The Hearing Aid Podcasts

Episode 6.07 Show Notes
Heart Failure

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Learning Outcomes

Knowledge:

- Defining heart failure and an appreciation of the common aetiologies
- NYHA classification with respect to assessment of symptoms
- Understanding the medical and non-pharmacological therapies for heart failure and appreciating when device therapies may be warranted
- An awareness of conditions that may mimic heart failure
- Complexities of managing HF in older multimorbid patients

Skills:

- Identify heart failure symptoms
- Interpreting N-terminal pro-B-type natriuretic peptide (NT pro-BNP) results
- Identifying which patients require urgent referral to hospital

Attitudes:

- The importance of comorbidities and to create individualised care plans, including patient education
- Appreciating the role of the multi-disciplinary team in the management of heart failure
- Recognising how heart failure may impact the quality of life of a patient
- Appreciating the psychological impact of heart failure on patients
- Respecting patient choice regarding prognostic therapies

Definitions:

Clinical: Heart failure is a complex clinical syndrome that arises from structural or functional impairment of ventricular filling or ejection of blood. The principle clinical manifestations are dyspnoea and fatigue, which may restrict exercise tolerance, and fluid retention, which may result in pulmonary and/or peripheral oedema. As some patients are asymptomatic and without fluid overload on presentation, the term "heart failure" is used in preference to "congestive heart failure."

ESC heart failure guidelines (2016); ACCF/AHA heart failure guidelines (2013)

Echocardiographic:

Echo allows evaluation of the function of the heart. In particular the Left Ventricular Ejection Fraction i.e. how much blood the LV manages to pump out with each beat. Normal contraction is defined as >60% of the volume of blood in the ventricle.

- Heart Failure with reduced ejection fraction = <40%
- HF with mid range EF = 40-49%
- HF with preserved EF = ≥50%

This needs is put together with the clinical picture. E.g. someone with a clinical diagnosis of heart failure and a normal EF would have a diagnosis of HF with preserved ejection fraction (often called diastolic heart failure). i.e. the echo is normal but the clinical scenario is not.

ESC heart failure guidelines (2016)

Functional classification:

The NYHA classification grades the severity of functional impairment experienced

I No limitation of physical activity.
II Slight limitation of physical activity.
III Marked limitation of physical activity.
IV Unable to carry on any physical activity with symptoms at rest.

Key Points from Discussion

To explore this further we are going to use the case of Joyce

Joyce is an 76 year old lady who lives alone in a 3rd floor flat. She presented to her GP 4 weeks ago with difficulty with climbing the stairs (there is no lift), which she can normally do independently. She has been increasingly breathless on climbing the stairs and feeling tired all day, even once her breathing recovers. Her GP treated her for a chest infection but with no improvement in her symptoms. Over the last 2 weeks she has noticed that her ankles have become swollen which she puts down to not walking around so much.

She has a background history of Type 2 Diabetes for 15 years, mild chronic kidney disease, atrial fibrillation, high blood pressure and OA of knees and hands in particular. She had an episode of quite severe depression following in the 1990s following the death of her husband but recovered well.

Presentation discussion

Age: Heart failure is common in older adults

- Prevalence of heart failure is 1-2% of the general population rising to 10% over 70 years.
- Over 80% of all heart failure patients are 65 years and older.
- Heart failure with preserved ejection fraction (HFpEF) is the most common form of heart failure (HF) in older adults, particularly women, and is increasing in prevalence as the population ages.

Symptoms & signs:

- Shortness of breath, fatigue on exertion, peripheral oedema, orthopnoea
- Fluid retention on examination e.g raised JVP (vein in the neck) and swollen legs (note differential diagnosis for swollen legs is broad - episode on red legs, swollen legs in series 5.03).
- Note poor correlation between symptom severity and prognosis.
- Alleviated quickly with diuretic therapy.

Diagnosis

1) ECG: for signs of previous heart attacks or rhythm disturbances.
2) Bloods: NT pro-BNP - risk stratify.
    a) If level >2000: refer for echo within 2 weeks
    b) If level 400-2000: refer for echo within 6 weeks
    c) If level <400: heart failure is unlikely
3) Chest x-ray: not strictly part of diagnosing heart failure (signs of fluid overload and a large heart may be seen) but part of looking for alternative diagnoses causing breathlessness.
4) Echocardiogram: if history of MI then echo within 2 weeks
    a) Echo looks at function of the heart using ultrasound and doppler.

If BNP and echo are both normal, an alternative diagnosis should be sought.

BNP is falsely low in: obesity, medication use (standard diuretics, ACE inhibitors, ARBs and beta blockers).

BNP is falsely raised in

1) Cardiac conditions: heart attack, pericardial disease, AF, tachycardia, myocarditis, LVH (large left ventricle)
2) Non-cardiac conditions: advancing age, anaemia, renal impairment, PE, OSA, COPD, T2DM

Joyce's GP arranged an ECG which showed AF only and no signs of a previous heart attack or ischaemic heart disease so went on to do a BNP which was elevated at 5000. On the basis of this she was referred for an echo within 2 weeks which showed an ejection fraction of 40%. CXR was normal.

Based on echo findings Joyce has HF with reduced ejection fraction and commenced on medications to treat this, namely a low dose beta-blocker, an ACE-inhibitor and furosemide and referred to the heart failure nurse for ongoing support with management including monitoring of blood tests.

Discussion on difference in treatment of HF with reduced EF vs preserved.

Before heading into the pharmacological management of HF it is noteworthy to appreciate that most landmark HF trials included younger patients (<65 years). However there has been some attempt to partially address this with the following studies (age≥73):

Randomized trial to determine the effect of nebivolol on mortality and cardiovascular hospital admission in elderly patients with heart failure (SENIORS). Flather et al, European heart journal Flather et. al 2005

I-PRESERVE Irbesartan in patients with heart failure and preserved ejection fraction. New England Journal of Medicine, Massie et al 2008.

Titration to target dose of bisoprolol vs. carvedilol in elderly patients with heart failure: the CIBIS-ELD trial. European journal of heart failure, Düngen et al 2011.

Randomised trial of losartan versus captopril in patients over 65 with heart failure (Evaluation of Losartan in the Elderly Study, ELITE). The Lancet, Pitt et al 1997.

The perindopril in elderly people with chronic heart failure (PEP-CHF) study. European heart journal, Cleland et al 2006.

Nonetheless the fact remains that current evidence-based therapies have been examined in populations which may represent the minority of those patients likely to receive treatment.

The general principle for the treatment of heart failure in older adults is similar to that in younger adults and can generally be divided into symptom-relieving treatment and disease-modifying or life-prolonging treatment.

Symptom-relieving therapy for heart failure is similar for both systolic and diastolic heart failure. Essentially this is diuretic therapy such as furosemide and bumetanide.

Disease modifying treatment includes groups of medications e.g. ACEi, beta-blockers and aldosterone blockers which can improve heart function, symptoms and reduce mortality.

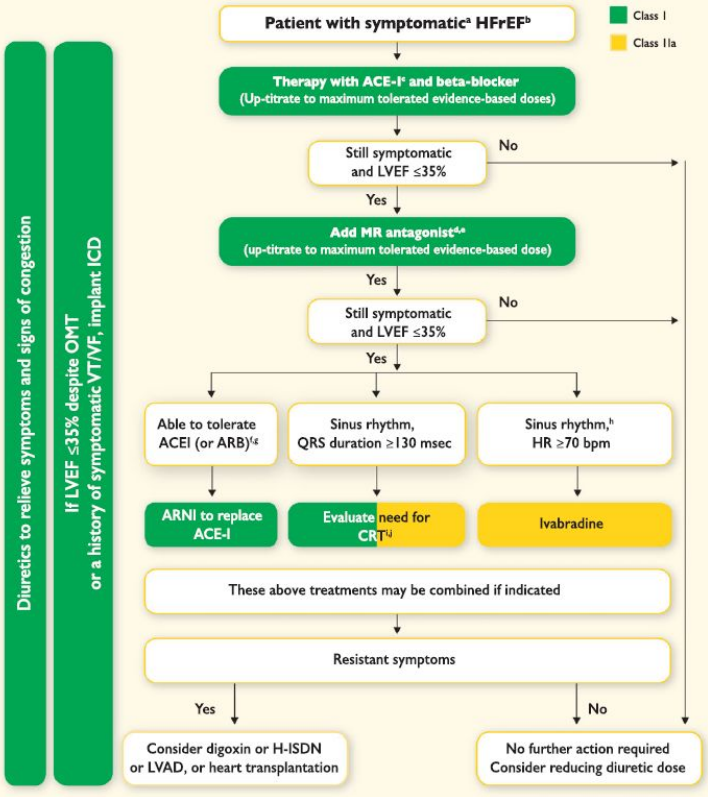
However, because evidence for disease-modifying therapy is primarily derived from younger systolic heart failure, there is little evidence to guide therapy for elderly diastolic HF patients.

It is the reversal of cardiac-remodeling which facilitates their prognostic benefits.

Cardiac-remodeling is defined as a group of molecular, cellular and interstitial changes that manifest clinically as changes in size, mass, geometry and function of the heart after injury. The process results in poor prognosis because of its association with ventricular dysfunction and malignant arrhythmias

So, all older adults with HF with preserved EF should be treated with an ACE inhibitor or an ARB unless they are intolerant. Chronic renal insufficiency is common in HF, and should not be a reason for non-use of these drugs. There is limited evidence for therapy in diastolic heart failure patients.

"Start low and go slow". Refer to the START/STOPP toolkit if in doubt.



From ESC guidance 2016

Heart failure (HF) with preserved ejection fraction (HFpEF) is nearly exclusively found in older persons, particularly older women, in whom 90% of new HF cases are HFpEF. They are more likely to have AF, valvular heart disease, high blood pressure, CKD and COPD than those with HF with reduced ejection fraction. So it would be reasonable to have thought Joyce might have this.

Management of Heart Failure With Preserved Ejection Fraction. Am J Cardiovasc Drugs, Upadhya & Kitzman 2017.

Predictors of congestive heart failure in the elderly: the Cardiovascular study. J. Am Coll Cardiol, Gottdiener et. al 2000

Diastolic dysfunction is a precursor to HF with preserved ejection fraction - this means a stiffer ventricle which is unable to fill as efficiently and therefore unable to maintain requirements in times of high demand e.g. sepsis.

The prevalence of HFpEF is rising, with morbidity, mortality, and healthcare costs now equal to HF with reduced ejection fraction (HFrEF). Its pathophysiology is poorly understood, and no medication trials have had positive effect on their primary endpoints. Consequently, there are no class A guideline recommendations for improving clinical outcomes in patients with HFpEF. Having said this, recently beta-blockers have been shown to reduce all-cause and cardiovascular mortality. However more studies are required to confirm this finding. The same meta-analysis demonstrated MRAs being the only medical therapy to reduce HF hospitalisations.

Zheng, Chan & Nabeebaccus et al. Drug treatment effects on outcomes in heart failure with preserved ejection fraction: a systematic review and meta-analysis. Heart 2018

Role of heart failure nurse

As older adults can differ in their tolerance and response to these medications, they can benefit well with input from a heart failure nurse specialist. They are particularly well placed to optimise and monitor treatment, including clinical assessment and monitoring blood tests e.g. renal dysfunction. Provide continuity of care and therefore help patient through education and care planning. Often well placed to coordinate and support the wider team as well e.g. GP and general community teams and to identify any emerging social and psychological consequences.

Two months later, Joyce is on 3 new medications on top of her 2 for diabetes and DOAC for AF. She has started to feel overwhelmed with the new diagnosis and number of medications and changing doses. She is no longer taking her painkillers for her OA as she was worried about taking so many medications and how they might all interact. She now rarely leaves the house. Her GP expresses concern to her heart failure nurse that she is worried about a relapse of her previous depression as she presented similarly then.

Pharmacists are well placed to help in this situation to help Joyce feel that she can regain control and support adherence with medications.

- Multiple medications with multiple conditions in particular renal and liver dysfunction
- Some may be able to prescribe (esp if specialised in HF but not many around)
- Arrange large writing on medication pack with visual explanation of medications
- Education with Joyce re both medications and non-medical management, flu vaccinations etc.

Heart failure nurse suggests using the 'Trigger tool for self-management' to promote self management and sense of control.

<u>Mood</u>

About 1 in 3 patients with heart failure will have depression or anxiety and a lot more will experience subclinical emotional distress due to the adjustment difficulties and losses in health, control, confidence, independence and even relationships related to heart failure.

These comorbid mental health conditions independently predict cardiovascular morbidity and mortality. When heart failure patients also have depression, they are 2-3 times more likely to have emergency admissions and 8 times more likely to die within 30 months. They also have a poorer quality of life, functioning, and worse health outcomes. These can be explained by both direct physiological mechanisms linking depression/anxiety and heart failure symptoms but also, people with depression and anxiety may have less motivation and ability to adhere to treatment - such as taking their medications as prescribed and following through with rehab.

The integration of psychosocial care into the heart failure team includes

1) providing direct clinical care to complex patients with comorbid heart failure and mental health condition (which includes talking therapy, psychotropic medications and support for social problems such as housing and benefits),

2) education and training to the HF team on managing common emotional and behavioral challenges in HF patients, and lastly,

3) developing a routine system of mental health screening and referral.

Bringing together physical and mental health - a new frontier for integrated care. King's Fund report, Naylor, C. et al (2016).

Following these interventions, Joyce is diagnosed with depression and has both a course of counselling alongside antidepressant medication. A decision is made, now that she has had two such episodes for her to remain on this longer term.

Anti-depressants of choice would be SSRIs or Mirtazapine. Tricyclics avoided where possible due to risk of arrhythmia.

Joyce is stable for many years but several years later, she begins to fall and is referred to the local falls prevention service for physiotherapy and Geriatrician review. The referral letter reads: 'Please could you review this 84 year old lady who has had a diagnosis of heart failure but been stable for some time. Over the last six months she has been admitted with 4 heart failure exacerbations. She is now breathless on walking around her flat. Of late she has begun to fall, has a postural drop in her blood pressure. She has had carers since a couple of attendances to the acute medical unit for one of the falls where she was found to have a low sodium and her weight is falling. She is mildly anaemic and her renal function is worsening. The carers have noticed that she cannot always remember if she has had her medication or not. She is keen to not be admitted to hospital or to have any further invasive tests'.

Role of CGA in heart failure: help to manage the expectations of the patients, set realistic goals, frank discussions around health care goals, management plans, values, priorities, advanced care planning and future interventions.

Postural hypotension + polypharmacy

- Review medication providing benefit and balance against prognosis.
- 20% of patients >70 with HF are prescribed at least 10 meds.
- Approaching 100% risk of adverse drug events in those taking more than 7 meds.
- Almost 50% of admissions related to adverse drug events are attributable to cardiovascular medications (particularly diuretics, warfarin, beta-blockers, and angiotensin-converting enzyme inhibitors)

Joyce is starting to struggle with her medications so may do better with a blister pack and prompting of medications as part of her care plan.

Anaemia

Anaemia can occur as part of a chronic disease process, rather than through GI losses. Oral iron can be poorly tolerated and poorly absorbed. Iv iron is a useful adjunct. Breathlessness from anaemia can exacerbate symptoms of heart failure. This can also reduce the tablet burden but does require attendance as an outpatient for the infusion roughly 3 monthly.

Hyponatraemia

May be due to fluid overload or medication induced. Poor prognostic marker.

Frailty

The frailty syndrome is characterized by an increased vulnerability to physiologic stress. There is a strong relationship between frailty and heart failure and both syndromes share pathophysiologies. The salient features of weakness, skeletal muscle wasting (sarcopenia) and exercise intolerance are also present in HF. Invariably most HF patients are by definition, frail.

Heart failure exacerbations and hospitalizations likely also accelerate the cycle of frailty through deconditioning. Multidisciplinary interventions such as strength and balance training, physical rehabilitation, and nutritional supplementation may improve functional impairment and deficits.

There is an unmet need for a single validated tool capable of defining frailty in the advanced HF population

Collaborative cardiogeriatric clinics have started. The goal of these clinics is to provide integrated care and education for older patients and their caregivers, with the objective of improving quality of life and function. These clinics are also designed to build educational capacity for medical trainees and provide an ongoing research environment.

Prognosis and ACP

Predicting the end of life in heart failure is very challenging, as it is often the case that patients with heart failure will have periods of significant ill health but can recover. Many palliative care referrals in heart failure patients are made in the last few days of life for this reason. The trajectory for heart failure patients can be unpredictable.

However, there are criteria which can indicate that advanced care planning and palliative care involvement. Advanced care planning discussions should be considered in the heart failure patient if the following issues are present (relate to Joyce - she has all):

- 3 or more non elective admissions in last 6 months
- NYHA III-IV
- Refractory symptoms / oedema despite optimal therapies
- Starting to reduce pharmacological therapies
- Resistant hyponatraemia
- Hypo-albuminaemia
- Cachexia
- Declining renal function

Many of these indicate that Joyce is becoming frailer and her heart failure is progressing. The focus should be on helping her to optimise not just her heart function but on future planning for exacerbations and preferences for end of life.

As in ACP episode: trajectory in organ failure and frailty can be unpredictable. Understanding Joyce's wishes before a potential deterioration physically or cognitively is paramount so that she can be supported to achieve this.

Frequent admissions to hospital with decompensation with deterioration in NYHA functional class despite optimum medical therapies are poor prognostic signs. Where advanced heart failure therapies are ruled out consideration should be given to advanced care planning.

Increasingly palliative care teams and hospices are involved in the end of life care of those with heart failure and can provide a valuable alternative to hospital admission for both symptom control and end of life care. They can work alongside heart failure nurses and transition between the two teams.

Joyce has many of her medications stopped or reduced to favour a good standing blood pressure to reduce her falls risk. Priority is given to diuretic therapy as symptom control over disease modifying treatment. She expresses a wish to not return to hospital again in the future, understanding that an exacerbation may be more optimally treated in that environment. She is referred to the local palliative care team by her heart failure CNS for home management with a backup of hospice admission if required.

The Gallery

If you have something you would like us to include - a poem, passage from a book etc then please let us know via Twitter etc etc.

Curriculum Mapping

This episode covers the following areas (n.b not all areas are covered in detail in this single episode):

Curriculum	Area
Higher specialist training geriatric medicine	3.2.3 Presentations of Other Illnesses in Older Persons 3.2.4 Drug Therapy - heart failure 28. Diagnosis and Management of Acute Illness - heart failure 43. Palliative Care - heart failure
NHS Knowledge Skills Framework	Suitable to support staff at the following levels: ● Personal and People Development: Levels 1-3 ● Service Improvement: Level 1 - 2 ● Communication: Levels 3-4
Foundation curriculum	Section 11. Obtains history, performs clinical examination, formulates differential diagnosis and management plan. Section 10. Recognises,assesses and manages patients with long term conditions - Support for patients with long term conditions Section 13 - Prescribes Safely -Clinically effective prescription - Heart failure

Core Medical Training	History taking Patient as central focus of care Cardiology
PA matrix of conditions	1b Cardiac - Heart failure
GPVTS program	3.12 Cardiovascular Health
ANP (Draws from KSF)	Section 7.6 - Heart Failure Section 7.15 - Chronic and Exacerbation of Chronic Conditions. - heart failure
Geriatric Medicine Training Curriculum	1. History Taking: recognise importance of verbal and non-verbal communication from patients and carers. 6. Patient as the Central Focus of Care 11. Managing Long Term Conditions and Promoting Patient Self Care 12. Relationships with Patients and Communication within a Consultation. 42. Psychiatry of Old Age

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