

Quality of life in chronic disease: a comparison between patients with heart failure and patients with aphasia after stroke

Åsa Franzén-Dahlin, Monica Rydell Karlsson, Märith Mejhert and Ann-Charlotte Laska

Objectives. This study aimed to describe the impact of heart failure and of stroke with aphasia on quality of life (QoL) and to compare the different domains of QoL in these groups.

Background. The prevalence of chronic conditions has increased during the last decades, and chronic diseases such as stroke and heart failure may have a great impact on QoL.

Design. Comparative study of patients from two randomised controlled studies.

Method. Seventy-nine patients with heart failure and 70 patients with aphasia after stroke were evaluated concerning the severity of their disease and by QoL, as measured with the Nottingham Health Profile, in the acute phase and after six months.

Results. The severity of the disease improved between baseline and six month for both groups. Correlations between New York Heart Association (NYHA) class and all QoL domains were seen in patients with heart failure after six months. The degree of aphasia correlated to mobility, social, emotional and total score after six month. QoL in patients with heart failure was more affected in the domains of sleep and energy in the acute phase and in the energy domain at six months.

Conclusion. Although low energy is more frequent among patients with heart failure, both groups report poor QoL. Improvement in severity of the disease is not necessarily accompanied by improvement in QoL.

Relevance to clinical practice. Nottingham Health Profile can easily be used as a screening instrument, aiming to identify patients at risk for adverse effects on QoL. A better understanding of the subjective QoL of patients with chronic disease is fundamental for health care professionals to be able to identify and support vulnerable patients.

Key words: aphasia and stroke, heart failure, nurses, nursing, quality of life

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Introduction

The prevalence of chronic conditions has increased during the last decades, as a result of the overall ageing of the population and to improved medical treatment (Stewart *et al.* 2003). A chronic disease affects the patient not only physically; it also has an impact on quality of life (QoL). There is an increasing interest in evaluating what implica-

tions different diseases have on QoL. Stroke and heart failure are two diseases of vascular origin with a great impact on QoL. Both diseases are common, and the mean age of the affected patients in Sweden is close to 75 years, resulting in a large number of persons living with these diseases in the community (National Board of Health and Welfare 2005, Mejhert *et al.* 2001). Life expectancy in Sweden is for men 79 years and for women 83 years (Statistics Sweden 2008).

Authors: Åsa Franzén-Dahlin, PhD, RN, Karolinska Institutet, Department of Clinical Sciences, Danderyd Hospital, Division of Internal Medicine; Monica Rydell Karlsson, PhD, RN, Karolinska Institutet, Department of Clinical Sciences, Danderyd Hospital, Division of Cardiovascular Medicine and Sophiahemmet University College; Märith Mejhert, PhD, MD, Karolinska Institutet, Department of Clinical Sciences, Danderyd Hospital, Division of Cardiovascular

Medicine and Ersta Hospital; Ann-Charlotte Laska, PhD, MD, Karolinska Institutet, Department of Clinical Sciences, Danderyd Hospital, Division of Internal Medicine, Stockholm, Sweden

Correspondence: Åsa Franzén-Dahlin, Division of Nursing Sciences, Danderyd University Hospital, S-182 88 Stockholm, Sweden. Telephone: +46 865 56669.

E-mail: asa.franzen-dahlin@ds.se

Knowledge about QoL in these conditions can help health care workers to understand patients' reaction to illness, and to evaluate rehabilitation outcome and to plan future care. QoL is a broad, multidimensional concept that covers several dimensions including the physical, functional, psychological and social domains (Aaronson 1988, Ware 1993). There are many scales aiming to assess QoL, both general and disease specific. The latter are often more sensitive to issues particularly relevant to a specific group of patients, while a general scale allows comparison of QoL across patient populations and also facilitates detection of relative effects of a disease. Previous studies have shown that both stroke patients and patients with heart failure have poorer QoL compared to age- and sex-matched populations (Lukkarinen & Hentinen 1997, Ones *et al.* 2005). Both heart failure and stroke are of vascular origin; they affect mainly the same age group and have consequences for the future life of the patients. These common characteristics of the diseases underlie the choice of groups for the comparison.

In this study of patients with heart failure and patients with aphasia after stroke, we used a non-disease-specific questionnaire to compare the impact on QoL of these diseases that has previously been used in studies of patients with stroke or heart failure (Cline *et al.* 1999, Buck *et al.* 2000, Ones *et al.* 2005). The aims of this study were to describe the impact of the disease on QoL in patients with heart failure and in patients affected by aphasia after stroke and to compare the different domains of QoL in these two groups of patients.

Methods

Participants and study design

This research is part of two studies on patients with heart failure and patients with aphasia after stroke. In these studies, the Nottingham Health Profile (NHP) was administered to measure perceived QoL. The patients with heart failure consisted of 79 out of 208 patients from a randomised controlled trial of patients hospitalised with heart failure between 1996 and 1999 described by Mejhert *et al.* (2004). Only patients with newly diagnosed heart failure who had answered the NHP questionnaire in the acute phase and/or after six months were included in the current analysis, which explains the number of 79 included patients out of 208. In the group of aphasic stroke patients, 70 out of 89 participants from a randomised controlled trial of intensive speech therapy after stroke, between 2002 and 2007, were included (Laska *et al.* 2008), that is those who completed the NHP questionnaire either at baseline or after six months, or at both occasions. Fifty-six stroke patients completed the question-

naire at baseline, 51 after six months and 37 at both occasions. Among the patients with heart failure, the corresponding numbers were 77, 71 and 69.

Both studies were conducted at the same hospital, and the same QoL instrument was used for these two groups of patients with chronic disease of vascular origin. Both groups were evaluated in the acute stage and after six months.

Instruments and data collection

Background data concerning age, gender and marital status were collected at study entry. Severity of disease in patients with heart failure was classified according to the New York Heart Association (NYHA) class I-IV (The Criteria Committee of the New York Heart Association 1973). Patients in NYHA class I have no physical limitations. In NYHA class II, patients have slight limitations of physical activity and in NYHA class III, they have marked limitations. Patients in NYHA class IV are unable to carry out physical activity without discomfort. Aphasia was measured with 'Norsk Grunntest for Afasi' (NGA) (Reinvang 1985), to assess the type and degree of aphasia. This test is based on the Boston terminology and similar to the Western Aphasia Battery (Kertesz 1982) and measures fluency, naming, comprehension and repetition, as well as writing and reading. The sum of the total scores for the main variables yields the aphasia coefficient that measures the degree of aphasia.

The Nottingham Health Profile questionnaire

In this study, part I of the NHP questionnaire has been used that consist of 38 statements falling into six domains; physical mobility (eight items), sleep (five items), energy (three items), pain (eight items), emotional reactions (nine items) and social isolation (five items). Within the domains, each statement is weighted for severity and the maximum score for each domain is 100. The total score is the sum of all domains per patient divided by six, resulting in a maximum score of 100 (Hunt *et al.* 1980). Part II of the questionnaire consists of seven questions concerning the impact the health condition has had on ability to work, housekeeping, social activities, family life, sexual life, leisure activities and vacation. This part has not been analysed in this article.

Validity and reliability

Measuring QoL in aphasic stroke patients is complicated as respondents need to read and understand the questionnaire (Cruice *et al.* 2005). The construction of the NHP, with yes/no answers, is simple and has been found to be suitable, reliable and valid in patients with cognitive dysfunction (Baro

et al. 2006). Most patients with aphasia appear to be able to make reliable and valid responses to QoL assessments in face-to-face interviews (Cruice *et al.* 2000). Patients from both groups may have had assistance from relatives in filling out the questionnaire and only those who returned a completed form were included in the study. Test of internal consistency reliability of the NHP questionnaire, measured with Chronbach's alpha coefficient, was 0.81–0.87 in this study.

Ethical considerations

Written informed consent was obtained from the participating stroke patients if possible. If the patient were unable to sign the form, their relatives were asked to sign instead of the patient. Oral consent was given by the participants with heart failure. At time of inclusion in this study, written consent was not mandatory. The studies were approved by the Ethics Committee at the Karolinska Hospital (Dnr 02-111 and 95-207) and complied with the Declaration of Helsinki.

Statistical analysis

Descriptive statistics were used to analyse demographic data. Mean values and SD are reported for the different domains and for the total score of the NHP. Chi-square was used to compare categorical variables; the Mann–Whitney *U*-test was used to compare QoL scores in patients with heart failure and stroke and between NYHA class II and III and QoL in the acute stage. Kruskal–Wallis was used to compare NYHA class I, II and III and QoL after six months. Wilcoxon signed ranks test was used to analyse change over time; $p < 0.05$ was considered as statistically significant. All statistical analyses were performed with the Statistical Package for Social Sciences (SPSS) version 15.0 for Windows.

Results

Demographic data are shown in Table 1. There were no significant differences between patients with heart failure and patients with stroke and aphasia concerning age, gender,

Table 1 Demographic data

	Aphasic stroke patients $n = 70$	Patients with heart failure $n = 79$
Mean age (SD)	74.6 (11.8)	74.7 (6.7)
Male gender, %	49	54
Married, %	59	51

marital status or level of education. In both groups, male patients were more likely to be married (heart failure $p < 0.001$, stroke $p < 0.05$). Also, there were no significant differences between patients with newly or previously diagnosed heart failure regarding age, gender or marital status.

The severity of disease in patients with heart failure, assessed by the NYHA classification, improved between the acute phase and six months ($p < 0.01$). In the acute phase, there was no correlation between NYHA class and the domains in NHP, but after six months, all domains were significantly correlated to the NYHA class. There were no subjects in NYHA class I or IV at baseline, but after six months, 21 patients were classified to NYHA class I. Patients in NYHA class III were those who were most negatively affected in the domains of mobility, energy, social, emotional and in the total score ($p = 0.01$). In the domains of sleep and pain ($p < 0.05$), patients in NYHA class II were most affected. Among patients with heart failure, an improvement between the acute phase and six months was seen in mobility and emotional status ($p < 0.05$) and in sleep, energy and total score of the NHP ($p < 0.01$), based on the 69 patients that were assessed in both the acute phase and after six months.

In stroke patients, the degree of aphasia in the acute phase was significantly correlated to pain ($r = -0.30$, $p < 0.05$) and to mobility, social, emotional and total scores ($r = -0.46$, -0.37 , -0.37 and -0.35 , respectively; all $p < 0.01$). After six months, there were still significant correlations in the social and emotional domains ($r = -0.36$ and -0.36 , respectively; $p < 0.05$) and in mobility and the total score ($r = -0.60$ and -0.40 , respectively; $p < 0.01$). Improvement in both functional status and degree of aphasia were seen during the six-month follow-up period ($p < 0.001$). In aphasic stroke patients, there was an improvement in mobility between the acute phase and six months ($p < 0.05$), based on the 37 patients who participated in both assessments.

Results of the analyses of mean values of six domains and the total score of the NHP for the two groups are shown in Table 2. There were significant differences in the acute phase in sleep and energy where patients with heart failure were more affected than stroke patients ($p < 0.05$ and $p < 0.01$ respectively) (Fig. 1). After six months, energy remained lower in patients with heart failure ($p < 0.05$) (Fig. 2).

Analyses of gender differences in patients with heart failure revealed differences in mobility, sleep and total score after six months ($p < 0.05$). Women were at all occasions more affected than men (Table 3). No differences were found between men and women in the stroke group.

Table 2 NHP mean values (SD) for aphasic stroke patients and patients with heart failure at the acute stage and after six months

	Mobility	Sleep	Energy	Pain	Social	Emotional	Total
Aphasic stroke patients Baseline <i>n</i> = 56	34.8 (34.1)	20.8 (28.4)	30.8 (31.4)	13.0 (23.5)	14.6 (22.0)	16.1 (22.3)	21.7 (20.5)
Aphasic stroke patients 6 months <i>n</i> = 51	31.8 (32.4)	16.4 (24.8)	20.6 (29.0)	10.3 (14.7)	14.3 (20.8)	11.8 (17.8)	17.5 (16.6)
Patients with heart failure Baseline <i>n</i> = 77	24.7 (23.4)	31.3 (33.7)	49.6 (37.8)	12.9 (20.6)	10.1 (19.8)	19.4 (24.9)	24.7 (20.8)
Heart failure patients 6 months <i>n</i> = 71	19.7 (20.7)	18.8 (22.0)	35.9 (37.2)	10.5 (17.6)	10.5 (18.8)	12.3 (18.8)	18.0 (16.7)

NHP, nottingham health profile.

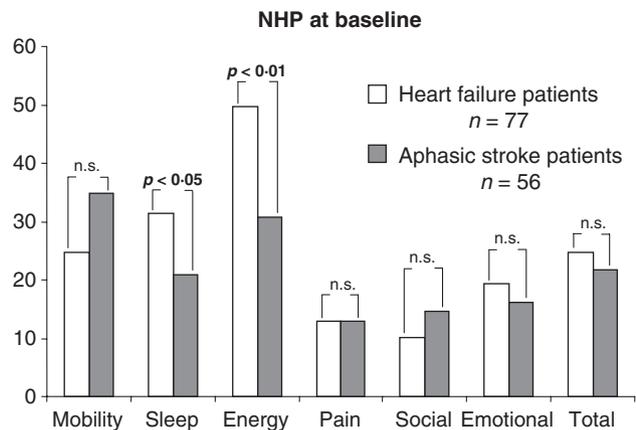


Figure 1 Differences in quality of life (QoL) between patients with heart failure and patients with aphasia after stroke in the acute phase. (Mann–Whitney *U*-test).

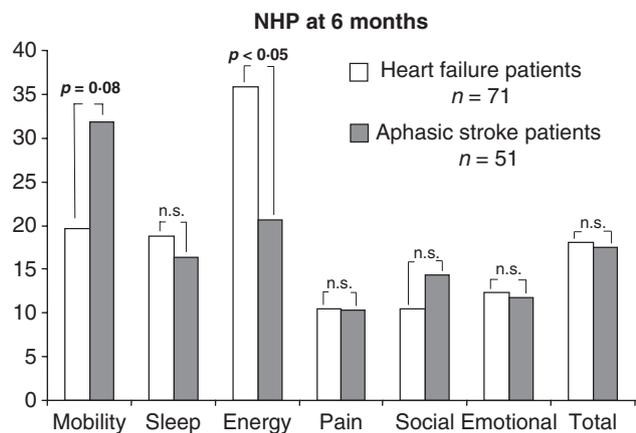


Figure 2 Differences in quality of life (QoL) between patients with heart failure and patients with aphasia after stroke after six months. (Mann–Whitney *U*-test).

Discussion

The NHP questionnaire is a simple and reliable instrument that can easily be implemented in clinical use as a screening instrument aiming at identifying patients at risk for adverse effects on QoL. It is also suitable when comparing the impact

on QoL of different diseases. Although subjective, it can be used as a prognostic instrument for predicting risk of readmission for patients with heart failure (Mejhert *et al.* 2006). In this comparison between patients with heart failure and patients with aphasia after stroke, we found that QoL was more affected in patients with heart failure in the domains of sleep and energy in the acute phase and in the energy domain after six months.

Patients with stroke have an acute onset and no previous symptoms. In this study of selected patients, the heart failure patients improved in NYHA-class at six months compared to baseline. The initial treatment at the hospital, effective medication and rehabilitation are likely to explain this improvement. Patients in NYHA class III were more affected in all domains of their QoL, except pain and sleep, than those with less severe heart failure. This indicates that a more advanced disease results in a poorer QoL.

Patients with heart failure improved their QoL in all domains, except pain and social isolation between the acute phase and six months, while an improvement was only seen in the mobility domain for the aphasic stroke patients. In part, this might be explained by the heart failure patients' adjustment to symptoms as they often have been ill for some time before seeking medical care.

Among the stroke patients, there were significant correlations between degree of aphasia and the social, emotional, mobility and total scores of QoL at six months. Significant improvements in both aphasia and physical function were seen between the acute phase and six months, but this did not result in a perceived better QoL, except in the mobility domain. This suggests that among aphasic stroke patients, there are other facets than severity of aphasia that affects the perceived QoL. This support the findings of Ross and Wertz Ross & Wertz (2002, 2003), who found that decreased QoL in chronically aphasic stroke patients was not closely related to language-based disablement.

There was a tendency for the aphasic stroke patients to be more negatively affected in the domains of mobility and social isolation, both in the acute phase and after six months. A survey conducted by the National Aphasia Association (Lapointe 1999) found that 90% of the patients felt they were

Table 3 NHP comparison between men and women at baseline and six months (heart failure patients) (Mann–Whitney *U*-test)

	Mobility	Sleep	Energy	Pain	Social	Emotional	Total
Baseline							
Men (<i>n</i> = 43)	21.9	26.3	44.6	13.8	8.8	18.5	22.3
Women (<i>n</i> = 34)	28.4	37.5	56.0	11.7	11.7	20.67	27.7
6 months	<i>p</i> < 0.05	<i>p</i> < 0.05					<i>p</i> < 0.05
Men (<i>n</i> = 38)	15.4	12.8	30.6	8.7	8.4	10.4	14.4
Women (<i>n</i> = 33)	24.7	25.7	42.1	12.6	12.8	14.5	22.1

NHP, nottingham health profile.

socially isolated. Interestingly, there was no difference compared to patients with heart failure. This indicates that both groups of patients are affected by social limitations that need to be considered when planning for future care.

Men and women did not differ in the severity of their diseases. Nevertheless, women with heart failure had a poorer perceived QoL score. This confirms the previous findings of gender differences in patients with heart failure (Friedman 2003, Emery *et al.* 2004). Similar gender differences have been shown in stroke patients (Hochstenbach *et al.* 2001, Gray *et al.* 2007). However, in our study, the QoL was similarly affected for male and female stroke patients. Whether this is a random finding in a relatively small sample will need further studies.

Strengths and limitations

The use of validated and reliable instrument as the NHP, which has been widely used in both patient groups, makes our comparison reliable. An important limitation of this study is that the participating patients were only those who were able to fill out the NHP questionnaire. Thus, those more affected by their disease and possibly with a more negative impact on their QoL could not be assessed. However, this was the same for heart failure and aphasic stroke patients and should not influence the comparison between the groups. Another limitation is the relatively small number of participants, and that the data collection for the two groups was not performed simultaneously.

Conclusion

In conclusion, patients hospitalised with heart failure and patients with aphasia after stroke report low QoL. Aphasic stroke patient's experience of social isolation is recognised from previous studies. However, patient with heart failure seems to be as negatively affected as the aphasic stroke patient. Perceived low energy is more frequently reported among patients with heart failure. Improvement in the severity of the disease is not necessarily accompanied by improvement in QoL. This needs to be considered when

planning for future care of the patient. Awareness about the impact these chronic diseases have on patients' QoL can promote effective measures to facilitate the situation of these patients.

Relevance to clinical practice

NHP can easily be implemented in clinical practice and used as a screening instrument aiming to identify patients at risk for adverse effects on QoL. A better understanding of the subjective QoL of patients with chronic disease is fundamental for health care professionals to be able to identify and support vulnerable patients.

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Contributions

Study design: ÅF-D, MR-K, MM, A-CL; data collection and analysis: ÅF-D, MR-K, MM, A-CL and manuscript preparation: ÅF-D, MR-K, MM, A-CL.

Conflict of interest

None of the authors have any conflict of interest.

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