

Assessment of Quality of Life in Patients with Heart Failure in Relation to Severity of the Clinical Features

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Background. Heart failure is a common disease that requires frequent and long hospitalizations, the active participation of health workers and family members in the care of such patients, and it leads to reduction of physical activity and lifestyle changes with the patient, which significantly affects the quality of life of patients with heart failure.

Aim. To determine the quality of life of patients with heart failure in relation to severity of the clinical features.

Methods. Analysis of life quality was performed for 120 patients suffering from heart failure, both genders, all age groups in relation to severity of the clinical features. Patients were divided into 4 groups according to NYHA classification of heart failure. The control group consisted of 10 subjects who do not suffer from heart failure. Assessment of quality of life was performed using the SF-36 questionnaire which consists of 8 segments classified in the dimension of physical and mental health.

Results. Study group consisted of 130 participants with heart failure had 66 (51%) of male, and other were females, divided into 4 NYHA groups, where every group had 30 subjects (23.1%), and one control group of 10 subjects (7.7%). The analysis of gender and age distribution within the groups found no statistically significant difference ($\chi^2=1.70$; $df=4$; $p=0.79$), (ANOVA; $F=0.74$; $p=0.57$). The values of SF-36 score expressed as the median in the control and 4 NYHA groups were decreasing as the functional class progressed. The Spearman Correlation Coefficient showed that there is a strong negative correlation between the scores of SF 36 (total, segments and dimensions) and heart failure expressed through the NYHA classes.

Conclusion. Quality of life in patients with heart failure was exacerbated and associated with severity of the clinical features.

Keywords. heart failure, quality of life, sf-36 questionnaire

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Competing interests

The authors declare no competing interests.

INTRODUCTION

Heart failure is defined as a syndrome that manifests as an inability of the heart to receive or extract blood due to structural or functional cardiac damage.[1] It is also defined as a clinical syndrome characterized by inadequate systemic perfusion to meet metabolic demands of the body, as the result of impaired cardiac pump function.[2] The most important clinical manifestations of heart failure syndrome are dyspnea, paroxysmal nocturnal dyspnea, orthopnea, intolerance of physical exertion, feeling of fatigue and edema.[3] Acute heart failure is the term used for acute (cardiogenic) dyspnea, characterized by signs of pulmonary congestion, including pulmonary edema. However, acute heart failure may be also related to the cardiogenic shock, a syndrome characterized by low blood pressure, oliguria and cold peripheral parts of the body, which must be distinguished from pulmonary edema.[4] Usually this occurs suddenly, e.g. by extensive myocardial heart-attack due to function fall-out of the

large heart muscle mass, or due to sudden volume load caused by acute mitral or aortic regurgitation (papillary muscle rupture or aortic cusp), and for the right heart in acute pulmonary embolism.[5] Chronic heart failure is the most common form of heart failure, often accompanied by acute deterioration, i.e. chronic heart failure can be acutely decompensated with clinical signs of acute cardiac insufficiency. Most often it develops gradually, initially may be latent, and later it is manifested by symptoms and signs of pulmonary and systemic congestion. Diagnosis of heart failure is determined on the basis of symptoms, clinical signs and additional diagnostic procedures (lab tests, electrocardiogram, skiagraph chest, echocardiography, ergometric test, Holter monitoring, microcatheterisation of the right heart, catheterisation of the heart and coronarography, radionuclide ventriculography and neurohormonal diagnostics. To establish a correct diagnosis, into account must be taken and other than heart disease, especially in older patients with multiple diseases simultaneously.[6] After

Table 1. The average values of SF-36 scores within the analyzed groups in patients with heart failure (Kruskal-Wallis; $H_t=116.84$; $p<0.0001$)

Group	n	Median	SD	Interquartile range
Control group	10	98.6	0.00	N/A
NYHA I	30	90.76	4.51	87.36-94.72
NYHA II	30	70.14	10.64	65.27-76.38
NYHA III	30	36.45	9.52	30.00-43.33
NYHA IV	30	25.41	5.91	21.25-29.16

NYHA- New York Heart Association classification of heart failure; N/A – not applicable because quartiles are identical to the median.

Table 2. Average values of the physical health dimension SF-36 within the analyzed groups of patients with heart failure. (Kruskal-Wallis; $H_t=117.28$; $p<0.0001$)

Group	n	Median	SD	Interquartile range
Control group	10	100.0	0.00	N/A
NYHA I	30	88.09	6.00	83.33-94.04
NYHA II	30	67.85	10.31	61.90-71.41
NYHA III	30	36.90	9.10	28.57-44.04
NYHA IV	30	21.42	6.04	17.85-25.00

NYHA- New York Heart Association classification of heart failure; N/A – not applicable because quartiles are identical to the median

Table 3. Average values of the mental health dimension SF-36 within the analyzed groups of patients with heart failure. (Kruskal-Wallis; $H_t=104.54$; $p<0.0001$)

Group	n	Median	SD	Interquartile range
Control group	10	100.0	0.00	N/A
NYHA I	30	95.18	4.50	90.71-98.21
NYHA II	30	76.42	14.63	69.28-86.07
NYHA III	30	38.57	15.41	31.07-45.35
NYHA IV	30	29.28	10.94	26.07-38.21

NYHA- New York Heart Association classification of heart failure; N/A – not applicable because quartiles are identical to the median.

diagnosing heart failure condition, it is also important to assess a severity of clinical features. Symptoms of the disease can be used for classification of severity of heart failure and may serve as indicators of the therapy effect. Today, for the purposes of the heart failure classification, revision of the New York Heart Association (NYHA) classification has been used. The new revision of NYHA classification also takes into account objective indicators of cardiovascular system.[4] Heart failure therapeutic approach consists of general measures, pharmacological therapy, application of various devices and surgical interventions. These methods, while respecting individual approach to each patient, imply

the impact on prevention, morbidity and mortality. The primary goal of treatment of patients with heart failure is prolongation of life expectancy and improvement of quality of life. According to the World Health Organization quality of life is defined as the perception of the individual's role in the context of culture and values in which they live and in relation to its objectives, expectations, standards and concerns. It is a complex concept that includes physical health, psychological state of a person and the degree of independence, social relationships, personal beliefs and relation toward essential features of the environment (Anonymous, 1996). Quality of life was identified as a predictor of

Table 4. Spearman correlation coefficient between heart failure expressed in NYHA classes and total score of SF-36, its physical and mental dimensions

		SF-36	SF physical health dimension	SF mental health dimension
Heart failure	Correlation coefficient - r	-0.950	-0.953	-0.890
NYHA classes	p-value	<0.0001	<0.0001	<0.0001

hospitalization and mortality in elderly with heart failure.[7] Heart failure condition requires from patients their daily responsibility and concern for their health through compliance to various guidelines within the framework of everyday life: taking the recommended therapy, moderate physical activity, nutrition restriction of salt and fat, fluid intake restriction, prohibition of alcoholic beverages, no smoking and frequent control of cardiologist.[8] Survival of patients with heart failure is increasing due to new therapeutic measures that stabilize and maintain the patient, but improvement of patients comfort in the remaining period of life is required. Prolongation of life without these commodities can be observed as less important goal.[9] Hobbs and associates[10] showed that patients with heart failure have significantly reduced all aspects of quality of life, and not only physical functioning. Juenger and associates[11] showed in their study, where the sample was 205 patients suffering from heart failure, that the quality of life significantly decreased with increasing NYHA classification. The above mentioned studies suggest the disturbance of quality of life, and they point out the importance of assessment. Routine use of tests which examine the quality of life can help to identify changes that need additional help in improving the quality of life.[11] Taking into account the high prevalence, the vast costs of health funds to treat patients, frequent hospitalization and more demanding participation of both physicians and families in the care of these patients as well as negative impact on quality of life, heart failure represents one of the most significant health problems in all countries of the world. The aim of this study was to determine the quality of life of patients with heart failure in relation to the severity of clinical features.

METHODS

The analysis is based on the population of patients with previously diagnosed heart failure, who were hospitalized and ambulatory treated at the Clinic for Internal Medicine of University Clinical Center in Tuzla, Bosnia Herzegovina, during 2010. Using sectional study we analyzed 120 patients suffering from heart failure, all ages and both sexes. Patients were divided into 4 groups according to NYHA classification of heart failure. The control group consisted of 10 subjects who do not suffer from heart failure, all ages and both sexes. The study excluded patients who in addition to heart failure have diagnosed psychiatric, malignant or other serious disease that can significantly affect the qual-

ity of life. During this research, socio-epidemiological anamnesis has not been taken, nor information about the etiology, duration of heart failure or therapy of the subjects, and also biochemical parameters were not monitored.

Assessment of quality of life was performed using the SF-36 health status questionnaire, which consists of 36 questions[12] grouped into eight dimensions: physical functioning, limitation due to physical difficulties, limitations due to emotional difficulties, social functioning, mental health, vitality and energy, bodily pain, perception of general health. These eight areas are grouped into two dimensions: physical and mental health. The total score was calculated using the microcomputer program (SF-36.EXE) and it can be from 0 to 100 points, or bad to excellent quality of life.[13] Scale was completed by the examiner. The research was approved by the Ethics Committee of the JZU Univerzitetski klinicki centar Tuzla.

STATISTICAL ANALYSIS

Statistical analysis was made by program pack SPSS 18.0 (Chicago, IL, USA). Basic tests of descriptive statistics were made, showing measures of central tendency and dispersion. Testing of each variable for belonging to a normal distribution was performed, using Kolmogorov-Smirnoff test. Quantitative variables were compared by one-way ANOVA test on the same place where these has been distributed by a normal distribution. For variables that were not distributed by the normal distribution was used nonparametric alternative – Kruskal-Wallis test. Categorical variables were analyzed by X2-test. Testing significant connections between variables was performed using Spearman non-parametric correlation. Uni-variant and multi-variant linear regression analysis was used to test the predictive potential of individual variables on the value of SF-36. All statistical tests were carried out with the level of statistical probability of 95% ($p < 0.05$). Analysis of the reliability of SF-36 test on the evaluated sample was performed. Total score value and individual segments were analyzed. It was shown that the test had a high level of reliability with Cronbach alpha coefficient of 0.985.

RESULTS

Study group consisted of 130 participants with heart failure had 66 (51%) of male, and other were fe-

Table 5. Spearman correlation coefficient between heart failure expressed in NYHA classes and value of eight subunits in SF-36 score

	physical functioning	limitation due to physical difficulties	limitations due to emotional difficulties	vitality and energy	mental health	social functioning	bodily pain	perception of general health
Heart failure	-0.953	-0.884	-0.821	-0.905	-0.844	-0.827	-0.921	-0.814
Correlation coefficient - r								
NYHA classes	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

males, divided into 4 NYHA groups, where every group had 30 subjects (23.1%), and one control group of 10 subjects (7.7%). The analysis of gender representation within the groups showed that in the control group was equal representation of men and women, in NYHA class I males were underrepresented (43.3%) than women (56.7%), while in NYHA class II distribution was reversed, in NYHA class III women's representation (53.3%) was higher than men (46.7%), and at NYHA class IV results were identical to the gender distribution of NYHA class II. There were no statistically significant differences in gender representation ($\chi^2=1.70$; $df=4$; $p=0.79$) between analyzed groups. Distribution of respondents by age was analyzed and it showed that the most common one was the age group of 71-75 years (22.3%), while the least represented were respondents aged 41-45 years (3.1%) and respondents over 80 years (3.8%). Representation in other age groups was: age 46-50 (4.6%), age 51-55 (9.2%), age 56-60 (13.8%), age 61-65 (11.5%), age 66-70 (17.7%) and age 76-80 (13.8%).

The mean age of the respondents were: the control group 69 years, patients in NYHA class I 64 years, in NYHA class II 66 years, in NYHA class III 68 years and NYHA class IV 70 years. There was no statistically significant difference in age between the groups (ANOVA; $F=0.74$; $p=0.57$). The value of SF-36 scores by gender was ranged from 16 to 98.6. The average value of the SF-36 score for men was 60, and 64 in women. There was no statistically significant differences in the value of SF-36 scores between males and females (Mann Whitney; $Z=1.01$; $p=0.31$). Table 1 shows the values of SF-36 score in patients with heart failure compared with the experimental group, the values in Table 2 dimensions of physical health SF-36, and Table 3 values of mental health dimensions SF-36. Table 4 shows the correlation of heart failure expressed in NYHA classes by value of total SF-36 score and its physical and mental dimensions, and Table 5 shows correlation of heart failure expressed in NYHA classes and the eight dimensions of SF-36 score.

DISCUSSION

In our study, the influence of heart failure on quality of life was closely related to the severity of clinical features. Specifically, the quality of life was statistically worse as functional class progressed, i.e. the negative and statistically significant correlation between NYHA class and the parameters of SF-36 score was determined, while the difference was not statistically significant between male and female. Respondents, as well as patients within control group, were elder patients. Comparing the mean of physical and mental health dimensions measured by SF-36 survey it was observed that the values of the physical dimensions of health are lower in all four NYHA class compared to the mental health dimension. Studies of other authors who have used the same measurement instrument for assessing quality of life as in our study, showed also significant correlation between severity of clinical forms of the heart failure classified according to the NYHA classification and the quality of life.[7,10] Gott and associates[7]

used the SF-36 survey, and proved that the quality of life of elder patients with heart failure is significantly compromised, and that the impact of disease on the physical dimension of health is more pronounced. Also, Parajon and associates[14] suggest larger disturbance of physical compared with mental health dimension in patients with heart failure. Our results indicate that, with increasing NYHA classification group in patients with heart failure, a decline in overall quality of life as well as in physical and mental dimensions starts to occur, as indicated by Juenger and associates[11] in their study. Obviously, the results indicate that the solution of problems related to quality of life of patients with heart failure should be considered timely. Heart failure is the chronic outcome of many cardiovascular disorders and it represents disease with a poor prognosis. Impaired health status and course of the disease can lead to mild or dramatic changes in some or all of the determinants of quality of life, with complex interactions between disease and treatment, as well as it can also lead to individual patient response to the social environment.[15] So, as it is required to assess quality of life in patients with most chronic diseases, it is also necessary to perform same assessment in patients with heart failure so that the problem can be observed timely and a comprehensive and multidisciplinary approach provided to these patients, in order to achieve a sense of well-being, satisfaction and happiness i.e. a better quality of life. Thanks to new therapeutic measures to stabilize and maintain stability of patient, a longer life-time period of patients with heart failure has been achieved, but it is necessary to improve the comfort i.e. the quality of life for the remaining period of living.

CONCLUSION

Quality of life in patients with heart failure has exacerbated, with the dominant impairment of physical dimensions of health. Influence of heart failure on quality of life is closely related to the severity of clinical features in elder patients, regardless of gender. Heart failure requires responsibility from patients as well as care for their health through a variety of guidelines and restrictions in daily life, which significantly affects the quality of life. Timely assessment of the quality of life in patients with heart failure is necessary in order to have early and proper detection of problem and to provide adequate approach to these patients, with purpose to achieve a sense of well-being, satisfaction and happiness i.e. a better quality of life.

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