

Physical activity profile in heart failure patients from a Brazilian tertiary cardiology hospital

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Abstract

Background: Physical activity (PA) has proven benefits in the primary prevention of heart diseases such as heart failure (HF). Although it is well known, HF PA habits and physicians' advice have been poorly described. The aim of this study was to investigate if physicians were advising HF patients to exercise and to quantify patients' exercise profiles in a complex cardiology hospital.

Methods: All 131 HF patients (80 male, average age 53 ± 10 years, NYHA class I–V, left ventricular ejection fraction $35 \pm 11\%$, 35 ischemic, 35 idiopathic, 32 hypertensive and 29 with Chagas disease) went to the hospital for a HF routine check-up. On this occasion, after seeing the physician, we asked the patients if the physician had advised them about PA. Then, we asked them to fill in the international physical activity questionnaire (IPAQ) Short Form to classify their PA level.

Results: Our data showed a significant difference between patients who had received any kind of PA advice from physicians (36%) and those who had not (64%, $p < 0.0001$). Using the IPAQ criteria, of the 36% of patients who had received advice, 12.4% were classified as low and 23.6% as moderate. Of the 64% of patients who did not receive advice, 26.8% were classified as low and 37.2% as moderate. Etiology (except Chagas), functional class, ejection fraction, sex and age did not influence the PA profile.

Conclusions: Physicians at a tertiary cardiology hospital were not giving patients satisfactory advice as to PA. Our data supports the need to strengthen exercise encouragement by physicians and for complementary studies on this area. (Cardiol J 2010; 17, 2: 143–148)

Key words: heart failure, exercise, adherence, rehabilitation

Introduction

Physical activity profile has long been used as a marker of health status. In some populations, exercise capacity is related to mortality and morbidity

[1, 2]. Physical activity has shown benefits in the primary prevention of chronic diseases and in the secondary treatment of heart diseases [3, 4].

Heart failure is considered to be the last stage of heart disease and is a cause of worldwide mor-

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tality and morbidity [5, 6]. It is characterized by a persistent activation of the neurohormonal system [7], endothelial dysfunction [8, 9], exercise intolerance [10–12], high mortality [13] and a poor quality of life [14].

The recommended treatment for heart failure (HF) patients is divided into non-drug and drug therapy. The non-drug treatment is based on diet, family orientation and physical activity [15]. Physical activity is a safe and well tolerated method to decrease HF symptoms, neurohormonal activity, morbidity and mortality [5]. It is also important to increase quality of life and physical capacity, making the patients better able to perform satisfactorily their daily activities [16–21].

The International Physical Activity Questionnaire (IPAQ) [22] was developed in 1998 in Geneva, Switzerland, by the International Consensus Group to evaluate physical activity level. It was validated in 2000 by 14 centers. In Brazil it was validated in 2001 [11].

The aim of this study was to evaluate the physical activity profile of HF patients and the physical activity advice given by their physicians in a tertiary cardiology hospital in Brazil. In addition, this study evaluated the influence of etiology, functional class, ejection fraction, sex and age in the physical activity profile.

Methods

Population

One hundred and thirty one patients with stable HF were recruited from a Brazilian tertiary cardiology hospital. Stability was defined as no alterations in medical therapy or change in HF symptoms for one month, and no myocardial infarction for three months. Baseline characteristics are shown in Table 1. All patients had documented left ventricular ejection fraction (LVEF \leq 45%, by echocardiography) and were on appropriate medical therapy (angiotensin-converting enzyme inhibitors, diuretics, aldosterone antagonists, digoxin, and/or beta-blockers). Patients were excluded if they had any neurological, orthopedic or peripheral vascular disease that could impair their physical activity profile.

Study design

All studied patients went to the hospital for a HF routine check-up. On this occasion, after seeing the physician, we asked the patients if the physician had advised them about physical activity. Then, we asked the patients to fill in the IPAQ Short Form for a physical activity classification [11]. All patients were instructed to be as precise and ob-

Table 1. Baseline characteristics in heart failure patients (n = 131).

	Female	Male	p
N	51	80	–
Age (years)	54 ± 11	52 ± 10	NS
LVEF (%)	35 ± 14	34 ± 12	NS
Etiology:			
Ischemic	11	24	NS
Idiopathic	18	17	NS
Hypertensive	9	23	NS
Chagas' disease	13	16	NS
NYHA class:			
I	11	33	NS
II	25	30	NS
III	15	14	NS
IV	–	3	–
Medications (%)			
ACE-inhibitor	41	64	–
Diuretic	45	71	–
Digoxin	10	16	–
Beta-blocker	60	90	–
A II	19	30	–
Amiodarone	13	8	–
Nitrates	27	17	–
Ca-blockers	25	15	–

LVEF — left ventricular ejection fraction; NYHA — New York Heart Association; ACE — angiotensin converting enzyme; A II — angiotensin II antagonists; Ca — calcium channel

jective as possible with regard to their usual mean daily physical activities. As soon as the questionnaire was answered, patients were classified by physician advice and by the three levels of physical activity (IPAQ Short Form): low, moderate and high. Individuals who did not meet the criteria for the moderate or high categories were considered to have a 'low' physical activity level.

Individuals who met at least one of the following criteria were classified as moderate: a) three or more days of vigorous-intensity activity for at least 20 min per day; b) five or more days of moderate-intensity activity and/or walking for at least, 30 min per day; c) five or more days of any combination of walking, moderate-intensity or vigorous intensity activities.

Individuals who met one of these following criteria were classified as 'high' level of physical activity: a) vigorous-intensity activity on at least three days, or b) seven or more days of any combination of walking, moderate-intensity or vigorous-intensity activities.

This protocol was approved by the Ethical Committee of the study institution. All patients provided informed consent prior to participation.

Statistical analysis

Results are given as mean ± standard deviation for continuous variables. The Kolmogorov-Smitnov test was used to check the data normality. The Mann-Whitney test was used to compare variables that did not exhibit a normal distribution. Multivariate logistic regression analysis was used to assess the ability of sex, age, New York Heart Association (NYHA) functional class and LVEF to influence a patient’s physical profile. Data was analyzed using Statistical Package for Social Sciences (SPSS) for Windows, v. 11.5 (SPSS Inc, Chicago, IL, USA). Statistical significance was $p < 0.05$.

Results

Our data showed a significant difference between patients who had been given any kind of physical activity advice by physicians (36%) and those who had not (64%, $p < 0.0001$). Using the IPAQ criteria for physical activity, of the 36% of advised patients, 12.4% were classified as low and 23.6% as moderate. From the 64% of patients who did not receive advice, 26.8% were classified as low and 37.2% as moderate. None of the studied patients were classified as high intensity level of physical activity.

Functional class

There was no significant difference in the NYHA functional classification between low and moderate intensity of physical activity profile (Table 2). Neither was there any significant difference between the advised and the non-advised group about physical activity (Table 3). NYHA functional class did not influence the patient’s physical activity profile (Table 4).

Etiology

There was no significant difference between low and moderate physical activity profile, except for those with Chagas disease (Table 2). There was also no significant difference between the advised and the non-advised group about physical activity, except for those with Chagas (Table 3).

Left ventricular ejection fraction

There was no significant difference between low and moderate physical activity profile (Table 2). There was also no significant difference between the advised and the non-advised group about physical activity (Table 3). LVEF did not influence the patient’s physical activity profile (Table 4).

Table 2. International Physical Activity Questionnaire in heart failure patients (n = 131).

	Low	Moderate	High	p
Sex:				
Female	24	27	–	NS
Male	27	53	–	NS
Etiology:				
Ischemic	17	18	–	NS
Idiopathic	16	19	–	NS
Hypertensive	11	21	–	NS
Chagas’ disease	7	22	–	0.03
NYHA class:				
I	12	32	–	NS
II	23	32	–	NS
III	16	13	–	NS
IV	–	3	–	–
LVEF ≤ 45%	51	80	–	–
Physical orientation:				
Yes	24	27	–	NS
No	27	53	–	NS

NYHA — New York Heart Association; LVEF — left ventricular ejection fraction

Table 3. Physical activity orientation in heart failure patients (n = 131).

	Yes	No	p
Sex:			
Female	21	30	NS
Male	26	54	NS
Etiology:			
Ischemic	16	19	NS
Idiopathic	12	23	NS
Hypertensive	10	22	NS
Chagas’ disease	9	20	0.03
NYHA class:			
I	19	25	NS
II	18	37	NS
III	7	22	NS
IV	3	–	–
LVEF ≤ 45%	47	84	–

NYHA — New York Heart Association; LVEF — left ventricular ejection fraction

Sex

Men had a greater physical activity level than women, but both sexes received poor advice about physical activity. Sex did not influence the physical activity profile (Table 2–4).

Table 4. Multivariate logistic regression analysis to physical profile.

Variables	χ^2	p
Sex	2.672	0.102
Age	0.368	0.544
NYHA	3.038	0.081
LVEF	0.441	0.507
Total	7.010	0.220

NYHA — New York Heart Association; LVEF — left ventricular ejection fraction

Age

There was no significant distribution among low and moderate physical activity levels in the ranges of age 19 to 40 years (16 patients), 41 to 60 years (80 patients) and > 60 years (35 patients). Age did not influence the patient’s physical activity profile (Table 4).

Discussion

The aim of this study was to check if HF patients were advised by physicians to exercise, and to study the level of physical activity of the advised and non-advised groups. We found that physicians at a tertiary cardiology hospital did not advise patients satisfactorily to perform physical activities. This goes against accepted worldwide advice. Our results suggest that physicians’ treatment profiles are almost entirely characterized by the prescription of drugs to improve symptoms. None of the studied patients had a high intensity physical activity profile, and only a few had a moderate profile.

A modern cardiovascular rehabilitation program provides lifestyle intervention, encouraging patients to stop smoking, to eat healthy food, to maintain a healthy body weight and to increase their exercise capacity. Finally, physicians ensure appropriate prescribing and compliance with cardio-protective drug therapies.

A previous study showed that global indicators of physicians’ adherence to guidelines treatment were associated with decreased rates of HF complications and delayed re-hospitalization [23].

This is the first study to evaluate physical activity profile of HF patients in a tertiary cardiology hospital. Physical capacity and daily exercises are important to clinical outcomes in any chronic disease [24, 25]. These daily exercises are effective in HF treatment, particularly when the drug therapy is optimized. In this context, exercise therapy does not

represent a paradigm change; but rather the accumulated knowledge is now so extensive that it is obligatory to implement it in HF treatment [13].

Patients with heart disease are, naturally, concerned about the appropriate intensity of exercise and its safety. A moderate training level improves functional capacity and provides long-term adherence. Physical activity can be quantified in terms of METs (metabolic equivalents), where one MET (3.5 mL O_2 /kg/min) represents the rate of oxygen consumption by a normal average adult at rest [26]. Physical activity can also be categorized as light (< 4 METs), moderate (4 to < 6 METs), and vigorous (> 6 METs). Moderate intensity activities burn almost 150 Kcal daily or 1,000 Kcal weekly [27]. Therefore, sedentary patients should be encouraged to increase their physical performance, exercising with a light to moderate intensity, expending 1,000 to 1,500 Kcal per week, which can be accomplished by a daily walk [28, 29].

The U.S. Center for Disease Control and Prevention and the American College of Sports Medicine recommend at least 30 min of moderate intensity physical activity per day on most days of the week. No data exists concerning the prognostic implications of different intensities or duration training in HF patients. However, the evidence suggests that regular physical activity can favorably influence the prognosis [30].

Our data showed that 86% of the studied HF patients performed physical activity less than 150 min in a week. A similar result (84 to 93%) was observed in a healthy population in Latin America, in contrast to a European healthy population (57%) [31]. However, participation in physical activity programs is influenced by social experiences and cultural values. It is an important consideration when planning exercise programs for specific ethnic groups [32, 33]. Appropriate forms of exercise may contribute to better adherence [34, 35].

Physical inactivity is pervasive: more than 60% of women and men do not engage in the recommended amount of physical activity, and 25% are not active at all [36]. Similar levels of inactivity were observed in our study. This is particularly unfortunate in HF patients, because physical activity is safe, effective and associated with a better survival and quality of life. Physical activity should be part of the standard treatment of HF.

A study showed that an increase of 1% in the physical activity level was enough to improve quality of life, decrease hospitalizations and medical costs (estimated US\$ 7 million) [37]. After the beginning of a physical activity motivation program in

a large number of sedentary people, there was an increase of 8% of men, and 5% of women, participating [18]. However, our study showed that, even after a physician advises physical activity, most patients do not perform any kind of exercise.

Limitation of the study

This study was limited by the use of an indirect measure of physical activity. No physiological or exercise measuring devices were used. No confirmatory sources (such as family contact) were used to validate self-reported activity levels either. Patients were interviewed only once, after their physician's appointment.

Conclusions

Physicians did not advise their patients satisfactorily to perform physical activities in a tertiary cardiology hospital in Brazil. Etiology (except those with Chagas disease), functional class, ejection fraction, sex and age did not influence the physical activity profile. Our data supports the necessity of strengthening exercise encouragement by physicians.

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