Focus on how best to carry out a medication review of heart failure

In the second article of our special cardiovascular section Jyoti Sood explains how best to carry out a medication review of a patient who has heart failure.

Introduction

The aim of this article is to look at questions that should be asked when reviewing the management of medications prescribed for heart failure (HF).

HF is a complex syndrome that can be caused by any structural or functional cardiac disorder that impairs the ability of the heart to function as a pump in supporting physiological circulation. Symptoms include breathlessness, fatigue and fluid retention. HF causes significant morbidity and mortality — much of which can be prevented or delayed by appropriate management. HF has a poor prognosis and is estimated to cost the NHS £716 million each year.[1,2]

The medical management of HF should already have identified its stage, degree of severity and any related co-morbidities. At the medication review the following treatment objectives should be addressed:

- ☐ to reach an agreement with the patient on the ongoing management plan
- ☐ to reduce symptoms such as shortness of breath and ankle oedema
- ☐ to improve quality of life, for example to achieve increased exercise tolerance
- ☐ to reduce mortality.

Considerations around diagnosis

At a medication review evidence should be sought from the clinical record that a diagnosis of HF was made, and its stage and severity. Also, evidence of management of any associated co-morbidities or concomitant diseases that could exacerbate HF, such as thyroid dysfunction and anaemia, should be identified. A check should be made that where applicable the doses of angiotensin converting enzyme inhibitors (ACEI's) and beta-blockers (BBs) have been titrated slowly.

Consideration should also be given to whether the symptoms are controlled or whether they are worsening. Questions should initially be asked to detect any worsening in control — such as breathlessness, fatigue, ankle swelling and weight gain.

Reviewing HF medications

Treatment of HF is centred on the use of BBs, ACEIs and diuretics. They can carry a risk of harm to the patient if not titrated or monitored closely. It is important in the medication review to minimise the further worsening of HF, to ensure adequate monitoring is in place (particularly of electrolytes), to ensure the patient is adherent and to anticipate any clinically significant drug interactions. Some important interactions with drugs used in HF include:[3]

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- ☐ Non-steroidal anti-inflammatory drugs (NSAIDs) — concurrent use with diuretics, ACEIs and angiotensin-II antagonists (A2RAs) antagonises their hypotensive effect and increases the risk of renal impairment.
- ☐ ACEI's and potassium-sparing diuretics or aldosterone antagonists — concurrent use increases the risk of severe hyperkalaemia.
- ☐ BB's and antiarrthymics — concurrent use increases the risk of myocardial depression and bradycardia, especially with sotalol.
- ☐ BBs or ACEIs and antipsychotics — concurrent use increases the risk of hypotension and ventricular arrthymias especially if hypokalaemic.
- ☐ Antidepressants — St Johns Wort (SJW) is to be avoided in patients receiving digoxin and warfarin because of the risks of toxicity. Concurrent use of sotalol and tricyclic antidepressants increases the risk of ventricular arrthymias.

Diuretics — loop and thiazide[3]

The recommendations are:

- ☐ Therapy should be started early in symptomatic patients with fluid overload.
- ☐ Acute hypotension may be induced initially because of sudden diuresis, especially with a loop or combined diuretic therapy.
- ☐ Renal function requires monitoring every six months to assess potassium, sodium and creatinine levels.
- ☐ For severe, persistent symptoms the synergistic effect of combined loop and thiazide therapy is more beneficial.

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Check that there are no clinical signs that the dose needs further titrating.

- ☐ Check the dosage regimen does not interfere with sleep. Thiazides should be taken in the morning because the duration of action ranges between 12 and 24 hours. The exception is chlortalidone, which has an even longer duration of action and can be taken on alternate mornings. Loop diuretics can be administered twice daily (morning and afternoon) without interfering with sleep because they act within an hour and diuresis is usually completed within six hours.
- ☐ If patients are required to monitor their weight daily, then advise them to do this at a set time each day (upon waking, before dressing, before eating or after voiding) so that any weight changes can be detected. Advise patients to report weight gain of more than 1.5–2.0 kg over two days to the doctor.[4]
- ☐ Diuretics can precipitate gout. If deemed necessary, prophylaxis with allopurinol should be considered or perhaps the dose of diuretic can be reduced.

Beta-blockers[3]

Recommended points to consider include:

- ☐ BBs are recommended for all HF patients who are stable unless contra-indicated.
- ☐ Bisoprolol, carvedilol and nebivolol are the only BBs licensed for treatment of HF.
- ☐ Ensure treatment is started at low doses and titrated up slowly to the maximum tolerated dose. Carvedilol is titrated every two weeks and is taken with food initially to prolong the time taken to reach maximum serum concentrations.[5] Bisoprolol is titrated weekly until a daily dose of 5mg is reached and then every four weeks to 10mg if tolerated. Advise patients to take bisoprolol at the same time of day because once-daily dosing gives a 24-hour effect.[6]
- ☐ Check that blood pressure and heart rate have been measured at each increment and review.
- ☐ BBs should be used with caution because they can raise plasma glucose levels and delay the hypoglycaemic response. Bisoprolol is cardioselective and may be preferred. Avoid in patients who experience frequent hypoglycaemia.

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- ☐ Avoid in asthma.
- ☐ BBs are associated with fatigue, coldness of extremities, impotence and sleep disturbances. Sleep disturbances and nightmares are more common with lipid soluble BBs because they more easily cross the blood-brain barrier. Bisoprolol is moderately lipid soluble and carvedilol is highly lipid soluble. Remember to ask about these symptoms.

ACE inhibitors and Angiotensin-II receptor antagonists[3]

The recommendations for patients with HF are as follows:

- ☐ All patients with HF caused by left ventricular dysfunction should be taking an ACEI.
- ☐ An ACEI should always be added to diuretic therapy because this regimen improves prognosis unless contraindicated.[7]
- ☐ Treatment should be started before considering beta-blockade at a low dose and this should be titrated over a minimum of four weeks.
- ☐ Blood pressure, serum creatinine and electrolytes (particularly potassium) should be measured one week after starting ACEI therapy and one week after each increase in dosage.
- ☐ Advise patients to sit or lie down for 2–4 hours after an initial dose to reduce the risk of first-dose hypotension.
- ☐ Check if an irritating, dry cough has developed since starting ACEI therapy. If the cough is persistent an A2RA is recommended as an alternative. At the time of writing, candesartan and losartan are the two A2RAs licensed for the treatment of chronic HF in the UK, provided ACEIs are either unsuitable or contraindicated. This licence has recently been extended to losartan and the MHRA have reinstated the black triangle specific to this indication. Remember to check that the dose is titrated weekly to the usual maintenance of 50mg daily.
- ☐ Concomitant use of spironolactone needs careful monitoring because of the risk of hyperkalaemia. Avoid other potassium-sparing diuretics and potassium supplements.
- ☐ Advise patients to report common adverse effects, such as dizziness or cough.

Aldosterone antagonists — spironolactone and eplenerone

The following points should be considered for patients being given aldosterone antagonists:

- ☐ Treatment is considered (in particular with spironolactone) for moderate-to-severe HF where patients remain symptomatic despite optimal ACEI and BB treatment. Eplenerone is not

currently licensed to treat chronic HF.

- Serum electrolytes (particularly potassium) and creatinine should be checked within one week of starting treatment, then again after four, eight and twelve weeks, and then every three to six months.
- Monitoring for hypovolaemia and hyperkalaemia is required. If hyperkalaemia occurs the dose may need to be reduced. Advice on avoiding foods containing high levels of potassium should be given.
- Spironolactone is associated with gynaecomastia, nausea, vomiting and diarrhoea. Remember to ask about these adverse effects.

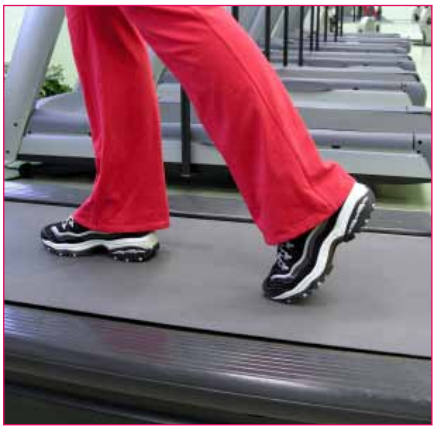
Patient discussion points

The review should give the patient an opportunity to discuss any concerns they have about their treatment. The health care professional should explore whether the medications are monitored appropriately, if the dosage regimens need simplification and if any adverse effects or significant interactions are present. This includes some OTC medications such as NSAIDs that can exacerbate HF and pseudoephedrine, which can precipitate arrthymias and elevate blood pressure.

Remember to check that the patient is not self-medicating with SJW for depression because this has clinically significant drug interactions associated with HF medications. This is important to check because depression tends to be more common in HF patients.[7]

Lifestyle interventions should be discussed and advice given accordingly. Some examples include minimising salt (<6g/day)[4] and saturated fat intake, weight reduction, blood pressure control and limiting alcohol consumption.[7] Patients should be encouraged to participate in aerobic exercise (such as brisk walking) and resistive exercise (such as weight training) to reduce their symptoms and improve their quality of life.[7] Patients who smoke must be strongly encouraged to quit. Referral to smoking cessation services should be considered. Patients should be offered a 'one-off' pneumococcal vaccination and a yearly 'flu' vaccination.[7]

Treatment of associated co-morbidities should also be discussed with the patient. Some examples include anticoagulants for atrial fibrillation, statins for atherosclerotic vascular disease and amlodipine for hypertension or angina.



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Summary

Pharmacological treatment of HF primarily uses a combination of BBs, diuretics and ACEIs to maximise the functional capacity of the heart, thereby reducing symptoms and improving prognosis. The review should identify whether these medications are monitored and titrated appropriately or, if despite their use, symptoms are persisting or worsening. It is important that these medications are reviewed and lifestyle education is given to the patient because HF has a poor prognosis if not managed properly. ✣

Declarations of interest

The author has no interests to declare.

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Treatment of HF is centred on the use of BB's, ACEI's and diuretics. They can carry a risk of harm to the patient if not titrated or monitored closely.

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