Cardio DIGEST
The easy way to stay up to date with developments in cardiovascular care

Editorial

Jiten Vora
Editor, Cardio Digest

Cardiovascular risk factors and lifestyle management

A number of prevention programmes have examined the effect of lifestyle management and pharmacological intervention on preventing the progression from impaired glucose tolerance to diabetes. These programmes are based on data showing that impaired glucose tolerance increases the risk of cardiovascular (CV) disease and diabetes. Consequently, programmes in the US (the Diabetes Prevention Program [DPP]) and other countries have clearly demonstrated that diabetes in impaired glucose tolerance can be prevented or delayed by intensive lifestyle management as well as with metformin treatment. The impact of these programmes on CV risk factors and events, however, remains less clear.

The DPP demonstrated that following a mean of 3.2 years of lifestyle intervention, CV risk factors and indeed the incidence of metabolic syndrome were reduced (Diabetes Prevention Program Research Group, 2002). However, the effect of these benefits in changes to the epidemiology of CV events has not yet been established. Furthermore, the impact of improved glycaemia and lifestyle management on CV risk factor levels and events in people with established diabetes also remains unclear. Whilst the United Kingdom Prospective Diabetes Study (UKPDS) with its post-trial monitoring period suggests a reduction in macrovascular events with improved glycaemic control (Holman et al, 2008), other studies do not suggest an impact of improved glycaemic control on macrovascular disease. However, in people with impaired glucose tolerance it would be important to establish whether lifestyle modification, such as in the DPP, results in a sustained improvement in CV risk factors.

> ***"In people with impaired glucose tolerance it would be important to establish whether lifestyle modification, such as in the Diabetes Prevention Program, results in a sustained improvement in CV risk factors."***

In the DPP, the number of CV events was relatively low in both the lifestyle and metformin treatment groups. However, clear evidence was presented for improvement of CV risk factors (Diabetes Prevention Program Research Group, 2002). A recent paper from the DPP Research Group presents a further 5 years of follow-up data to enable assessment of the sustainability of these changes on CV risk (Ratner, 2006).

Further, more recent analysis of the DPP data revealed that after 10 years of follow-up from baseline, significant reductions were noted in both systolic and diastolic blood pressure (BP; 2–3 mmHg and 5–6 mmHg, respectively). Reductions in low-density lipoprotein-cholesterol (0.47–0.54 mmol/L) and triglycerides (0.18–0.32 mmol/L) were also reported. These changes were seen in both the lifestyle- and the metformin-treated groups. In both groups, high-density lipoprotein-cholesterol increased equivocally (0.13 and 0.16 mmol/L). However, the key issue was that lipid and BP medication use was significantly lower in the lifestyle group compared with the metformin group (Orchard et al, 2012).

In conclusion, in people with impaired glucose tolerance, intensive lifestyle intervention reduces the progression to diabetes, as does the use of metformin therapy. In the DPP, both of these treatment groups maintained a reduction in systolic BP as well as beneficial changes to lipid profiles. However, in people with impaired glucose tolerance these changes are attained with lower medication usage in those receiving lifestyle management than in those taking metformin. Whether these changes will reflect a reduction in CV events in such individuals remains to be established.

Diabetes Prevention Program Research Group (2002) Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* **346**: 393–403
Holman RR, Paul SK, Bethel MA et al (2008) Long-term follow-up after tight control of blood pressure in type 2 diabetes. *N Engl J Med* **359**: 1565–76
Orchard TJ, Temprosa M, Barrett-Connor E et al (2012) Long-term effects of Diabetes Prevention Program interventions on cardiovascular risk factors: a report from the DPP Outcomes Study. *Diabet Med* 19 Jul [Epub ahead of print]
Ratner RE, for the Diabetes Prevention Program Research Group (2006) An update on the Diabetes Prevention Program. *Endocr Pract* **12** (Suppl I): 20–24

Jiten Vora is Professor of Diabetes, Royal Liverpool University Hospitals, Liverpool.