Chronic heart failure affects more than 10 per cent of those over the age of 80 and is a major cause of sudden death. The first article in this month’s special feature reviews the epidemiology, pathophysiology, clinical features, investigation and prognosis of the disease.

**Epidemiology**

Life expectancy of chronic heart failure patients is significantly reduced making the disease a major challenge to the health service. The majority of individuals developing heart failure are aged over 70 years and the most common cause is coronary artery disease and hypertension. The prevalence of chronic heart failure increases steeply with age from 1–2 per cent in 50–60 year olds to over 10 per cent in those aged 80 years and over. There is a poor prognosis with 30 per cent mortality within one year, increasing to 60–70 per cent mortality after five years.

The Framingham Heart Study showed that 50 per cent of all deaths were sudden. It was also shown that the age adjusted annual incidence of chronic heart failure was 0.14 per cent in women and 0.23 per cent in men, with better survival rates in women than men.

In the UK General Practice Morbidity Survey, the prevalence of chronic heart failure increased from 0.1 per 1,000 population in those aged 25–44 years, to 140.3 per 1,000 in those aged 85 years. However, these data may lack accuracy because the diagnosis was not made in specialist centres.

**Pathophysiology**

Chronic heart failure may occur as a result of damage to the coronary artery, valve disease, hypertension, alcohol misuse or viral infections. It is considered to be a neurohormonal imbalance. Chronic activation of neurohormonal pathways such as the...
Neurohormonal activation

Neurohormonal mechanisms are activated so that they compensate for myocardial cell dysfunction to normalise output and function. The sympathetic nervous system is activated in response to an increase in pre-load. This will work to increase both the force and frequency of contraction. This activation of the sympathetic nervous system occurs early in the disease process leading to the stimulation of the renin-angiotensin system as the disease progresses and symptoms develop. In addition, locally active vasoconstricting factors such as endothelin are released.

Neurohormonal activation leads to sodium and water retention. Prolonged activation of the sympathetic nervous system and renin-angiotensin system exert adverse effects on the heart independent of their haemodynamic action.

Clinical features

Patients with chronic heart failure pass through a phase of asymptomatic left ventricular dysfunction to develop exercise intolerance, shortness of breath, fatigue, oedema, ascites and ultimately skeletal muscle wasting. Chronic heart failure is a clinical syndrome with identifiable causes, with the heart usually enlarged and becoming more spherical over time.

Chronic heart failure is a condition reflected in symptoms and signs by the effects of low cardiac output with retention of sodium and water. The degree of limitation is graded by the NYHA system as has previously been discussed.

Dyspnoea

Breathlessness is the most common complaint of a pre-load problem. This symptom may be worse at night when lying flat (orthopnoea) and can sometimes wake the patient. Paroxysmal nocturnal dyspnoea reflects nocturnal absorption of fluid during sleep and can lead to gasping, coughing and wheezing.

Fatigue and lethargy

This is related to abnormalities in skeletal muscle with impaired muscle blood flow. Reduced cerebral blood flow, accompanied by abnormal sleep patterns, may lead to insomnia and confusion in severe chronic heart failure.

Oedema

Swollen ankles are what patients most often complain of and this symptom is worse at the end of the day. Older people often do not mention the oedema until it is severe, even above the knees. An increase in weight may be associated with fluid retention.

Investigations

A summary of the NICE guidance on the diagnosis of heart failure is presented in Figure 1 (p90).

Chest X-ray

The chest X-ray is a routine examination in patients with suspected heart failure and can also be used when monitoring the response to treatment. Cardiomegaly (enlarged heart) may be seen, but this is dependent on the severity and duration of haemodynamic disturbance and...
Figure 1: Algorithm summarising recommendations for the diagnosis of heart failure. * Alternative methods of imaging the heart should be considered when a poor image is produced by transthoracic doppler 2D-echocardiography — alternatives include transoesophageal echocardiography, radionuclide imaging or cardiac magnetic resonance imaging. BNP=B-type natriuretic peptide; ECG=electrocardiogram; FBC=full blood count; LFTs=liver function tests; NTproBNP=N-terminal pro-B-type natriuretic peptide; TFTs=thyroid function tests; U&Es=Urea & electrolytes. (Reproduced by permission of the Royal College of Physicians)
uptake (VO2 max) during progressive exercise to exhaustion.

---

**PROGNOSIS**

Determining the prognosis for patients with chronic heart failure is extremely important because both patients and their relatives usually want to know so that they can plan their lives. Additionally, understanding the prognosis can help with plans for transplantation and long-term management. Prognostic factors predicting worsening of survival may include: ischaemic aetiology, long disease duration, clinical instability, history of syncope, high NYHA class, abnormal heart rate recovery and inability to walk short distances.

Sudden death often occurs unexpectedly in seemingly stable patients. The ability to predict high-risk patients remains, therefore, poor.

---

**SUMMARY**

Patients with chronic heart failure are part of a growing group. Chronic heart failure morbidity and mortality are increasing. However, therapy is improving and the development of innovative technological and pharmacological interventions is continuing.

**REFERENCES**


**Chronic heart failure national guidelines**

The full version of “Chronic heart failure — national clinical guideline for diagnosis and management in primary and secondary care” is available from the publications department at the Royal College of Physicians (www.rcplondon.ac.uk) Price UK £25.00; overseas £28.00 (ISBN 1 86016 188X)