How does diabetes affect my patient’s heart?

Beverley Bostock RGN MSc MA QN
ANP Gloucestershire
Diabetes Lead Education for Health
PCCS committee member
Primary Care Cardiovascular Society website
How to register for Membership

Annual Subscription
GPs £40
Pharmacists, GP Registrars and Nurses £20

How to Register
To register for membership please follow this link
http://pccs.lcwmed.co.uk

Or call 01444 414264
Or email registrations@LCWmed.co.uk
Aims

By the end of this session you will be able to

• i) evaluate the impact of diabetes and heart health
• ii) recognise lifestyle interventions which can improve cardiovascular outcomes and
• iii) consider the impact that drug therapies can have on heart health, beyond glycaemic control.
The real cost of diabetes
Excess mortality in Type 2 Diabetes is largely related to Cardiovascular Disease\(^1\)

- Around one third of people with T2D also have CV disease\(^2\)
- CV disease is responsible for approximately half of all deaths in people with T2D\(^2\), with many of these deaths premature\(^3\)
- CV disease can occur 10–15 years earlier in patients with diabetes compared with those without diabetes\(^4,5\)
- Diabetes accelerates the time to the first CV event\(^6\)*

*Time to first myocardial infarction event or first heart failure hospitalisation. CV = cardiovascular; T2D = type 2 diabetes.
What happens?

**Macrovascular disease**
- Transient ischaemic attack
- Stroke
- Angina
- Myocardial infarction
- Cardiac failure

**Microvascular disease**
- Diabetic retinopathy
  - non-proliferative
  - proliferative
  - macular oedema
- Microalbuminuria
- Macroalbuminuria
- End-stage renal disease
- Erectile dysfunction
- Autonomic neuropathy
- Peripheral neuropathy
- Osteomyelitis
- Amputation
Why?
UKPDS: HbA1c lowering and complication risk

11 mmol/mol decrease in HbA1c

- 43% Amputation or fatal peripheral blood vessel disease*
- 37% Microvascular complications e.g. kidney disease and blindness*
- 21% Deaths related to diabetes*
- 14% Heart attack*
- 12% Stroke†

*P<0.0001; †P=0.035.
UKPDS=UK Prospective Diabetes Study.
Lifestyle – underpins all
Clinical practice in the UK: NICE Guideline 28 does not currently include Cardiovascular Outcome Trial Data

NG28: review due (new guidance TBC)

NG28 published

NG28 updated

Dec 2015

May 2017

2020

BMI = body mass index; DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1 = glucagon-like peptide-1; SGLT2i = sodium-glucose co-transporter-2 inhibitor; SU = sulphonylurea.


NICE guidance is prepared for the National Health Service in England and is subject to regular review and may be updated or withdrawn.

NICE has not checked the use of its content in this module to confirm that it accurately reflects the NICE publication from which it is taken.
The 2018 Easd/Ada consensus report has incorporated Cardiovascular Outcome Trial Data
What about this?
Figure 1: The Bi-directional Impact of Diabetes Mellitus and Heart Failure

**Diabetes Mellitus**
- Altered FFA metabolism
- Impaired myocyte $Ca^{2+}$ sensitivity
- Microvascular dysfunction
- Neurohormonal abnormalities (RAAS)
- Cardiac autonomic dysfunction
- Hyperglycaemic cellular damage

Impaired LV contractile function
- Relaxation abnormalities
- Fibrosis
- LVH
- Myocyte necrosis
- Endothelial dysfunction
- Altered myocyte metabolism

Heart failure

Hyperglycaemia
- Insuline resistance

Cardiomyopathy

FFA = free fatty acids; Ca$^{2+}$ = Calcium; RAAS = Renin-angiotensin aldosterone system; LVH = Left ventricular hypertrophy.
Newer glycaemic agents – the great HOPE?

- SGLT2 inhibitors:
  - Lower plasma glucose & HbA1c
  - Induce moderate natriuresis
  - Reduce blood pressure
  - Reduce weight
  - Exert cardio-protective properties on the heart

- GLP1- RAs & CVD
Medication

• Triple whammy:
  • Glycaemic control
  • BP
  • Lipids
In summary

• Diabetes impacts on vascular and heart health
• Cost is financial and in terms of quality of life/years of life lost
• Both lifestyle interventions and drug therapies can improve heart health, beyond glycaemic control, in those with established disease and those who are at increased risk
• b.bostock@educationforhealth.org
Conclusion

• The management of CVD in diabetes remains a major priority

• We need to individualise treatment choices in CVD & with diabetes

• Individuals with diabetes and CVD may benefit most from SGLT2 inhibitors or certain GLP1 receptor agonists

• Individuals with diabetes and HF and/or CKD may benefit most from SGLT2 inhibitors

• Emerging evidence of SGLT2i beneficial in patients with heart failure without diabetes

• Guidelines are changing – most recently SIGN 2017 & ADA/EASD October 2018

• Watch this space!
  • DAPA-CKD, EMPA-KIDNEY, EMPEROR-Reduced, EMPEROR-Preserved, PRESERVED-HF