Diabetes journals

DIABETES CARE

Fenofibrate reduces the risk of CVD in people with the metabolic syndrome

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

1 The aim of this study was to see if cardiovascular disease (CVD) risk and the effect of fenofibrate treatment differed in people with or without various features of metabolic syndrome.

2 The features of metabolic syndrome have been defined by the Adult Treatment Panel III (ATP III) and include abdominal obesity, dyslipidaemia, hypertension and glucose deregulation.

3 Participants were split into two groups: placebo, of which 4103 had metabolic syndrome and 793 did not, and fenofibrate, of which 4080 had metabolic syndrome and 815 did not; 80% of all participants met the ATP III criteria for metabolic syndrome.

4 Each feature, bar abdominal obesity, was found to increase the risk of CVD by at least 3% over a period of 5 years. Those with dyslipidemia were at the highest risk of CVD, at 17.8% over 5 years.

5 Fenofibrate was successful in reducing the risk of CVD. Its greatest success was in people with dyslipidemia, with a 27% reduction in relative risk (95% confidence interval 9–42, P=0.005). It was also successful in reducing risk in people with low HDL-cholesterol or hypertension.

6 The authors concluded that the greatest benefits of fenofibrate are observed in individuals with hypertriglyceridaemia; those with no history of CVD had greater risk reductions overall.

Scott R, O'Brien R, Fulcher G et al (2009) Effects of fenofibrate treatment on cardiovascular disease risk in 9,795 individuals with type 2 diabetes and various components of the metabolic syndrome: the Fenofibrate Intervention and Event Lowering in Diabetes (FIELD) study. *Diabetes Care* **32**: 493–8

Cardiovascular disease, type 2 diabetes and the metabolic syndrome: Effects of fenofibrate treatment

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This study by Scott et al (summarised alongside) explored whether cardiovascular disease (CVD) risk and the effects of fenofibrate differed in people with type 2 diabetes with and without various metabolic syndrome characteristics, as defined by the Adult Treatment Panel (ATP) III criteria in the FIELD (Fenofibrate Intervention and Event lowering in Diabetes) study.

Over 80% of the nearly 10 000 subjects enrolled in the study met the ATP III criteria for metabolic syndrome, illustrating the high prevalence of the metabolic syndrome in people with type 2 diabetes. Each individual feature of the metabolic syndrome increased the risk of cardiovascular (CV) events over 5 years by at least 3%. The highest risk was observed in individuals with dyslipidaemia defined by plasma triglyceride ≥2.3 mmol/L and low HDL-cholesterol (17.8% over 5 years). Indeed, marked hypertriglyceridaemia, with or without low HDL-cholesterol, was associated with a higher CVD risk than meeting the ATP III criteria for the metabolic syndrome. The largest effect of fenofibrate was observed in people with this dyslipidaemic profile, in whom a 27% relative risk reduction was observed.

> ***"These findings should be of interest to physicians considering further lipid-lowering therapies to optimise cardiovascular risk reduction beyond that related to statin therapy alone."***

These data demonstrate that, even in the presence of established type 2 diabetes, metabolic syndrome phenotype still confers important prognostic information with respect to CVD risk. In keeping with studies such as INTERHEART (Yusuf et al, 2004), dyslipidaemia – in particular elevated plasma triglyceride and low HDL-cholesterol – appeared to be particularly important as a CVD risk factor. Multivariate analysis confirmed the independent contribution of plasma triglyceride, low HDL-cholesterol and blood pressure to CV risk, while the impact of waist circumference was substantially explained by these factors.

The observations of this study, therefore, further support hypertriglyceridaemia as an important marker for CVD risk in people with type 2 diabetes. Furthermore, therapy with agents that primarily reduce triglyceride as well as increasing HDL-cholesterol, such as fibrates, appeared to be particularly beneficial in people with elevated triglyceride and reduced HDL-cholesterol levels. These findings should, therefore, be of interest to physicians considering further lipid-lowering therapies to optimise CV risk reduction beyond that related to statin therapy alone.

Yusuf S, Hawken S, Ounpuu S et al (2004) Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet* **364**: 937–52

"Anthropometric measurements of central adiposity were no more useful in predicting type 2 diabetes than central obesity measures in non-Hispanic white and Hispanic individuals."

DIABETES CARE

The effect of ethnicity when predicting type 2 diabetes

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

1 This study was carried out to look at whether ethnicity has any effect on the ability to predict type 2 diabetes when combined with anthropometric measurements.

2 The 1073 participants without diabetes, aged 40–69 years, were classified by their ethnicity: non-Hispanic White (nHW), African–American (AA) and Hispanic (HA).

3 Of all participants, 56% were female and 40% were nHW, 34% were HA and 26% were AA.

4 Each participant had the following anthropometric measurements taken: height, weight, waist circumference, hip circumference and skinfold thicknesses (triceps and sunscapular).

5 When follow-up examinations were made approximately 5.2 years later, 146 cases of type 2 diabetes had developed. They were diagnosed by an oral glucose tolerance test.

6 It was found that waist–height ratio was the most useful predictor, followed closely by BMI. There were no significant differences between genders.

7 The study found that in nHW and HA people, anthropometric measurements of central adiposity were no more useful in predicting type 2 diabetes than central obesity measures.

8 In AA individuals, central obesity measures may be useful in predicting diabetes, although given the size of this study, more research is needed.

MacKay MF, Haffner SM, Wagenknecht LE et al (2009) Prediction of type 2 diabetes using alternate anthropometric measures in a multi-ethnic cohort: the insulin resistance atherosclerosis study. *Diabetes Care* **32**: 956–8

DIABETES CARE

Metabolic syndrome definitions

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

1 Three definitions of metabolic syndrome were studied to see if they could predict cardiovascular (CV) events, CV- and diabetes-related mortality and the progression of renal disease in type 1 diabetes.

2 Definitions were set by the World Health Organization (WHO), National Cholesterol Education Program (NCEP) and International Diabetes Federation (IDF).

3 People between the ages of 25 and 49 who had diabetes for between 11 and 35 years were followed-up after a median of 5.5 years.

4 The WHO definition showed over a 2-fold risk in both CV events and CV- and diabetes-related mortality. The NCEP definition showed an increased risk associated with elevated albuminuria. The IDF definition did not predict outcomes.

Thorn LM, Forsblom C, Wadén J et al (2009) Metabolic syndrome as a risk factor for cardiovascular disease, mortality, and progression of diabetic nephropathy in type 1 diabetes. *Diabetes Care* **32**: 950–2

DIABETES CARE

Hyperglycaemia in stroke patients treated with IV-tPA

	✓✓✓
	✓✓✓
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1 The association between hyperglycaemia (blood glucose >8.0 mmol/L) in the hyperacute phase, and increased mortality, symptomatic intracerebral haemorrhage (SIH) and poor functional status at 90 days, was studied in 1098 stroke patients treated with intravenous tissue plasminogen activator (IV-tPA).

2 The results showed that 296 people (27%) had admission hyperglycaemia. In total, this was 70% of individuals with diabetes and 18% of those without.

3 Risk of mortality, SIH and negative 90-day outcomes increased as blood glucose admission increased. This was true both of people with and without diabetes.

4 The authors concluded that in this group of IV-tPA treated individuals, there was a clear link between hyperglycaemia and risk of mortality, SIH and poor functional status at 90 days.

Poppe AY, Majumdar SR, Jeerakathil T et al (2009) Admission hyperglycemia predicts a worse outcome in stroke patients treated with intravenous thrombolysis. *Diabetes Care* **32**: 617–22

DIABETES CARE

Treatment after AMI

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

1 A total of 1115 people with type 2 diabetes who survived acute myocardial infarction (AMI) took part in this trial that looked at how two different treatments affect the risk of cardiovascular (CV) outcomes.

2 Participants were randomised to two groups: prandial (three pre-meal doses of insulin lispro, targeting 2-hour postprandial blood glucose <7.5 mmol/L) or basal (NPH insulin twice-daily or insulin glargine once-daily, targeting fasting/pre-meal blood glucose <6.7 mmol/L).

3 The basal group showed lower mean fasting blood glucose (7.0 vs. 8.1 mmol/L; $P<0.0001$) and higher daily levels of mean postprandial blood glucose (8.6 vs. 7.8 mmol/L; $P<0.01$) and 2-hour postprandial blood glucose excursion (1.3 vs. 0.1 mmol/L; $P<0.001$).

4 It was expected that differences would be greater. These treatments showed no differences in the risk of future CV events.

Raz I, Wilson PW, Strojek K et al (2009) Effects of prandial versus fasting glycemia on cardiovascular outcomes in type 2 diabetes: the HEART2D trial. *Diabetes Care* 32: 381–6

DIABETES CARE

CVD risk factors and glycaemia

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

1 The relationship between various cardiovascular disease (CVD) risk factors (blood pressure, triglycerides, HDL- and LDL-cholesterol and LDL peak particle density) and glycaemia was studied in three groups of participants: intensive lifestyle intervention (ILS), metformin and placebo. All participants (n=3234) with impaired glucose tolerance were followed-up for a mean of 3.2 years.

2 Risk factor levels were estimated to see any annual change, increase or worsening of glycaemic levels.

3 Results showed an increase in risk of CVD as glucose tolerance status decreased, but this could be reversed, particularly in the ILS group, if normal glucose tolerance was reverted to. This is not true of the metformin group.

Goldberg RB, Temprosa M, Haffner S et al (2009) Effect of progression from impaired glucose tolerance to diabetes on cardiovascular risk factors and its amelioration by lifestyle and metformin intervention: the Diabetes Prevention Program randomized trial by the Diabetes Prevention Program Research Group. *Diabetes Care* **32**: 726–32

DIABETOLOGIA

Hyperglycaemia as a predictor of mortality

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

1 This study looked at whether the risk of all-cause and cardiovascular disease (CVD) mortality is increased in fasting plasma glucose (FPG), 2-hour plasma glucose (2hPG) and HbA_{1C} measures, and if these measures can improve the prediction of risk of mortality.

2 The study comprised 10 026 people aged ≥25 years diagnosed diabetes who were assessed against the three measures. After 7 years there had been 332 all-cause deaths and 88 CVD deaths.

3 The relationship between all-cause and CVD mortality was found to be linear in 2hPG and HbA_{1C}, and J-shaped in FPG.

4 It was found that 2hPG and FPG were strong predictors of all-cause mortality and all three measures were predictors of CVD mortality. No measure significantly improved the prediction in mortality risk over current methods.

Barr EL, Boyko EJ, Zimmet PZ et al (2009) Continuous relationships between non-diabetic hyperglycaemia and both cardiovascular disease and all-cause mortality: the Australian Diabetes, Obesity, and Lifestyle (AusDiab) study. *Diabetologia* **52**: 415–24

DIABETES CARE

Causes of diabetes in people with chronic heart failure

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

1 The aim of this study was to identify causes of diabetes in individuals with chronic heart failure (CHF).

2 Baseline demographic, medication and laboratory data were compared for all 1620 participants. In a median period of 2.8 years, 126 were diagnosed with diabetes.

3 The results showed that the strongest predictors of diabetes were a higher HbA_{1C} (odds ratio [OD] 1.78 per 1 standard deviation [SD] increase; P<0.0001) and a higher BMI (OD 1.64 per 1 SD increase; P<0.0001).

4 Other predictors, in decreasing order of effect, were lipid-lowering therapy, lower serum creatinine concentration, diuretic therapy, digoxin therapy, higher serum alanine aminotransferase concentration and lower age.

Preiss D, Zetterstrand S, McMurray JJ et al (2009) Predictors of development of diabetes in patients with chronic heart failure in the Candesartan in Heart Failure Assessment of Reduction in Mortality and Morbidity (CHARM) program. *Diabetes Care* **32**: 915–20

DIABETES CARE

Community-based support could help prevent CHD and type 2 diabetes

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

1 This US study was undertaken to see if the DEPLOY (Diabetes Education and Prevention with a Lifestyle Intervention Offered by the YMCA) had decreased the 10-year composite risk of chronic heart disease (CHD) in overweight adults with abnormal glucose metabolism.

2 The study was carried out at two YMCA sites with 92 participants. One site delivered an adaptation of the Diabetes Prevention Program lifestyle intervention while the other offered standard YMCA wellness programmes.

3 Participants had a BMI of ≥24 kg/m^2, an abnormal whole blood glucose concentration and an America Diabetes Association questionnaire score of 10 or over.

4 Body weight, systolic blood pressure, HbA_{1C}, total and HDL-cholesterol were measured at baseline, 4–6 months and at 12–14 months.

5 Mean baseline 10-year CHD risk at study start was similar in both groups (P=0.667).

6 At 4 and 12 months the intervention group showed a reduced 10-year risk whereas the control group reported an insignificant decrease after 4 months and an increase after 12 months.

7 The intervention group also showed a decrease in total cholesterol to HDL-cholesterol levels that was not seen in the control group. This may explain the 10-year CHD risk reduction.

8 The authors concluded that community-based support could help to prevent both CHD and type 2 diabetes in adults with pre-diabetes.

Lipscombe 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

"The strongest predictors of diabetes were a higher HbA_{1C} (P<0.0001) and a higher BMI (P<0.0001)."