Intensive glycemic control in diabetics reduces microvascular complications

The majority of patients with diabetes mellitus eventually experience disabling or lethal vascular complications. Blood glucose levels and the percentage of glycated hemoglobin (HbA_{1c}) correlate with risk of vascular events, so current guidelines for the management of patients with diabetes recommend a target HbA_{1c} level of ≤7.0%.

Vascular outcomes have been studied in 11,140 patients with type 2 diabetes and a mean HbA_{1c} level of 7.5% at enrollment. These patients were randomly assigned to undergo either standard therapy, which used conventional targets for glycemic control, or an intensive therapeutic regimen that involved modified-release gliclazide (30–120 mg per day) and other drugs as required to achieve ≤6.5% HbA_{1c}. At the end of follow-up (median duration 5 years), the mean HbA_1 level and mean systolic blood pressure were 7.3% and 137.9 mmHg in the standard-therapy group, compared with 6.5% and 135.5 mmHg in the intensive-therapy group, respectively. Compared with standard glycemic control, the intensive strategy was associated with a significantly lower incidence of major microvascular events. However, rates of major macrovascular events, deaths from cardiovascular causes and deaths from any cause were comparable in both groups. Unfortunately, a trend towards more hospitalizations was evident in the intensive-therapy group, partly because severe hypoglycemia occurred significantly more frequently in the intensive-control group than the in the standard-control group.

The authors conclude that an intensive therapeutic regimen for glucose control is important for prevention of microvascular complications in patients with type 2 diabetes.

Original article The ADVANCE Collaborative Group (2008) Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. *N Engl J Med* **358:** 2560–2572

Aspiration of infarct-related arterial thrombi before PCI improves long-term outcomes

Reperfusion of viable myocardium following percutaneous coronary intervention (PCI) is frequently suboptimal—microvascular obstruction can occur following embolization of atherothrombotic material from the culprit lesion into the distal vasculature. Thrombus aspiration can establish antegrade flow before revascularization, and improves various measures of myocardial reperfusion, but whether aspiration is also associated with a survival benefit is not known. The TAPAS study, published recently in the *Lancet*, has now shown preliminary evidence of a long-term clinical benefit for thrombus aspiration before PCI.

Conventional treatment was compared with thrombus aspiration in 1,071 consecutive patients with ST-segment elevation myocardial infarction. Before angioplasty, patients were randomly assigned to undergo either thrombus aspiration with the Export® XT aspiration catheter (Medtronic, Minneapolis, MN; $n=535$) or conventional treatment ($n=536$). At 1 year, significantly fewer deaths from cardiovascular causes had occurred in the aspiration group than in the conventional-therapy group (19 versus 36 patients, or 3.6% versus 6.7%; hazard ratio 1.93, 95% CI 1.11–3.37). The combined end point of cardiac-related death or nonfatal reinfarction occurred in 30 patients (5.6%) treated with aspiration compared with 56 patients (9.9%) who underwent conventional treatment (hazard ratio 1.81, 95% CI 1.16–2.84; $P=0.009$).

Thrombus aspiration before PCI seems to improve clinical outcomes at 1 year; however, further investigation with sufficiently powered studies is needed.

Original article Vlaar PJ *et al.* (2008) Cardiac death and reinfarction after 1 year in the Thombus Aspiration During Percutaneous Coronary Intervention in Acute Myocardial Infarction Study (TAPAS): a 1-year follow-up study. *Lancet* **371:** 1915–1920

Noninvasive ventilation improves symptoms of acute cardiogenic pulmonary edema

Small, single-center trials have shown that noninvasive ventilation benefits patients who do not respond to medical therapy for acute cardiogenic pulmonary edema. Gray and colleagues have now conducted a multicenter, randomized, parallel-group trial that compared standard oxygen therapy with two noninvasive ventilation strategies—continuous positive airway pressure