

Cognitive impairment and congestive heart failure.
Joanne Lackey. Nursing Standard. July 14, 2004 v18 i44 p33(4).

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Abstract

Background The course of heart failure can be unpredictable and uncontrolled symptoms are the main problem. This review analyses the current literature surrounding cognitive impairment and heart failure with special emphasis on self-management and quality of life. It attempts to explain the extent to which compliance and self-management contribute to acute hospitalisation, and to what extent the patient's mental capability influences compliance with treatment.

Conclusion The literature identifies a link between congestive heart failure and cognitive impairment.

Key words

- * Cardiovascular disorders
- * Cognitive impairment
- * Patient assessment

These key words are based on the subject headings from the British Nursing Index. This article has been subject to double-blind review.

CONGESTIVE HEART failure is a complex syndrome 'that results from any structural or functional cardiac disorder that impairs the ability of the heart to function as a pump' (Cowie and Zaphiriou 2002). The management of heart failure has become a great challenge to the NHS in recent years due to a rising older population and greater survival rates from acute myocardial infarction.

Congestive heart failure is a burden on the budget of most healthcare systems in the developed world. Cowie and Zaphiriou (2002) report that congestive heart failure accounts for between 1 and 2 per cent of healthcare expenditure in the UK. Rogers et al (2000) note its significance as the main cardiovascular disease, with increasing rates of incidence and prevalence. The National Service Framework for Coronary Heart Disease (DoH 2000) has addressed the needs of a rising older population by standardising treatment for heart failure to lower mortality and improve quality of life.

The link between congestive heart failure and cognitive impairment

When caring for and treating patients with heart failure, there is a tendency to focus on the physical manifestations of the disease. In the acute setting, when the patient is critically ill, physical stabilisation is paramount. However, having stabilised the patient,

mental assessment can often be overlooked, even though the reason for admission may have been of a cognitive nature, such as inability to cope with treatment regimens. Lack of mental assessment may become evident when the patient demonstrates memory problems, leading to poor compliance with medication and reduced self-management (Rogers et al 2000). Cognition refers to mental activities related to thinking, memory and learning (Riegel et al 2002). This suggests that impaired cognition should be suspected when a patient displays changes in memory, judgement, personality or ability to complete usual activities. These traits are often observed in patients with heart failure (Riegel et al 2002).

Almeida and Flicker (2001) report that as many as 80 per cent of patients with severe heart failure exhibit memory deficits and other cognitive dysfunction such as attention deficits. Many patients with heart failure are older and age can be an independent cause of poor cognition. Zuccala et al (1997) studied cognitive dysfunction in older patients with mild to moderate heart failure. They found impairment to be common and independently associated with lower left ventricular ejection fraction. Interestingly, they also reported that deficits were found in younger patients awaiting cardiac transplantation. As with older patients, these deficits were attributed to reduced cerebral blood flow.

Almeida and Flicker (2001) acknowledge that low ejection fraction and cardiac output might cause impaired cognition. It could be possible that comorbidity also contributes to cognitive dysfunction, and that atrial fibrillation, for example, could cause problems with cognition as a consequence of ischaemic heart disease. Cerebrovascular disease has been identified as another likely cause of cognitive impairment, and Almeida and Flicker (2001) suggest that this is because many patients with congestive heart failure also have other cardiovascular complications and are at increased risk of developing stroke. Other possible causes have been emphasised in the literature. Riegel et al (2002) considered nutritional deficiencies, depression, infection and dehydration as potential causes for cognitive impairment but found no association. Zuccala et al (1997) found that depression was common in older people but it was not associated with cognitive performance.

Riegel et al (2002) acknowledge that other possible mechanisms for cognitive impairment deserve further investigation. These include white matter lesions from silent cerebral infarction and increases in haemodynamic pressure, for example, right atrial pressure. Taylor and Stott (2002) also found the issue of cerebral circulation an important one. They suggest that low-grade cerebral ischaemia could be attributed to congestive heart failure, but also to age and low systolic blood pressure. The authors highlight the hypercoagulable state associated with congestive heart failure and suggest that abnormalities in haemostasis and thrombosis may be important factors in the pathogenesis of ischaemic damage (Taylor and Stott 2002). This demonstrates the many variables that may contribute to impaired cognition rather than congestive heart failure in isolation.

The causes of cognitive impairment in heart failure remain unclear, and may be the result of a combination of pathophysiological

disturbances. The role of systolic blood pressure is a dominant theme in the literature. In a large prospective study that examined whether arterial hypotension might be associated with cognitive impairment among older participants with heart failure, Zuccala et al (2001a) found that systolic hypotension was selectively associated with cognitive impairment among this group. Riegel et al (2002) also highlight the correlating factor of systolic hypotension despite the constraints of a relatively small study with a limited sample size.

Hence the literature, though limited, suggests there is a strong link between cognitive impairment and heart failure (Almeida and Tamai 2001a, Antonelli et al 2003, Riegel et al 2002), yet acknowledges that further studies are required to determine definitive causes. Importantly, the literature provokes examination of the impact of cognitive impairment on the individual and their carers, and whether it could affect morbidity and mortality. Almeida and Flicker (2001) report that up to 80 per cent of patients with severe congestive heart failure display deficits in memory and other cognitive abilities that could affect morbidity and mortality. It also raises the question of how well healthcare professionals are detecting and treating this neglected aspect of congestive heart failure.

The impact of cognitive impairment in heart failure

Zuccala et al (1997) found the biggest deficit in cognition to be that of complex reasoning. They report that the same deficits had been identified in younger patients who were awaiting cardiac transplantation. In a qualitative, interview-based study by Rogers et al (2000), confusion and short-term memory loss were reported to be the main symptoms of heart failure, strongly affecting communication, in particular their ability to ask preplanned questions of clinicians. Grubb et al (2000) relate memory loss with anxiety and depression specifically to problems with compliance and adherence to complex treatment regimens. In contrast to other researchers in the field, they state that 'cognitive function, including memory, could be affected by anxiety and depressive states' (Grubb et al 2000). Antonelli et al (2003) recently assessed verbal memory impairment in patients with heart failure, finding it to be uniformly high in patients with moderate to severe heart failure. However, the authors stressed that screening methods for cognitive dysfunction were not yet accurate.

Impaired cognition affects patients and their carers in the day-to-day management of their condition. Surveys indicate that physical, social, work and leisure activities are significantly impaired among patients with congestive heart failure (Almeida and Tamai 2001b). Cognitive impairment may further increase morbidity and mortality in this patient group (Almeida and Tamai 2001 b). This insight has great implications for the service provided for these patients, for example, offering them exercise for cardiac rehabilitation. From both an ethical and moral perspective, it is important to assess the mental state of heart failure patients alongside their physical symptoms, and also to determine the effects of cognitive impairment on self-management.

Cognitive impairment and self-management in heart failure

Working in the acute setting, communicating with patients with heart failure, especially in relation to tissue hypoxia and the ability to

follow instructions and comprehend treatment regimens, is complex and requires a skilled and sensitive approach to patient care. This highlights the important issue of consent, especially relating to invasive procedures when a patient may be cerebrally compromised. Following discharge, this can affect long-term day-to-day management of the disease, such as following instructions regarding medication doses and fluid management. Cowie and Zaphiriou (2002) emphasise the benefits of patient focus groups to aid understanding of cardiovascular disease. They suggest that discussions will improve patients' understanding of the condition and will help to empower them to adopt a more active role in their care and management (Cowie and Zaphiriou 2002).

Rogers et al (2000) discuss how patients with congestive heart failure find it difficult to absorb and retain information and may not appreciate its relevance. Patients in this qualitative, interview-based study blamed confusion or short-term memory loss for their inability to ask planned questions of their clinicians. Fatigue also played a role and many patients were unaware of what heart failure actually was and the likely prognosis (Rogers et al 2000). Inability to remember and assimilate information may be contributing to the high readmission rates seen with heart failure. Carlson et al (2001) suggest that self-care is difficult because of the functionally compromised position of the patients. The patients' knowledge is often poor and misconceptions are evident, leading to low confidence and high readmission rates. A similar view is shared by Ekman et al (2002) who discuss the impact of severe congestive heart failure on older patients. They found that these variables, that is, being older and having congestive heart failure, were especially associated with limited functional abilities and impaired quality of life.

This emphasises how important it is for hospital and community nurses to maintain stability in these patients. The main factor in maintaining stability is compliance with treatment regimens. Cline et al (1999) assessed concordance with prescribed medication in older patients with heart failure. They identified that only 55 per cent of patients could correctly name their prescribed medication and 27 per cent were found to be non-concordant. Efforts were made by healthcare professionals in the study to provide adequate information but poor knowledge remained a problem. This reinforces the difficulties facing practitioners in preventing hospital readmissions in this group of patients.

Identifying cognitive impairment and successfully treating it is a huge challenge facing practitioners, especially in the community setting. Even if it is positively diagnosed, the difficulty lies in treating and possibly reversing symptoms in the presence of old age, co-morbidity and a limited support network.

Barriers to successful screening and treatment of poor cognition

The role of the heart failure specialist nurse is vital to the effective management of heart failure patients in the hospital setting. Using nurse-led clinics many patients are holistically assessed and monitored at regular intervals. However, geographical variations may lessen effective liaison between hospital and community settings, resulting in some patients not receiving effective treatment. Bennett et al (2000) advocate the use of focus groups to improve symptom management but limited resources may prevent this. Rogers et al (2000)

emphasise difficulties encountered by heart failure patients, including the use of public transport, walking over distances and intolerance of crowds.

Other barriers to assessing and detecting cognitive dysfunction include time, resources, availability of skilled practitioners and consensus on the use of effective assessment tools (Swain et al 1999). The mini-mental state examination (MMSE) is used in most of the reviewed studies. Swain et al (1999) compared the abbreviated mental test (AMT) with the MMSE in assessing hospitalised patients and found that the AMT was more useful in assessing cognitive function.

Riegal et al (2002) explored four screening measures of cognitive impairment in heart failure patients. They found that no single screening test was sufficient to detect cognitive impairment, perhaps due to the impairment being early or intermittent. They did, however, advocate the 'draw-a-clock test' as the most effective method of assessing community-based patients with early impairment. Research on such screening methods is limited and prompt investigation is needed into cognitive tests, as early diagnosis appears paramount.

Zuccala et al (1997) state that dementia in advanced age may be prevented or delayed by early detection of cognitive impairment combined with prompt intensive treatment of left ventricular systolic dysfunction. Watson and Gibbs (2000) highlight how symptom progression in heart failure patients may be delayed by the initiation of angiotensin converting enzyme (ACE) inhibitors. This may suggest that such treatment may also delay the onset of cognitive impairment in heart failure if poor cognition can be purely attributed to left ventricular dysfunction. Grubb et al (2000) indicate that anxiety, depression and cardiovascular disease are influencing factors in cognition. With so many possible aetiologies for poor cognition, controversy exists as to whether maximising heart failure treatment can improve cognition. Studies on the reversal of cognitive dysfunction are limited. Almeida and Tamai (2001b) set out to demonstrate this by showing that increasing medical treatment over six weeks improved attention scores in heart failure patients. In a further study in 2001, they studied hospitalised patients and felt that other factors such as co-morbidity and age affected cognition, recommending that future studies should clarify mechanisms of impaired cognition as well as offering strategies to prevent and treat deficits (Almeida and Tamai 2001a).

Taylor and Stott (2002) question whether cognition can be improved in heart failure patients. The only clear positive data as yet relates to improved cognition following cardiac transplantation. Putzke et al (1998) found that haemodynamic pressure variables were consistently inversely related to cognitive functioning among heart transplant candidates with improvement following surgery. Further studies may yield some interesting results in the future. Results are awaited from a study using perindopril with older heart failure patients and the effect of ACE inhibition on cognitive change (Taylor and Stott 2002).

Conclusion

The literature shows a positive link between congestive heart failure and cognitive impairment, to a greater or lesser extent. Despite the

increased prevalence of heart failure, the significance of this remains widely unrecognised by health professionals. Sangha et al (2002) suggest that by ignoring cognitive dysfunction the patient becomes less self-reliant, ultimately resulting in increased mortality. Zuccala et al (2001b) emphasise the overwhelming challenge it poses to patients, carers and public health services. Although the exact cause remains unclear, the literature advocates early assessment and diagnosis so treatment can be initiated to prevent premature morbidity and mortality (Almeida and Tamai 2001b, Zuccala et al 2001b). It also urges recognition of psychological illness as a common side effect of cardiovascular disease (Grubb et al 2000). As the incidence of heart failure increases and the literature becomes more widely available, healthcare professionals should embrace this neglected area. Quality of life, disability and cognitive impairment are complex areas and are more time consuming to measure than mortality or days of hospitalisation (Taylor and Stott 2002). Further long-term research needs to be initiated to promote good quality care and to enhance the quality of life for patients with cognitive impairment and heart failure. Although there are often time and workload constraints, rather than concentrating purely on physical problems, nurses in the acute setting should be assessing mental capability more deeply, and initiating prompt referral to specialists when necessary. Clinical psychologists may be underused in the hospital setting where the causes of heart failure admissions are often psychological in nature.

The findings of this literature review also provide evidence for increased numbers of community heart failure nurses to screen patients for impaired cognition and treat early and appropriately, thus preventing needless hospital admissions. From an ethical perspective, this aspect of heart failure assessment should be addressed if positive implications for morbidity and mortality are to be more definitely confirmed. Riegel et al (2002) conclude by highlighting the need for future research into this branch of heart failure to improve screening methods, extend knowledge and ultimately prevent and manage this problem successfully

Implications for practice

* There is a link between congestive heart failure and cognitive impairment.

* Early assessment and diagnosis are vital.

* There is a case for increased numbers of community heart failure nurses to screen patients for impaired cognition and treat them early.

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Record Number: A119899483

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