Diabetes journals

DIABETES CARE

Elevated WBC count linked with vascular complications

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

1 This study explored the association between white blood cell (WBC) count and the presence of macrovascular and microvascular complications in patients with type 2 diabetes.

2 In this study, 3776 Chinese patients with type 2 diabetes and normal WBC count underwent a comprehensive assessment of complications and cardiovascular risk factors based on the European DiabCare protocol.

3 Patients with higher WBC counts had adverse metabolic profiles as evidenced by higher blood pressure, body mass index, HbA_{1c}, fasting plasma glucose, low-density lipoprotein cholesterol, triglycerides and urinary albumin excretion, but lower high-density lipoprotein cholesterol.

4 The prevalence of vascular complications increased in a dosage-related manner with WBC count.

5 After adjustments for smoking and other known cardiovascular risk factors, a 1-unit increment of WBC count was associated with a 15.8% and 12.3% increase in the prevalence of macrovascular and microvascular complications, respectively.

6 Elevated WBC count, even within the normal range, is associated with both macrovascular and microvascular complications in type 2 diabetes.

7 Chronic inflammation, as indicated by a higher WBC count, may play a linkage role in the development of macrovascular and microvascular complications in diabetes.

Tong PC, Lee KF, So WY et al (2004) White blood cell count is associated with macro- and microvascular complications in Chinese patients with type 2 diabetes. *Diabetes Care* **27**: 216–22

Chronic systemic inflammation and the development of diabetes complications

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Chronic systemic information appears to play a significant role in the pathophysiology of metabolic syndrome X and type 2 diabetes. Thus plasma levels of C-reactive protein (CRP), tumour necrosis factor α (TNF-α) and interleukin-6 are elevated in patients with obesity, insulin resistance, essential hypertension, type 2 diabetes and coronary heart disease.

Associations have been reported between another manifestation of chronic low-grade inflammation: raised white cell count, and coronary artery disease and the metabolic syndrome in the general population. This paper examines, in a cross-sectional cohort study, the association between white cell blood count and the presence of macrovascular and microvascular complications in patients with type 2 diabetes of Chinese origin. In a study population of 3776 patients, a comprehensive evaluation was undertaken of microvascular and macrovascular complications, cardiovascular risk factors, together with the usual demographic, anthropometric and metabolic parameters.

Higher white cell counts within the normal range were associated with adverse metabolic profiles, including higher blood pressures, increased body mass index, higher HbA_{1c} levels, fasting blood glucose, LDL cholesterol and urinary albumin excretions. The white blood cell count increases were associated with, subsequent to correction for smoking, the prevalence of microvascular and macrovascular complications. Thus elevated white cell counts, even within the normal range, appear to be associated with microvascular and macrovascular disease in type 2 diabetes in this population.

This study provides further information on the potential aetiological role for chronic inflammation in the development of complications of diabetes.

DIABETOLOGIA

Post-challenge glucose predicts CVD and mortality

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

1 To assess the relationship between glucose concentrations and mortality, together with other established risk factors in Asian populations, the authors analysed the follow-up data from the Diabetes Epidemiology: Collaborative Analysis of Diagnostic Criteria in Asia (DECODA) Study.

2 The study assessed how well fasting plasma glucose (FPG) and 2-hour post-challenge plasma glucose (2-h PG) predicted cardiovascular disease (CVD) and all-cause mortality in 6817 Asian people.

3 An increase in FPG from 7.0 mmol/l to 8.0 mmol/l increased relative risk by 1.14 for all-cause and 1.24 for CVD mortality. An increase in 2-h PG from 9.0 mmol/l to 11.9 mmol/l increased relative risks by 1.29 and 1.35, respectively.

4 This study, which was based on five cohorts with populations of Asian origin and had a 5-year median follow-up, showed that 2-h PG was an independent predictor of CVD and all-cause mortality among people without previously diagnosed diabetes.

Nakagami T and the DECODA Study Group (2004) Hyperglycaemia and mortality from all causes and from cardiovascular disease in five populations of Asian origin. *Diabetologia* 10.1007/s00125-004-13334-6

'This study investigated whether the risk of myocardial infarction (MI) or stroke being fatal in type 2 diabetes can be estimated using information available when the diabetes was diagnosed.'

DIABETES CARE

Risk factors for stroke in diabetes

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

1 This study investigated whether the risk of myocardial infarction (MI) or stroke being fatal in type 2 diabetes can be estimated using information available when the diabetes was diagnosed.

2 Analyses were based on 674 cases of MI (351 fatal) that occurred in 597 of 5102 patients from the UK Prospective Diabetes Study (UKPDS) for whom covariate date were available during a median follow-up of 7 years.

3 Multivariate logistic regression was used to examine differences in risk factors, measured during the first 2 years after diagnosis of diabetes, between those with fatal MI and those with non-fatal MI. Similar analyses were performed for 234 strokes (48 fatal) that occurred in 199 patients.

4 Patients with fatal MI had higher HbA_{1c} than those with non-fatal MI (odds ratio 1.17 per 1% HbA_{1c}, P=0.014). Patients with fatal stroke had higher HbA_{1c} than those with non-fatal stroke (odds ratio 1.37 per 1% HbA_{1c}, P=0.007).

5 Other risk factors for MI case fatality included increased age, blood pressure and urine albumin level.

6 The risk of MI or stroke being fatal in type 2 diabetes is linked with risk factors, such as HbA_{1c}, measured many years before the onset of MI or stroke.

7 This analysis adds to the risk engine equations for MI and stroke case fatality to enable estimation of the probability of fatal coronary heart disease and fatal stroke within the UKPDS Risk Engine or other models.

Stevens RJ, Coleman RL, Adler AI, Stratton IM, Matthews DR, Holman RR (2004) Risk factors for myocardial infarction case fatality and stroke case fatality in type 2 diabetes. *Diabetes Care* **27**: 201–07

'The risk of MI or stroke being fatal in type 2 diabetes is associated with risk factors, including HbA_{1c}, measured many years before the onset of MI or stroke.'

DIABETES CARE

Albuminuria is a predictive risk factor for CHD

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

1 The goal of the study was to examine risk factors in the prediction of coronary heart disease (CHD) and differences in risk factors in men and women in the EuroDiab Prospective Complications Study.

2 Baseline risk and CHD at follow-up were assessed in 2329 patients with type 1 diabetes without CHD.

3 There were 151 patients who developed CHD; the 7-year incidence rate was 8.0 (per 1000 person-years) in men and 10.2 in women.

4 Age, albumin excretion rate, waist–hip ratio, smoking, fasting triglycerides or high-density lipoprotein cholesterol, and systolic blood pressure were predictors of CHD; baseline albuminuria was predictive of the pathogenesis of CHD in type 1 diabetes.

Soedamah-Muthu SS, Chaturvedi N, Toeller M et al (2004) Risk factors for coronary heart disease in type 1 diabetic patients in Europe. *Diabetes Care* **27**: 530–37

DIABETIC MEDICINE

Advanced treatment needed for diabetic patients with MI

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

1 The aim of the study was to assess hospital mortality and morbidity in patients with and without diabetes and with acute myocardial infarction (MI; 126 and 204 patients, respectively), and to compare the results between the two groups.

2 Mortality within 24 h of admission was 13.5% in patients with diabetes and 5.4% in patients without diabetes. Mortality during the entire hospitalisation was higher in those without diabetes than in those without.

3 Preceding MI, microalbuminuria, peripheral artery disease and arterial hypertension were more frequent in patients with diabetes than in those without diabetes.

4 The need for advanced treatment strategies early in the course of patients with diabetes and MI is emphasised.

Otter W, Kleybrink S, Doering W, Standl E, Schell O (2004) Hospital outcome of acute myocardial infarction in patients with and without diabetes mellitus. *Diabetic Medicine* **21**: 183–87

DIABETES CARE

Cardiorespiratory fitness and CVD risk

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

1 This study examined differences in novel markers of cardiovascular disease (CVD) in women with type 2 diabetes stratified according to cardiorespiratory fitness.

2 Twenty-eight women with type 2 diabetes who were free from CVD were placed into low cardiorespiratory fitness or average cardiorespiratory fitness groups; eight women without diabetes were controls.

3 Conventional CVD risk factors (e.g. blood pressure, body mass index and lipid profile) and novel CVD risk factors (e.g. fasting insulin and C-reactive protein (CRP)) were assessed.

4 CRP was 3.3-fold higher in the low cardiorespiratory fitness group; other novel markers of CVD were not significantly different between groups.

5 Low cardiorespiratory fitness is associated with elevated CRP and reduced fasting glucose control in women with type 2 diabetes.

McGavock JM, Mandic S, Vonder Muhll I et al (2004) Low cardiorespiratory fitness is associated with elevated C-reactive protein levels in women with type 2 diabetes. *Diabetes Care* **27**: 320–25

DIABETES CARE

Insulin resistance quantified using indirect methods

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

1 The goal of this study was to identify a reliable, yet simple and indirect, method for the detection of insulin resistance (IR).

2 In total, 65 patients without diabetes were randomly selected. Blood samples were taken after a 12 h overnight fast to determine plasma lipid, glucose and insulin levels.

3 An intravenous glucose tolerance test with administration of insulin after 20 minutes and extraction of multiple blood samples for glucose and insulin measurements, and calculation of the minimal model approximation of the metabolism of glucose (MMAMG) S_i value were performed. Three indirect indices to predict IR were calculated.

4 Compared with the S_i value, the most sensitive and specific indirect methods were the McAuley index and the presence of the metabolic syndrome.

Ascaso JF, Pardo S, Real JT, Lorente RI, Priego A, Carmena R (2003) Diagnosing insulin resistance by simple quantitative methods in subjects with normal glucose metabolism. *Diabetes Care* **26**: 3320–25

DIABETES CARE

Low levels of adiponectin indicate risk of CVD

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

1 This study determined cross-sectional and prospective associations of adiponectin concentration with adiposity, type 2 diabetes and cardiovascular disease (CVD) risk factors in a population-based study of Native Canadians, a group undergoing rapid epidemiological transition.

2 Between 1993–95, 728 participants were assessed for glucose, insulin, adiponectin and lipids after an overnight fast. Waist circumference and percentage body fat were measured, and a glucose tolerance test was administered. In 1998, 95 high-risk patients were followed up.

3 Adiponectin concentrations were significantly lower in men versus women, and in patients with type 2 diabetes versus those with normal glucose tolerance.

4 Population-based findings support the hypothesis that low circulating levels of adiponectin are an important determinant of risk of CVD.

Hanley AJG, Connelly PW, Harris SB, Zinman B (2003) Adiponectin in a Native Canadian population experiencing rapid epidemiological transition. *Diabetes Care* **26**: 3219–25

DIABETES CARE

Impaired glucose tolerance results in high WBC count

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

1 Impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) differ in their risk of all-cause and cardiovascular mortality.

2 Differences between patients with IFG and those with IGT were evaluated using the white blood cell (WBC) count as a marker of subclinical inflammation.

3 In total, 4720 Japanese men without diabetes, aged 24–84 years, were classified into four groups according to IFG and IGT. The WBC count was compared between groups.

4 Individuals with isolated IGT had a significantly higher WBC count than those with isolated IFG.

Ohshita K, Yamane K, Hanafusa M et al (2004) Elevated white blood cell count in subjects with impaired glucose tolerance. *Diabetes Care* **27**: 491–96

DIABETES CARE

Pravastatin reduces inflammation markers in type 2 diabetes

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

1 The objective was to evaluate the effect of pravastatin on coagulation and inflammation markers in patients with type 2 diabetes.

2 Fifty patients with type 2 diabetes and serum cholesterol of 5–10 mmol/l were assessed on day 1, after the first period of 8 weeks on pravastatin or no treatment, at which time pravastatin or no treatment was crossed over for another 8 weeks, and after 16 weeks at the end of the study.

3 Blood samples were assessed for plasma levels of fibrinogen, F1+2, D-dimer, soluble tissue factor (sTF), von Willebrand Factor antigen (vWFag) and C-reactive protein (CRP).

4 Significant reductions of total cholesterol, low-density lipoprotein cholesterol and triglycerides were seen after 8 weeks of pravastatin treatment.

5 Significant reductions of plasma levels of F1+2, vWFag and sTF were observed after treatment with pravastatin. Plasma levels of CRP were also significantly reduced. Levels of fibrinogen and D-dimer did not decrease after pravastatin treatment.

6 The results indicated that pravastatin reduced levels of coagulation and inflammation markers in patients with type 2 diabetes. These anti-thrombotic and anti-inflammatory effects of treatment with statins could play a role in reducing cardiovascular complications in patients with type 2 diabetes.

Sommeijer DW, MacGillavry MR, Meijers JCM, Van Zanten AP, Reitsma PH, Ten Cate H (2004) Anti-inflammatory and anticoagulant effects of pravastatin in patients with type 2 diabetes. *Diabetes Care* **27**: 468–73

'The objective was to evaluate the effect of pravastatin on coagulation and inflammation markers in patients with type 2 diabetes.'

'These anti-thrombotic and anti-inflammatory effects of treatment with statins could play a role in reducing cardiovascular complications in patients with type 2 diabetes.'