Clinical *DIGEST 2*

Cardiovascular journals

EECP relieves angina in patients with diabetes

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

1 This report describes a prospective, observational study of patients with diabetes undergoing enhanced external counterpulsation (EECP) for the treatment of chronic, stable angina who were enrolled in the International EECP Patient Registry (IEPR).

2 Of 1532 IEPR patients studied, 43% had diabetes at baseline. Patients with diabetes were experiencing on average 11 episodes of angina per week.

3 Most patients had been revascularised with previous percutaneous coronary intervention or coronary artery bypass graft surgery (86%), and most were considered unsuitable for either additional procedure (87%).

4 In 79% of patients, daily 1–2 h treatment sessions of EECP were typically administered for a total course of 35 h (mean 32 h).

5 Immediately after EECP, 69% of patients with diabetes demonstrated a reduction in angina of ≥1 Canadian Cardiovascular Society angina class.

6 After 1 year, maintenance of angina reduction was reported in 72% of patients with diabetes.

7 Despite a high-risk profile in the group with diabetes in this study, 1-year mortality was similar to coronary intervention registry populations.

8 This study suggests that in select patients with diabetes, EECP can be a safe, effective, well-tolerated treatment option for the relief of angina.

Linnemeier G, Rutter MK, Barsness G, Kennard ED, Nesto RW (2003) Enhanced external counterpulsation for the relief of angina in patients with diabetes: safety, efficacy and 1-year clinical outcomes. American Heart Journal **146**: 453–58

Enhanced external counterpulsation eases angina in diabetes

Miles Fisher, Consultant Physician, Glasgow Royal Infirmary

Intervention for coronary artery disease in patients with diabetes remains problematic. For patients with triple-vessel disease, coronary artery bypass grafting (CABG) is the treatment of choice, yet both short-term and long-term outcomes are worse than in people without diabetes. Percutaneous coronary intervention (PCI) is associated with a higher re-stenosis rate in patients with diabetes.

Enhanced external counterpulsation (EECP) is a new, non-invasive treatment for angina. The EECP device consists of three pairs of pneumatic cuffs applied to the legs. Cuffs are inflated sequentially during diastole, returning blood from the legs to the central circulation. The cuffs are deflated at end-diastole. A treatment session lasts between 1–2 h, and a total treatment course is 35 h.

This article by Linnemeier et al describes a subgroup analysis of patients with diabetes enrolled in the International EECP Patient Registry (IEPR). Of 1532 IEPR patients studied, 43% had known diabetes at baseline. Most had either been previously treated with CABG or PCI and were considered unsuitable for additional invasive procedures. They were experiencing on average 11 episodes of angina per week.

Most patients with diabetes completed the treatment course, and most benefited with a reduction in angina. In the majority of patients, benefit continued after 1 year. At 1-year follow-up, mortality in the 572 patients with diabetes was increased compared with the 779 patients without diabetes, as were major adverse coronary events and congestive cardiac failure. Despite this, EECP may be useful in patients with diabetes and severe cardiovascular disease who are unsuitable for further coronary intervention.

Diabetes is a risk factor for adverse surgery outcome

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

1 This study estimates the risk of adverse outcome (AO), defined as in-hospital death or permanent stroke, associated with elective surgery of the ascending aorta and the aortic arch.

2 AO was analysed in 372 patients who underwent proximal repair and in 92 patients who underwent aortic arch replacement from 1986 to the present.

3 Preoperative risk factors with a P-value <0.2 in a univariate analysis were entered into a multivariate model, and an equation incorporating independent risk factors was derived separately for proximal aorta and arch surgery.

4 Age >65 years, diabetes, cause and prolonged total cerebral protection time were significant univariate risk factors for elective proximal repair. Diabetes, atherosclerosis and dissection were independent factors.

5 For elective arch surgery, female sex, age >65 years, coronary artery disease, diabetes, cause and prolonged total cerebral protection time were univariate risk factors. Female sex, coronary artery disease, diabetes and total cerebral protection time were independent factors.

6 In this large series of patients, the presence of diabetes and manifestations of atherosclerosis emerge as extremely important risk factors for AO after ascending aorta or arch surgery, displacing age. Multivariate equations derived from these data enable more precise calculation of risk for each individual contemplating elective surgery.

Hagl C, Galla JD, Spielvogel D et al (2003) Diabetes and evidence of atherosclerosis are major risk factors for adverse outcome after elective thoracic aortic surgery. Journal of Thoracic and Cardiovascular Surgery **126**: 1005–12

> *'The concentration of CRP measured before stenting tended to be greater in patients with diabetes compared with those without diabetes.'*

AMERICAN JOURNAL OF CARDIOLOGY

Diabetes affects the inflammatory response to stenting

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

1 Patients with diabetes are at increased risk for adverse events after coronary stenting, perhaps reflecting a pro-inflammatory state.

2 To characterise the inflammatory response to coronary stenting in patients with and without diabetes, blood samples were obtained from 75 patients before stenting, and 10 minutes, 1 h and 24 h later.

3 Concentrations of C-reactive protein (CRP), interleukin (IL)-6, IL-1-receptor antagonist and soluble CD40 ligand were assayed in each sample by enzyme-linked immunosorbent assay.

4 Overall, 88% of patients had an acute coronary syndrome; 36% had elevations in blood markers of cardiac injury, and 52% had unstable angina without an elevation of cardiac markers. Twenty-one patients (28%) had diabetes.

5 The concentration of CRP measured before stenting tended to be greater in patients with diabetes compared with those without diabetes.

6 The relative increase in CRP concentration after stenting was 15% in patients with diabetes and 74% in patients without diabetes, resulting in overall concentrations being similar over the 24 h in both patient groups.

7 This study showed a temporal difference in the pattern and intensity of inflammation in response to coronary stenting in patients with diabetes compared with those without diabetes.

> *'This study showed a temporal difference in the pattern and intensity of inflammation in response to coronary stenting in patients with diabetes compared with those without diabetes.'*

Aggarwal A, Schneider DJ, Sobel BE, Dauerman HL (2003) Comparison of inflammatory markers in patients with diabetes mellitus versus those without before and after coronary arterial stenting. American Journal of Cardiology **92**: 924–29

INTERNATIONAL JOURNAL OF CARDIOLOGY

Diabetes is a risk factor for acute MI

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

1 This study investigated the risk factor profiles of 65 young patients (≤45 years) presenting to a Saudi Arabian hospital with acute myocardial infarction (MI) over 3 years.

2 Smoking was the major risk factor (76.9%), followed by low levels of high-density lipoprotein (52.8%), high levels of low-density lipoprotein (33.8%) and diabetes (30.8%).

3 Comparing these young patients with those of all different age groups shows that they are more likely to suffer from acute MI with ST segment elevation and to have a higher prevalence of dyslipidaemia but a lower frequency of hypertension.

4 These observations are important for the primary prevention of coronary artery disease in young people in Saudi Arabia.

Al-Khadra AH (2003) Clinical profile of young patients with acute myocardial infarction in Saudi Arabia. International Journal of Cardiology **91**: 9–13

STROKE

QTc interval prolongation predicts strokes in diabetes

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

1 Heart-rate-corrected QT (QTc) interval prolongation is a predictor of cardiovascular morbidity and mortality in general populations and in patients with diabetes.

2 The aim of this study was to investigate the predictors of stroke in patients with type 2 diabetes, with particular emphasis on the independent role of QT interval parameters.

3 Several clinical, laboratory, ECG and echocardiographic variables were recorded at baseline in 471 patients with type 2 diabetes. After a median follow-up of 57 months, 40 incident strokes were observed.

4 It was found that QTc interval prolongation was an independent predictor of stroke, and thus can be used as a predictor of future strokes in patients with type 2 diabetes.

Cardoso CRL, Salles GF, Deccache W (2003) QTc interval prolongation is a predictor of future strokes in patients with type 2 diabetes mellitus. Stroke **34**: 2187–94

STROKE

Diabetes impairs vasodilatory response to hypercapnia

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

1 This study examined the effects of diabetes and its severity on the cerebral vasodilatory response to hypercapnia.

2 Thirty patients with diabetes who were consecutively scheduled for elective major surgery were studied.

3 After induction of anaesthesia, a 2.5 MHz-pulsed transcranial Doppler probe was attached to the patient's head at the right temporal window, and mean blood flow velocity of the middle cerebral artery (Vmca) was measured continuously. All measurements were repeated when end-tidal CO_2 increased and remained stable for 5–10 minutes.

4 Patients with diabetes have an impaired vasodilatory response to hypercapnia compared with controls without diabetes. The degree of impairment is related to the severity of the diabetes.

Kadoi Y, Hinohara H, Kunimoto F et al (2003) Diabetic patients have an impaired cerebral vasodilatory response to hypercapnia under propofol anaesthesia. Stroke **34**: 2399–2403

STROKE

Diabetes is a major determinant of SCIs in hypertension

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

1 Silent cerebral infarcts (SCIs), often found in the elderly or patients with hypertension, are powerful predictors of clinical stroke.

2 The prevalence and determinants of SCI in patients with hypertension, with or without diabetes was studied.

3 The impact of diabetes and ambulatory blood pressure on SCIs was determined in 360 asymptomatic patients with hypertension with or without diabetes.

4 The number of SCIs and the prevalence of SCI and multiple SCIs were significantly higher in patients with diabetes and hypertension than in those with hypertension only.

5 The presence of diabetes coexisting with hypertension (both sustained and white-coat) is the most powerful determinant of SCIs.

*Eguchi K, Kario K, Shimada K (2003) Greater impact of coexistence of hypertension and diabetes on silent cerebral infarcts. Stroke **34**: 2471–4*

JOURNAL OF HUMAN HYPERTENSION

Diabetes increases 1-year mortality after MI by 60%

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

1 The sample comprised 4317 consecutive patients with an acute myocardial infarction (MI). The in-hospital, 30-day and 1-year outcome of hypertensive patients with diabetes was compared with that of normotensive patients with diabetes, hypertensive patients without diabetes and normotensive patients without diabetes.

2 The mortality rates of hypertensive patients with diabetes were significantly higher than those of normotensive patients with diabetes and hypertensive patients without diabetes.

3 Diabetes increased the 1-year mortality after MI by about 60%. However, controlled hypertension did not worsen the outcome of patients with diabetes after MI.

*Jonas M, Reicher-Reiss H, Boyko V, Behar S, Grossman E (2003) Hospital and 1-year outcome after acute myocardial infarction in patients with diabetes mellitus and hypertension. Journal of Human Hypertension **17**: 665–70*

ANNALS OF THORACIC SURGERY

Insulin-dependent diabetes worsens post-op outcome

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

1 A prospective follow-up study evaluated the short-term and mid-term outcomes of 200 patients with type 2 diabetes who had coronary artery bypass grafting; 100 were insulin-dependent and 100 were non-insulin dependent.

2 The cumulative number of postoperative complications was 148 for the insulin-dependent group and 69 for patients not on insulin. The mean length of stay in hospital was longer for those on insulin than for those not on insulin.

3 Overall, late cardiac and non-cardiac complication rates were significantly higher for patients on insulin than for those not on insulin.

4 Patients with diabetes on insulin treatment should be considered high-risk candidates for coronary artery bypass grafting and require intense perioperative and long-term monitoring.

*Luciani N, Nasso G, Gaudino M et al (2003) Coronary artery bypass grafting in type 2 diabetic patients: a comparison between insulin-dependent and non-insulin-dependent patients at short- and mid-term follow-up. Annals of Thoracic Surgery **76**: 1149–54*

JOURNAL OF HEART AND LUNG TRANSPLANTATION

Diabetes increases risks after heart transplantation

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

1 The risks of heart transplantation in patients with diabetes were determined by reviewing 101 patients with diabetes and 244 non-diabetic patients who all received donor hearts.

2 Survival, renal function, development of transplant coronary artery disease, severe rejection and infection were analysed.

3 There was a trend towards decreased survival for those with diabetes at 1 year, although 5-year survival was 81.6% for both groups.

4 Infection rate within 3 months was greater among those with diabetes. Freedom from infection at 4 years was 71% for patients with diabetes and 85% for those without. Freedom from rejection at 4 years was similar.

5 At 4 years, transplant coronary artery disease-free survival was 69.5% for patients with diabetes and 81.6% for those without.

6 Mean serum creatinine concentration at 4 years after transplant was 1.5 mg/dl in patients with diabetes. Multivariate analysis showed an increased baseline creatinine level as a significant risk factor for survival, and showed pre-transplant ischaemic cardiomyopathy as a risk factor for transplant coronary artery disease in both groups.

7 There was an increased risk of serious infections in patients with diabetes, particularly in the early postoperative period. Consideration of obesity and renal function during evaluation of candidacy is indicated.

*Marelli D, Laks H, Patel B et al (2003) Heart transplantation in patients with diabetes mellitus in the current era. Journal of Heart and Lung Transplantation **22**: 1091–7*

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