Module C

4 - Cardiovascular disease

Learning Aims

To understanding the link between cardiovascular disease (CVD) and diabetes

To have an awareness of the risk factors for CVD

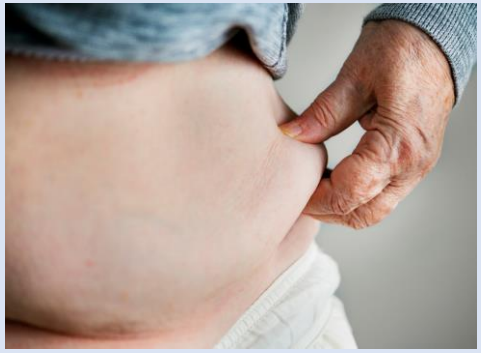
To understand how cardiovascular health can be improved in older adults with diabetes living in care homes

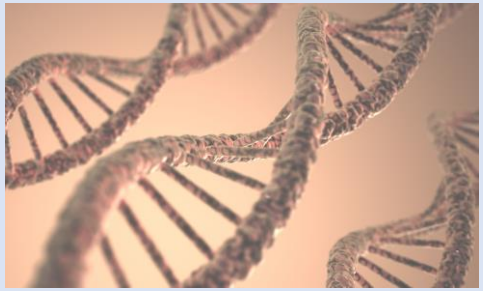
Introduction

- Cardiovascular disease (CVD) describes a group of conditions involving the heart and blood vessels
- It is one of the most prevalent causes of mortality and morbidity in people with diabetes
- Men and women with diabetes have at least a 2-fold increase in risk of developing CVD
- About two thirds of people with diabetes will die from heart disease or stroke

Risk factors

- Diabetes and CVD share many risk factors hence why they often go hand in hand:
  - Obesity
  - Physical inactivity
  - Genetics
  - Smoking
  - Hypertension
  - Dyslipidaemia

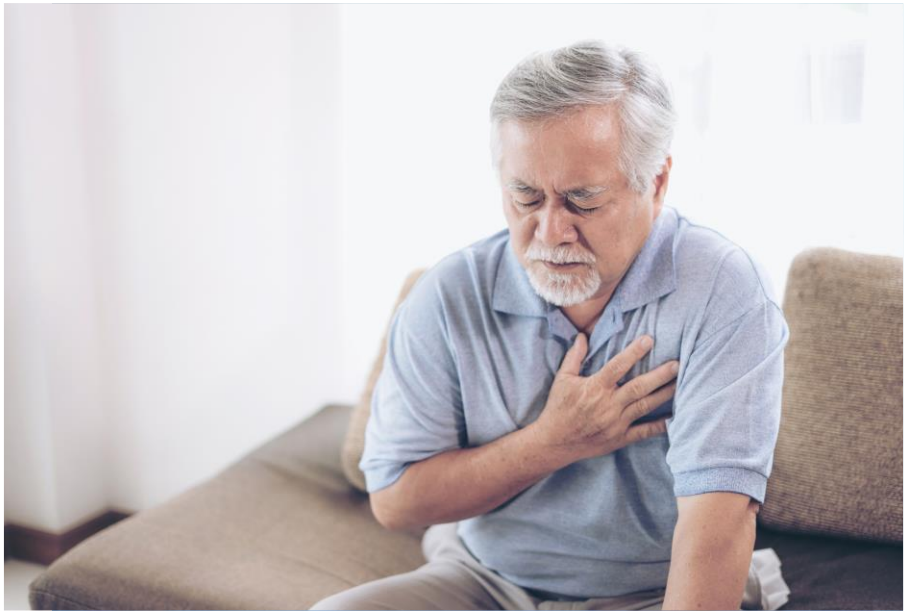




- These can be split into modifiable and unmodifiable risk factors

What mechanisms are involved in diabetes-related heart disease?

- Coronary artery disease is caused by **atherosclerosis** which consists of a build up of cholesterol in the blood vessels which supply oxygen and nutrition to the heart
- Cholesterol plaques can fragment or rupture and can become sealed by platelets which can interrupt the flow of blood - **thrombosis**
- Severe atherosclerosis and a thrombosis in a coronary artery can lead to a heart attack (**myocardial infarction**) which can be fatal
- Symptoms of a heart attack include chest pain and pain in the jaw or shoulders or left arm, nausea, shortness of breath, feeling faint or dizzy, or excessive sweating



Congestive heart failure – a serious heart condition

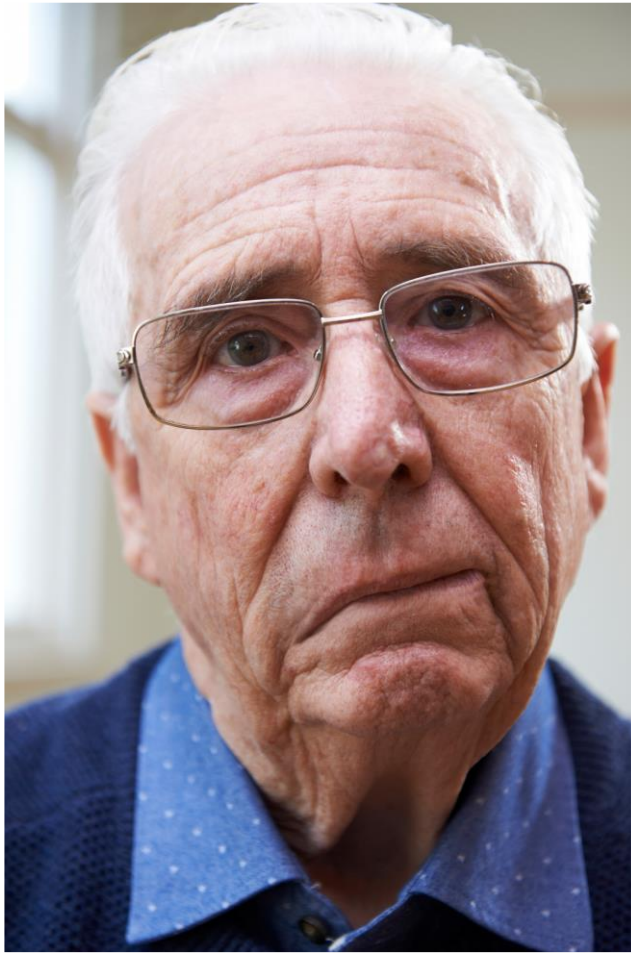
- The presence of cardiovascular disease can result in the heart becoming less effective at pumping blood around the body
- Right sided heart failure will result in ineffective pumping to the lungs
  - This means fluid accumulates in the body, often the arms and legs.
- Left sided failure will result in ineffective pumping to the rest of the body
  - This means fluid accumulates in the lungs
- Symptoms include: breathlessness, pallor, oedema, persistent cough and dizziness

Congestive heart failure

- An important epidemiological study, the **Framingham Heart Study**, suggests that diabetes mellitus independently increases the risk of heart failure up to 2-fold in men and 5-fold in women compared with age-matched controls
- In one study, nearly half of all people admitted into hospital for heart failure had diabetes
- Studies suggest that good glucose control might not necessarily improve the outcomes from heart failure
- Diabetes drugs that appear relatively safe and might improve the outcomes of those with heart failure include metformin and SGLT-2 inhibitors
- However, others such as sulfonylureas (SUs), thiazolidinediones (TZDs), insulin, and some DPP4i (dipeptidyl peptidase 4 inhibitors) might exacerbate or increase the risk for HF.
- The addition of a GLP-1 RA with established cardiovascular benefit can also be considered

Stroke – Cerebrovascular Disease

- People with diabetes are at least 1.5 times more likely to have a stroke than someone without diabetes
- A stroke occurs when the blood flow in one of the cerebral blood vessels to an area of the brain is disturbed or blocked resulting in some degree of neurological damage.
- The two major categories of stroke are **ischaemic** (lack of blood and hence oxygen to an area of the brain) and **haemorrhagic** (bleeding from a burst or leaking blood vessel in the brain) stroke
- The development of a stroke is a medical emergency and requires immediate ambulance call out and hospitalisation
- Key symptoms are: facial drooping, weakness of the arm and/or leg, slurred speech, sudden onset of dizziness or confusion, visual loss, or severe headache



Transient ischaemic attack - TIA

- A person may have many or all of the features of a stroke but recovery takes place within 24 hours – this is sometimes called a **mini-stroke or TIA** (transient ischaemic attack)
- The occurrence of a **TIA** should be taken seriously and the GP will want to check important risk factors such as diabetes control, blood pressure, and may prescribe a type of tablet called antiplatelet therapy
- **Risk factors** for stroke illness apart from diabetes are many and include: advanced age, atrial fibrillation, hypertension, previous history of cardiovascular disease or stroke, smoking, excessive alcohol use, coagulation disorders, etc.

Peripheral Arterial Disease (PAD)

- The blood vessels of the legs can become atherosclerotic with plaque build up and inflammation
- This restricts blood flow to the legs
- Symptoms include:
  - Pain (experienced by 30%)
  - Hair loss on legs and feet
  - Numbness or weakness in legs
  - Brittle, slow-growing nails
  - Shiny skin
  - Skin discolouration
  - Muscle wasting

Key Principles of Management

- Attention should be focused on addressing modifiable risk factors such as diet and physical activity
- Satisfactory glucose control and blood pressure control is important
- Losing weight (if clinically appropriate) has been shown to decrease CVD risk
  - However it may also encourage sarcopenia and frailty
  - Weight loss should be guided by qualified dieticians
- Provisions for engaging in light exercise and resistance training classes should be attempted within care homes

Key messages

KM

Residents with diabetes living in care homes are likely to be at high cardiovascular risk

KM

Attention to modifiable risk factors of CVD within the context of the care home population is important, with an emphasis on optimum weight, healthy diet and light exercise programmes.

KM

Early detection of vascular signs and symptoms may allow worthwhile intervention to reduce the impact of the disease on an individual resident.

Questions

Q1. Which of the following are modifiable risk factors for cardiovascular disease?

- A. Smoking
- B. Genetics
- C. Social Economic Status
- D. Diet
- E. Gender

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- **A. Smoking**
- B. Genetics
- C. Social Economic Status
- **D. Diet**
- E. Gender

Questions

Q2. Which vascular condition is asymptomatic in about 70% of older adults?

- A. Left heart failure
- B. Stroke
- C. Peripheral arterial disease
- D. Right heart failure

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Q3. The two major types of a stroke are:

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Q4. which of the following represent key principles in managing cardiovascular disease:

- A. Addressing non-modiafiable risk factors
- B. Controlling blood pressure
- C. Prevention of falls
- D. Maintaining satisfactory blood glucose control

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- **B. Controlling blood pressure**
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Further reading and references

- IDF Global Guideline for Managing Older People with Type 2 Diabetes (2013). Available at: https://www.idf.org/e-library/guidelines/78-global-guideline-for-managing-older-peoplewith-type-2-diabetes.html
- Sinclair AJ, Dunning T, Mañas LR, Munshi MN (eds). Diabetes in Old Age (2017). John Wiley & Sons, Chichester, UK:
- Prelipcean MS (2019). Stroke: Diabetes and other risk factors. Available at: https://www.healthline.com/health/diabetes/diabetes-and-stroke#risk-factors

Learning completed