than three times per week defined as physically active) individuals.

3 The prevalence of diabetes and its related CV comorbidities were found to be strongly associated with an increasing BMI independent of the level of routine physical activity undertaken.

4 The prevalence of diabetes and its related CV comorbidities were also found to be strongly associated with decreasing levels of physical activity, independent of BMI.

5 Therefore, as BMI and decreasing levels of physical activity are independently associated with an increasing prevalence of diabetes and its related CV comorbidities, further research should be undertaken to determine more independent risk factors, the authors conclude.

Sullivan PW, Morrato EH, Ghushchyan V et al (2005) Obesity, inactivity, and the prevalence of diabetes and diabetes-related cardiovascular comorbidities in the U.S., 2000–2002. *Diabetes Care* **28**(7): 1599–603

'BMI and decreasing levels of physical activity are independently associated with an increasing prevalence of diabetes and its related CV comorbidities.'

DIABETES CARE

No effect found for statins on endothelial function

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

1 Existing evidence for the effect of short-term statin therapy with respect to flow-mediated dilation (FMD) in people with type 2 diabetes but no apparent cardiovascular disease (CVD) is contradictory.

2 In order to address this, a randomised, placebo-controlled double-blind trial was conducted on 250 people with type 2 diabetes.

3 Participants were given either cerivastatin 0.4 mg daily (but this drug was withdrawn from the market during the study; thereafter, simvastatin 20 mg was used, without compromising the study's blinding) or placebo.

4 B-mode ultrasound was used to assess changes in FMD, the primary endpoint.

5 Determinants of baseline FMD include diabetes duration and common carotid artery intima–media thickness.

6 FMD at baseline was 1.51% in the placebo group and 1.66% in the statin intervention group. No significant difference was found at study end, 2 years later.

7 Therefore, the authors conclude that medium-dose statin therapy is unable to reverse FMD.

8 As statins have been shown to improve FMD in people without diabetes but with hypercholesterolaemia, possibly by upregulating nitric oxide synthase expression, the authors propose that in people with diabetes CVD risk may be caused by a mechanism other than nitric oxide synthase availability.

Beishuizen ED, Tamsma JT, Jukema JW et al (2005) The effect of statin therapy on endothelial function in type 2 diabetes without manifext cardiovascular disease. *Diabetes Care* **28**(7): 1668–74

'In people with diabetes CVD risk may be caused by a mechanism other than nitric oxide synthase availability.'