Heart Failure and Cognitive Impairment

Description/Etiology
Heart failure (HF) is a progressive clinical syndrome in which the heart fails to pump a sufficient supply of blood to the body due to a functional or structural disorder. HF is the endpoint of several types of cardiovascular disease. Although it can be treated with drugs or heart transplantation, HF is often fatal (for more information, see Quick Lesson About ... Heart Failure: an Overview).

Cognitive impairment is commonly reported in patients with severe HF; all patients with HF should be screened for cognitive decline. The exact etiology of cognitive impairment in HF is unclear; factors that might contribute to cognitive impairment in patients with HF include cerebral ischemia resulting from decreased cerebral perfusion, cerebral infarction resulting from emboli migration to the brain, and impaired cerebrovascular reactivity.

Patients with cognitive impairment might be unable to understand or comply with the prescribed HF treatment regimen or to recognize worsening symptoms. Cognitive impairment in patients with HF is associated with decreased quality of life (QOL), increased utilization of healthcare resources related to HF, and increased mortality; the degree of impairment is associated with the severity of HF manifestations. Treatment of HF, which is aimed at improving cardiac output and cerebral perfusion and regulating heart rate and blood pressure, can partially reverse HF-related cognitive deficits. Cognitive impairments related to HF can also be moderated by diet; a diet containing a variety of fruits, vegetables, lean meats, fish, low-fat dairy products, and whole grains might slow or cease cognitive decline.

Facts and Figures
HF affects about 5.1 million individuals in the United States, with more than 650,000 new patients diagnosed each year. Cognitive deficits affect 28–58% of patients with HF. HF is associated with a 2–4-fold increased risk for developing cognitive impairment.

Risk Factors
Comorbid diseases or conditions often contribute to cognitive decline in older patients with HF. The degree or rate of cognitive decline is directly related to decreases in left ventricular ejection fraction, cardiac output, and systolic function. Other factors that increase the risk for cognitive impairment in HF include depression, sleep-disordered breathing (i.e., obstructive sleep apnea), and anemia.

Signs and Symptoms/Clinical Presentation
Signs and symptoms of HF include tachycardia, pulmonary congestion, hepatosplenomegaly, water weight gain, extreme fatigue, peripheral edema, decreased urination, poor peripheral circulation, pallor, and exercise intolerance. Cognitive deficits manifest as difficulty with complex reasoning, memory lapses, poor concentration skills, forgetfulness, slowed reaction time, and confusion.
Assessment

› **Patient History**
  • Ask patient and/or family about past and current signs of cognitive impairment (e.g., personality changes, memory difficulties, judgment abnormalities, and difficulties performing activities of daily living [ADLs])

› **Physical Findings of Particular Interest**
  • Patient might have pulmonary congestion, tachycardia, peripheral edema, and/or pallor

› **Laboratory Tests**
  • B-type natriuretic peptide (BNP) elevation indicates LV dysfunction (normal value ≤ 100 pg/mL)
  • Serum electrolyte panel might show electrolyte imbalance, which can result from the use of some medications (e.g., diuretics) used to treat HF
  • CBC might reveal anemia

› **Other Diagnostic Tests/Studies**
  • Echocardiography with Doppler flow studies can show abnormalities in cardiac structure and heart function
  • EKG can identify arrhythmias
  • Chest X-ray might show ventricular enlargement
  • Cardiac catheterization can identify abnormalities
  • An assessment tool for cognitive impairment (Global Deterioration Rating Scale, Mini-Mental State Exam, Geriatric Depression Scale, Draw-A-Clock Test) can be used to evaluate for impaired cognition (for more information, see *Nursing Practice & Skill ... Depression Assessment in Older Adults: Using the Geriatric Depression Scale*)

Treatment Goals

› **Promote Optimum Physiologic and Cognitive Function**
  • Monitor vital signs, assess all physiologic systems (especially neurologic and cardiac), and review lab/diagnostic study results; immediately report abnormalities to the treating clinician provide prescribed treatment
  • Assess **fall risk** due to confusion and other HF-associated manifestations; maintain patient safety (e.g., airway, circulation, and prevention of injury) (for more information, see *Evidence-Based Care Sheet: Falls, Accidental: Risk Assessment*)
  • Administer prescribed medications to treat HF; monitor the effectiveness of treatment and for adverse effects
  - Diuretics, angiotensin-converting enzyme (ACE) inhibitors, angiotensin-receptor blockers (ARBs), beta blockers, digitalis, direct vasodilating drugs, calcium channel blockers, and/or anticoagulants can be prescribed (for more information, see the series of *Quick Lesson* papers on medications administered to treat HF). Monitor for potential adverse effects, including but not limited to the following:
    - Potassium loss, fatigue, weakness, numbness, tingling, cramping, vomiting, and constipation from diuretics
    - Dry cough, increased potassium, low blood pressure, dizziness, headache, and drowsiness from ACE inhibitors
    - Headache, cough, fever, dizziness, diarrhea, and sore throat from ARBs
    - Cold extremities, fatigue, and nightmares from beta blockers
    - Anxiety, blurred vision, confusion, dizziness, headache, anorexia, hallucinations, nausea, and vomiting from digitalis
    - Fatigue, flushing, edema, and heartbeat from calcium channel blockers
    - Bleeding from anticoagulants
  • Request clinician referral, if appropriate, to a mental health clinician specializing in the treatment of cognitive impairment associated with HF
    - Administer psychotropic or other medications, as ordered, for treatment of cognitive impairment; monitor for potential side effects prior to administration
    - Educate patient/family about the risks and benefits of psychotropic medications

› **Provide Emotional Support and Educate**
  • Assess patient/family anxiety level and ability to cope with a life-altering disease and disturbances in cognition; provide emotional support, educate, and encourage discussion about HF pathophysiology, its common association with cognitive impairment, potential complications, risk factors, treatment risks and benefits, coping with a life-threatening condition, and individualized prognosis
  • Individualize the education based on patient assessment; encourage questions and allow extra time for discussion because patients with cognitive impairment often forget questions they intended to ask during visits by the treating clinician
  • Request referral to a social worker for identification of local resources for in-home care, educational programs on HF and cognitive impairment, and memory training programs
Food for Thought
› Healthcare providers often focus on physical manifestations and life-threatening symptoms of HF and can overlook cognitive dysfunction
› Cognitive decline is more pronounced in younger persons with HF, particularly those awaiting heart transplantation
› In a study of 18 patients with HF, researchers found that cognitive dysfunction predicted impaired performance (e.g., more collisions and missed stop signs) in a simulated driving scenario (Alosco et al., 2015)
› In a study of 136 older adults with HF, researchers in Japan reported that the presence of cognitive impairment was associated with a 7.6-fold increased risk of hospital readmission or death due to HF (Saito et al., 2015)

Red Flags
› Treatment regimens and behavior modification associated with lifestyle changes for patients with HF are very complex and can be challenging for the cognitively impaired
› Patients with cognitive impairment might not be competent to understand and provide informed consent for procedures or treatments

What Do I Need to Tell the Patient/Patient’s Family?
› Remind the patient and caregivers that medication management and compliance is key to prevent HF readmission in patients with impaired cognitive status
› Educate patient and caregivers about continued care in the home, including medication schedules, dietary constraints, and exercise; provide written materials, if available, and confirm that the caregiver can monitor the patient’s daily weight, heart rate, and blood pressure
› Emphasize the importance of continued medical surveillance and seeking immediate medical attention if adverse drug effects develop or for new or worsening signs and symptoms
› Encourage caregivers to become educated in strategies for providing mental stimulation, such as memory training programs

References