Care of patients with chronic heart failure: registered nurses' role

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To care for patients with chronic heart failure is challenging, because of the progressive nature of the condition. The aim of this article is to provide a review of the nursing care of chronic heart failure patients.

The management of heart failure focuses on a combination of pharmacological therapy, nutritional therapy and other interventions. Based on the pathophysiology of the condition, the nursing care of chronic heart failure patients involves continuous monitoring of physiological parameters, monitoring medication administration and side-effects of medication, fluid balance monitoring and assistance with tolerating exercise. Mental health issues, night-time comfort and patient education are also very important.

Finally, palliative care for end-stage heart failure patients is also discussed because it is essential to integrate the idea of palliative care throughout the management of heart failure patients.

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Introduction

Many years ago, in 1933, Thomas Lewis defined heart failure as follows: "A condition in which the heart fails to discharge its contents".[1] Many definitions followed this one of which some are very complicated. The American Heart Association (AHA) went back to a simple approach in defining heart failure as follows: "...a chronic, progressive condition in which the heart muscle is unable to pump enough blood through the heart to meet the body's needs for blood and oxygen. Heart failure usually results in an enlarged heart".[2] On the website of AHA, an animation of heart failure can be viewed if you follow this link: https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure.

In sub-Saharan Africa (SSA), heart failure is an increasing problem because cardiovascular risk factors are increasing. Although cardiovascular disease is growing in Africa, it needs to be remembered that causes of heart failure that have always been part of Africa, like rheumatic heart fever, are still causing the disease. In high-income countries, heart failure is mostly a condition of older individuals, whereas younger persons are affected in SSA.[3] However, there is a tendency of increased life expectancy in African populations, which means that the number of persons with heart failure could also increase because more Africans will become older than is currently the case.[4] Accurate incidence numbers for the SSA region are unfortunately not available.

The aim of this article is to provide a review of the nursing care of chronic heart failure patients.

Pathophysiology and causes of heart failure

Pathophysiologically, different sources classify heart failure differently. Some classify it according to the ejection fraction; in other words, the amount of blood (percentage of filling volume) that the heart can eject. Others classify it as a left ventricular failure and a right ventricular failure. The latter classification will be used in this article.

The leading causes of left ventricular failure are: left valvular disease, hypertension, cardiomyopathy, disease of the pericardium, thyroid problems, obesity, while it can also develop after myocardial infarction (coronary artery disease). Right ventricular failure can result from pulmonary hypertension (cor pulmonale), right valvular disease, myocardial disease of the right side of the heart, congenital heart disease, myocardial infarction and advanced left heart failure. It is often a progressive disease.

In the case of left ventricular failure, the left ventricle is unable to pump blood from the ventricle to the aorta and the body. This deficiency results in blood that pools in the alveoli of the lungs, causing oedema in the lungs. This, in turn, leads to impaired gas exchange.[5] The problem with the heart is, therefore, a problem with the pumping function of the heart.

When the right ventricle of the heart fails, the right ventricle cannot receive all the blood that returns from the systemic circulation and/or cannot pump the blood to the lungs. In this case, the venous pressure is increased, and it results in congestion of the viscera and body's tissues. Widespread oedema is the result.[5]

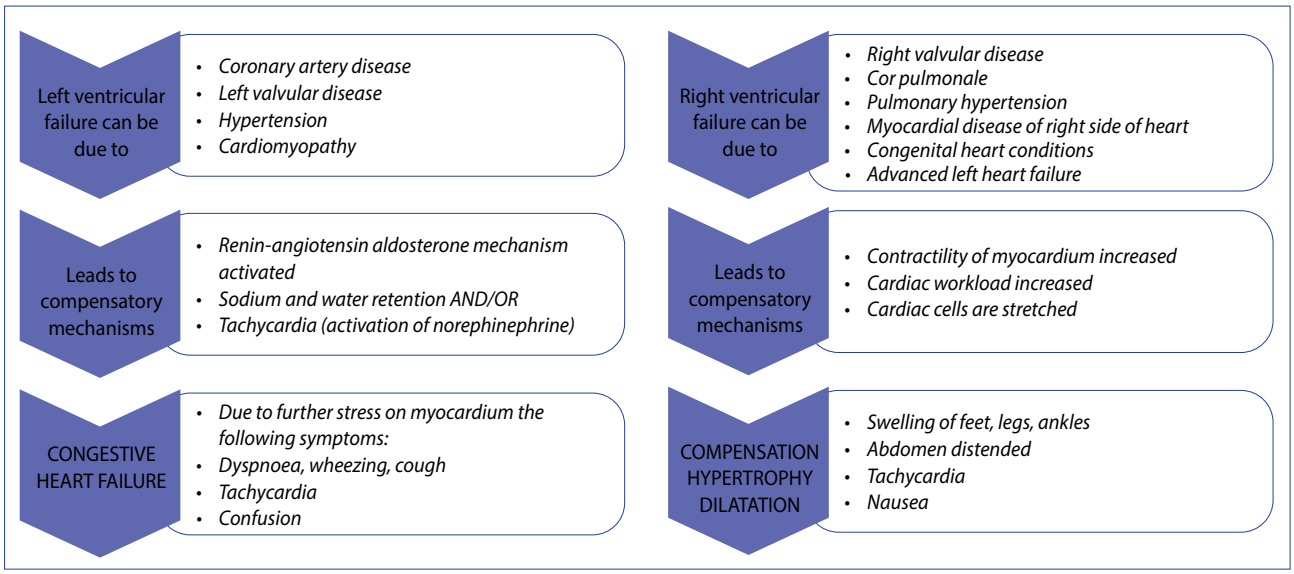

Figure 1: Pathophysiology and comparison between left and right heart failure

Compensatory physiological actions develop as heart failure progresses. Epinephrine and norepinephrine are secreted by the sympathetic nervous system when the volume that is ejected by the heart is decreased. The renin-angiotensin-aldosterone mechanism is then activated. This means that sodium is retained and with the sodium, fluid will also be retained. The result is that the fluid volume of the body is increased and, therefore, the workload of the heart is increased. Muscle fibres' contractility is reduced. In order to compensate for this increased workload, the heart muscle becomes thicker.[5]

Signs and symptoms of heart failure

The symptoms of right and left heart failure differ due to the differences in the pathophysiology.

Patients with left heart failure have dyspnoea (shortness of breath) during activity and oxygen saturation levels that are low. Fatigue is present most of the time. The oedema of the lungs further leads to cough and crackles or wheezing that can be heard during auscultation. They have tachycardia and are restless.[6]

Right-sided heart failure patients have enlarged livers (hepatomegaly), ascites and splenomegaly resulting in gastrointestinal distress and anorexia, distended jugular veins and swelling of feet, legs and ankles.

Diagnosis

Several diagnostic tests can be done to confirm a diagnosis of heart failure. An enlarged cardiac shadow, changes in blood vessels and/or an abnormal cardiac contour could be visible on a chest X-ray. Electrocardiogram (ECG) changes might be visible, like ventricular or atrial hypertrophic changes, tachycardia, ischaemia, atrial fibrillation, premature ventricular contractions and ST-segment changes. A stress ECG is usually done to assess myocardial ischaemia and the motion of the heart muscle. Cardiac catheterisation can be very valuable because valve abnormalities can be identified, pressures and ejection fractions can be determined, coronary arteries' condition can be assessed, and endomyocardial biopsies can be obtained. Other diagnostic tests include heart sonar (sometimes via the oesophagus), PET scan and a variety of blood tests like liver functions, electrolytes, clotting time, kidney functions, serum albumin, complete blood count, natriuretic peptide, cardiac troponin and arterial blood gases.[5,6]

Management of heart failure

The management of heart failure focuses on a combination of pharmacological therapy, nutritional therapy and other interventions.

Medication that is usually prescribed for patients with heart failure could include items from the following groups of medicines – often, it will be a combination of two or more of the groups:

- Angiotensin-converting enzyme inhibitors (ACE inhibitors): Vasodilatation and diuresis are promoted, exercise tolerance is expanded, and heart failure progression is slowed down.
- Angiotensin II receptor blockers (ARBs): They improve cardiac output by decreasing blood pressure because systemic vascular resistance is decreased.
- Beta-blockers: The effects of sympathetic nervous system stimulation are reduced.
- Diuretics: The fluid overload is managed by increasing urine output.[5]
- Neprilysin inhibitors: This new class of drug is used in combination with ARBs to reduce vasoconstriction and sodium retention.[7]
- Calcium-channel blockers (CCBs): These are sometimes mentioned but are never used in systolic dysfunctional

heart failure. They reduce systemic vascular resistance, and therefore vasodilation follows.

Nutritional therapy focuses on the restriction of sodium (salt). Patients with ischaemic heart disease should also be put on a low fat and low cholesterol diet. If possible, heart failure patients should be referred to a nutritionist. Emphasis is on patient compliance with diet therapy.[6] Nutritionists/dietitians are not always available – in these cases, the nurse should teach the patient what he/she may or may not eat.

Other interventions for patients with heart failure could include oxygen therapy, physiotherapy for the patients' lungs, patients could receive a pacemaker for conduction problems. A cardiac transplant would be the survival strategy for younger patients with end-stage heart failure.

Nursing care

Probably the most crucial role that the nurse can play in the care of patients with heart failure is to act as a coordinator of a multidisciplinary team. She further needs to be available to "translate" every piece of information that the patient receives into an understandable format so that the patient is aware of what is happening with him or her and can, therefore, comply with the therapy or treatment. For the purpose of this article, the focus will be on the roles and responsibilities of the nurse in the care of patients with chronic heart failure and not acute heart failure. There are many similarities in the care of chronic and acute patients. However, acute heart failure patients are usually cared for in an intensive care unit (ICU) or high care unit with all the special and necessary monitoring equipment available.[5,8] Chronic heart failure patients are cared for in the community or are admitted to chronic hospital wards or terminal care settings like hospices. Furthermore, patients (usually younger patients) that might qualify for heart transplant are also not part of this discussion because of the specialised care that this group of patients needs.

The nurse has to assess the patient's chronic heart failure thoroughly in order to be able to have a baseline from where further nursing actions can be planned and undertaken and also to be able to see if the patient improves or not.

The actions that the nurse will further undertake will depend on the specific patient's history and needs which have been identified. These could include the following:

Continuous monitoring

All elements that are mentioned in the second row of Table I should be monitored and recorded meticulously and as often as necessary. This will include a lung assessment with the auscultation, respiratory rate and oxygen saturation levels. Heart rate and auscultation are also of much importance, including ECG monitoring. Blood pressure should be monitored, based on the patient's condition and not per ward or clinic protocol. Anorexia, nausea and vomiting are essential for the nutritional status of the patient, and it should be monitored and addressed if problems are identified.[5,8]

Table I: Nursing actions important for assessment when caring for chronic heart failure patients

Taking of patient history	Time when symptoms started (how long ago) Description of symptoms, like chest pain, what triggers fatigue, exercise capacity, sexual activity and more Sleep disturbances like sleep interrupted by shortness of breath Medication that patient is currently using Weight gain or loss Hospitalisations for the problem Other relevant problems like thyroid Compliance with medication Dysrhythmias[5,6] Involve next of kin if necessary
Do physical examination (and repeat regularly)	Lung auscultation – wheeze, crackles Respiratory rate Oximetry Heart auscultation – extra heart sounds, murmurs, dysrhythmias ECG Heart rate Blood pressure and pulse pressure (width of blood pressure) Distention of jugular vein Level of consciousness Perfusion and oedema (cold extremities) Liver distention, ascites Measurement of urinary output Look at and evaluate the blood test results that were ordered by the medical team – especially electrolytes, renal and liver functions Patient weight and BMI[5,6] Assess patient's mental health (like anxiety)
Assess patient's level of knowledge about his/her condition	Understanding of heart failure and what is happening to him/her at the moment The reason for taking each of the prescribed medications Knowledge of diet Understanding exercise in heart failure[5,6] Next of kin can be involved in this assessment Ask patient about his/her needs for information

Monitoring of medication

It is of utmost importance that the nurse should be familiar with the pharmacokinetics and pharmacodynamics of the patient's medication. Most importantly, the nurse needs to be aware of the possible side effects of the medicine. The patient should be monitored for these, for example, electrolyte levels when the patients are using diuretics or coughing when using ACE inhibitors.[5,8]

Fluid balance

The patient's perfusion and oedema should be monitored, for example, swollen feet. The patient can be weighed regularly. The nurse should determine if the patient's fluid overload is addressed, and if the patient adheres to a low sodium diet. Renal function and fluid intake and urine output are important factors to monitor.

Exercise and work

It is crucial to determine the optimal level of exercise that the heart failure patient can tolerate. The patient's doctor and physiotherapist could assist with this. Symptoms that the patient experiences during training should be taken note of and reported, for example, swollen legs or chest pain. It is in

the best interest of the patient to be kept active for as long as possible. The nurse, doctor and physiotherapist could recommend exercises that can be done.[5,8]

Should the patient still be able to work, an occupational therapist could be consulted to advise the patient on how to use his or her energy efficiently. To be able to work, will enhance mental health.

Mental health issues

Because of physical discomfort, heart failure patients are often anxious, and they have feelings of powerlessness. The nurse can assist by helping the patient to identify situations that lead to anxiety and helplessness and assist the patient in controlling these by giving information about self-care or by communicating with the other team members so that the patient can be supported with symptom control. Cognitive impairment also needs to be assessed and reported.[5]

Night-time comfort

Symptoms experienced during the night can impact much on patients' quality of life (QoL). A major problem is orthopnoea. The nurse needs to help the patient to find the most comfortable way to sleep, with enough pillows to ease the problem but not so many that it causes neck or back discomfort. Pillows specially shaped for the patients' needs are available and could be recommended by the nurse. If necessary, oxygen could be administered. Patients may also experience pain of anginal, musculoskeletal or other origin. This problem needs to be communicated to the doctor so that pain medication can be prescribed and pain relief can be provided. Medication for insomnia can also be prescribed if needed.[8]

Patient education

As the professional who probably spends the most time with the patient, interacting with the patient, the nurse is the person who needs to provide the patient with education regarding his/her condition – this will include knowledge of pathophysiology, about the medication (what is prescribed and why?), what can be done to relieve symptoms, and why certain medical tests and interventions are necessary. The aim is to empower the patient to take control of the condition to the best of his/her ability. It also serves to help the patient to become literate about heart failure, taking his/her level of comprehension into account. It needs to be emphasised that it is essential to involve the family in the patient education process.[3,8]

The heart failure patient and palliative care

It is unfortunate that in the case of heart failure patients, palliative care is not regarded as important as is the case for oncology patients. It is essential to integrate the idea of palliative care throughout the management of heart failure patients.[9] The patient and family need to be involved in discussions focusing on palliative care. Westlake and Smith, in their article, tabulated appropriate symptom management, emphasising the vital issue of 'relief from suffering' and classify it as physical, psychological, social/functional, and then they add spiritual suffering to these.[9]

The mentioned authors state that a transition needs to be made to end-of-life care or hospice care depending on QoL. This is usually the time when potential benefits of treatment are outweighed by potential harm of the treatment. This decision involves the patient, family and multidisciplinary team. The prediction of when end-of-life care should begin is even more complicated than with oncology patients, but there should be an honest and open relationship between all involved all of the time.[9]

Conclusion

To care for heart failure patients is no easy task. A professional nurse equipped with knowledge regarding the condition and willing to update him/herself continuously with evidence-based knowledge regarding the care of these patients is what is needed. Louise Brady expresses it as follows: "Practice nurses have an integral role to play in supporting patient education, access to quality information, enabling health literacy and patient empowerment."[8]

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(Note: For valuable information regarding heart failure in the South African context, visit the website of **Heart Failure South Africa** (HeFSSA) hefssa.org. The GP resources are of much value – it contains information in a reader-friendly format regarding many important heart failure topics.)

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