A Comparison of One-Year Outcome in Adult Patients with Heart Failure in Two Medical Setting: Heart Failure Clinic and Daily Physician Practice

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Objective: *To compare between adult patients with heart failure after hospital discharge in a heart failure clinic and daily practice in terms of survival, readmission rate, and quality of life.*
Material and Method: *The authors followed 100 patients who received care in the heart failure clinic (n = 50) or the usual care (n = 50) for twelve months.*
Results: *During follow-up, patients in the heart failure clinic group had fewer readmissions (12 vs. 23; p = 0.04). There were eight deaths in the control group and seven deaths in the heart failure clinic group (p = 0.45). At the end of the present study, mean left ventricular ejection fraction, mean distance of 6-minute walk test, and mean quality of life scores in the treatment group improved more than in the control group (p = 0.038; 0.032; 0.048, respectively).*
Conclusion: *The heart failure clinic reduces hospital readmission and improves cardiac function and quality of life for heart failure patients.*

Keywords: *Exercise test, Heart failure, Patient readmission, Quality of life, Stroke volume, Survival, Ventricular function, Left, Walking*

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Heart failure (HF) is increasingly recognized as a major public health problem in the world[1-5]. Despite advances in the management of heart failure over the last two decades, the prognosis of these patients remains grim[6,7]. The complexity and burden of HF have led to the development of disease programs[8,9]. Recent systemic review has shown that multidisciplinary interventions can enhance care of patients with heart failure[10]. A heart failure clinic is one of the effective methods to improve quality of life, reduce re-hospitalization and mortality rate.

The objective of this present study is to compare between adult patients with heart failure after hospital discharge in terms of survival, readmission rate, and quality of life in a heart failure clinic and a physician practice.

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Material and Method

Study population

Patients were recruited from hospitalized patients with congestive heart failure and left ventricular systolic dysfunction (LVEF < 40%) in Chest Disease Institute between October 2004 and May 2007. They were randomized to two settings, 50 cases of heart failure clinic and 50 cases of conventional care. Patients were excluded from the present study if they had preserved left ventricular systolic function or if they had major valvular heart disease that required surgical correction. All patients provided written informed consent.

Interventions

The HF clinic consisted of comprehensive education of the patients and family, a prescribed diet, a review of medications and intensive follow-up for 1 year. During follow up, patients and their relatives had

a consultation with the physician about basics of HF, clinical presentation, and non-pharmacological measures (dietary restriction, daily fluid intake, weight monitoring, physical activity, and life style changes). Appointments were scheduled according to the clinical presentation and need for titration of the drugs.

The control group was defined as any management outside the HF clinic. All of the patients were managed by internists or cardiologists.

Study outcomes and data collection

Primary outcome of the present study was HF rehospitalizations or cardiac death. Secondary outcomes were quality of life, cardiac performance, and pharmacological therapy. Echocardiography, 6-minute walk test (6-MWT), and quality of life assessment were scheduled at the enrolment, 6 months, and 1 year. Quality of life was assessed by the Kansas City Cardiomyopathy questionnaires (KCCQ).

Statistical analysis

Statistical analysis was performed using Chi-square or Fishers' exactest for discrete data and unpaired Student t-test for continuous data paired t-test was used to compare 2.01 score with in the same group between two period of time interval. Event-free survival defined as absence of primary end-point was estimated by the Kaplan-Meier Survival Curve. A p-value less than 0.05 was considered statistically significant.

Results

The present study included 100 patients (HF clinic group n = 50, control group n = 50). The mean age of the patients was 56 years; 62% were male at the time of enrolment. Most of the participating patients were in the New York Heart Association (NYHA) functional class IV during admission and the mean Left ventricular ejection fraction (LVEF) was 30%. The underlying reasons for heart failure were ischemic heart disease (48%) and cardiomyopathy (50%).The clinical characteristics of the patients are presented in Table 1. There were no statistically significant differences in demographic and clinical variables between the control group and study group.

Nine of 50 patients (18%) in the control group were lost to follow-up, while seven of 50 (14%), and eight of 41 (19.5%) were reported dead in the HF clinic

Table 1. Baseline characteristics of the patients

Characteristics	HF clinic (n = 50)	Control (n = 50)	p-value
Age (yr)	56.68 ± 15.15	56.74 ±13.91	0.98
Gender			
Male (%)	33 (66%)	29 (58%)	0.41
Female (%)	17 (34%)	21 (42%)	
Marital status			
Married	33 (66%)	37 (74%)	0.34
Single/widowed	27 (34%)	13 (26%)	
Symptom prior admission for HF (months)	1 (1-60)	1 (1-72)	
NYHA functional Class			
II (%)	3 (6%)	2 (4%)	0.69
III (%)	19 (38%)	16 (32%)	
IV (%)	28 (56%)	32 (64%)	
LVEF (%)	30.76 ± 11.64	30.74 ±10.30	0.99
Etiology of HF			
Ischemic heart disease	26 (52%)	22 (44%)	0.72
Cardiomyopathy	23 (46%)	27 (54%)	
Other	1 (2%)	1 (2%)	
DM (%)	20 (40%)	16 (32%)	0.41
HT (%)	22 (44%)	17 (34%)	0.31
Dyslipidemia (%)	24 (48%)	24 (48%)	1.00
Atrial fibrillation (%)	4 (8%)	6 (12%)	0.51
Previous MI (%)	8 (16%)	13 (26%)	0.22
Previous stroke (%)	2 (4%)	2 (4%)	1.00
Smoking (%)	8 (16%)	8 (16%)	1.00

(experimental) group and control group respectively. The rehospitalization rate was significantly fewer in the HF clinic group (24% vs. 46%, p-value of 0.04). The Kaplan-Meier curve showed that the patients from the HF clinic were less likely to be rehospitalized due to HF but not significant in mortality, p-value of 0.45 (Fig. 1A, 1B).

At the end of present study, the mean KCCQ overall summary score significantly increased in both groups from 56.08 ± 14.7 to 70.5 ± 16.08, p-value of 0.01 in HF clinic group and from 53.76 ± 13.2 to 61.44 ± 16.1, p-value of 0.03 in control group. The patients from the HF clinic evaluated a higher KCCQ overall summary score, p-value of 0.048 (Fig. 2).

Mean distance of 6-MWT and mean percentage of LVEF of the HF clinic group had statistical significance, p-value of 0.032 and 0.038 respectively (Fig. 3, 4). At the end of present study, the mean distance of 6-MWT increased from 327.9 ± 121.4 meters to 457.6 ± 122.9 meters, p-value less than 0.01 in the HF

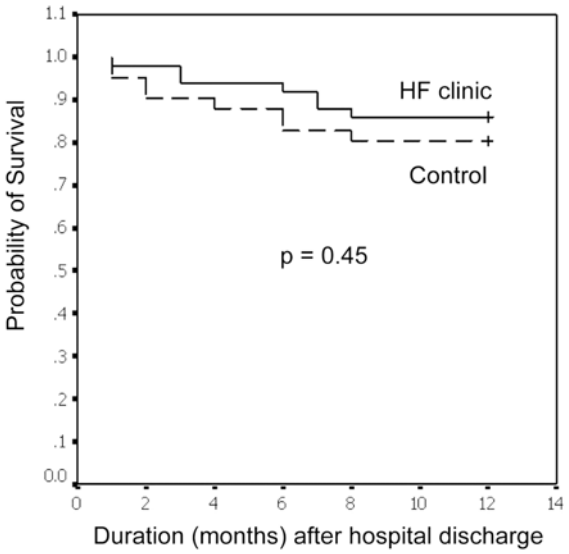

Fig. 1A Probability of heart failure death accorging to the type of care

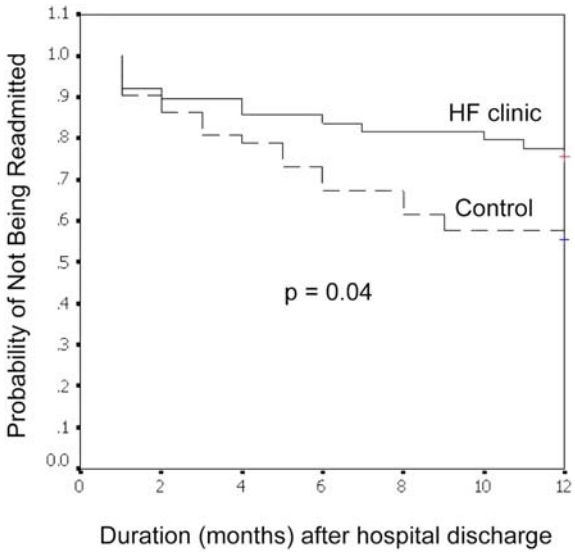

Fig. 1B Probability of heart failure rehosptalization accorging to the type of care

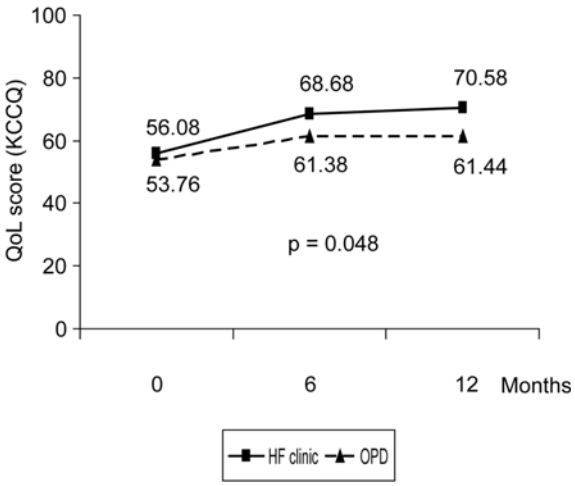

Fig. 2 Mean KCCQ overall summary score

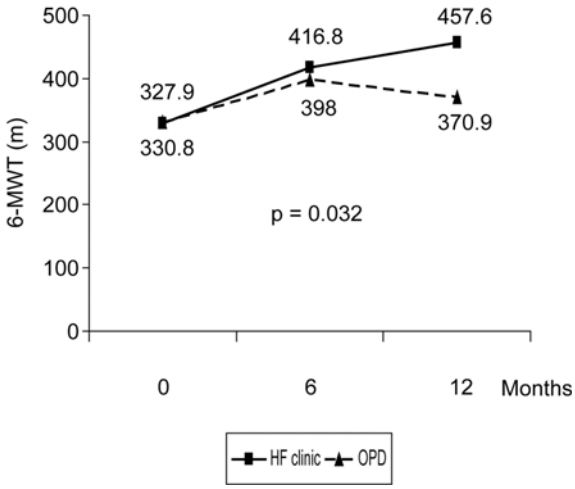

Fig. 3 Mean distance of 6-minute walk test

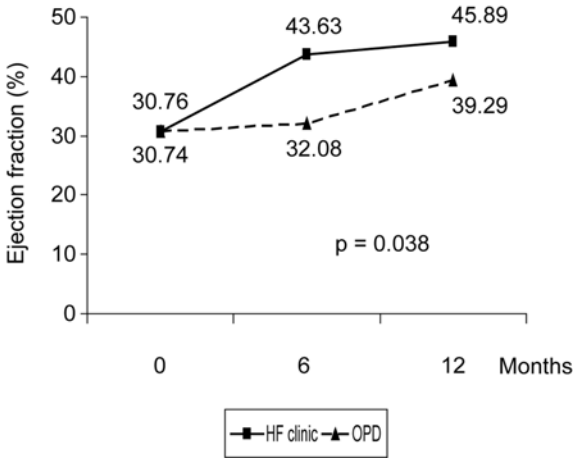

Fig. 4 Mean percentage of LV ejection fraction

clinic group and from 330.8 ± 112.7 meters to 370.9 ± 132.2 meters, p-value of 0.02 in control group (Fig. 3). The mean percentage of LVEF increased from 30.76 ± 11.6% to 45.89 ± 12.1%, p-value less than 0.01 in the HF clinic group and from 30.74 ± 10.3% to 39.23 ± 15.9%, p-value of 0.15 in the control group (Fig. 4).

During the follow-up, patients from the HF clinic group were significantly more prescribed beta blockers (84% vs. 42%, p-value less than 0.001), angiotensin converting enzyme inhibitors (86% vs. 60%, p-value less than 0.001) and angiotensin receptor blockers (20% vs. 2%, p-value of 0.01) (Table 2).

Discussion

This present study showed significant reduction of HF rehospitalizations, quality of life, and cardiac performance but not mortality among patients in HF clinic when compared to those receiving daily practice. HF disease management programs fall into three broad categories (1) HF clinics, (2) care delivered in the home or to patients who are at home, and (3) telemonitoring[11].

HF clinics are provided primarily in an outpatient clinic setting where patients come to receive care from practitioners with expertise in HF. HF clinics provide optimization of drug therapy, patient and family education, and counseling, emphasis on self-care, vigilant follow-up, early attention to signs and symptoms of fluid overload, and increased access to the health care provider.

The patterns of pharmacological therapy differed significantly between the compared groups of patients. Visits in the HF clinic allow frequent assessment of pharmacological therapy and clinical status by the HF specialists, who can adjust specific drug treatment and daily dose to the individual patient. The present study and recent trials[12,13] clearly demonstrated that interventions in a HF clinic is associated to more optimal prescription and titration patterns, especially in case of beta blockers and ACE Inhibitors.

A better improvement of cardiac performance assessed by LVEF and 6-MWT reflected more optimal prescription and titration in neurohormonal blockers (beta blockers, ACE inhibitors and angiotensin receptor blockers) in the HF clinic.

Quality of life represents an important issue for the HF patients. A significant difference in the KCCQ overall summary score reflected intensive educational and other efforts in the HF clinic.

In conclusion, management in the HF clinic improved outcome in the HF patients in terms of readmission rate, cardiac performance, and quality of life.

Table 2. Pharmacological treatment during follow-up

Pharmacological treatment	HF clinic (n = 50)	Control group (n = 50)	p-value
Beta blockers	42 (84%)	21 (42%)	<0.001*
ACE Inhibitors	43 (86%)	30 (60%)	<0.001*
AR B	10 (20%)	1 (2%)	0.01*
Spironolactone	22 (44%)	26 (52%)	0.42
Digoxin	23 (46%)	31 (61%)	0.10

ACE - angiotensin converting enzyme; AR B - angiotensin receptor blocker

Acknowledgement

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การศึกษาเปรียบเทียบผลการรักษาผู้ป่วยในคลินิกพิเศษสำหรับผู้ป่วยหัวใจล้มเหลวกับคลินิกผู้ป่วยนอก

เอนก กนกศิลป์, เกรียงไกร เฮงรัศมี, พรรณศักดิ์ วุฒิวโรภาส

วัตถุประสงค์*: เพื่อเปรียบเทียบ อัตราการรอดชีวิต อัตราการเข้ารับการรักษาตัวซ้ำในโรงพยาบาล สมรรถภาพของหัวใจ และคุณภาพชีวิตของผู้ป่วยที่รับการรักษาในคลินิกพิเศษสำหรับผู้ป่วยหัวใจล้มเหลว กับ ผู้ป่วยที่ได้รับการรักษาแบบผู้ป่วยนอกทั่วไปภายหลังจากออกจากโรงพยาบาล*

วัสดุและวิธีการ*: ติดตามผู้ป่วย 100 คน แบ่งเป็นกลุ่มศึกษาจำนวน 50 คนได้รับการติดตามการรักษาในคลินิกพิเศษสำหรับผู้ป่วยหัวใจล้มเหลว และกลุ่มควบคุมจำนวน 50 คนจะติดตามการรักษาแบบผู้ป่วยนอกในคลินิกผู้ป่วยนอกของสถาบันตามปกติ เป็นระยะเวลา 1 ปี*

ผลการศึกษา*: ผู้ป่วยที่รักษาในคลินิกผู้ป่วยหัวใจล้มเหลว มีอัตราการเข้ารับการรักษาตัวซ้ำในโรงพยาบาลต่ำกว่ากลุ่มควบคุม (12 ครั้ง vs. 23 ครั้ง, p-value =0.04) อัตราการการเสียชีวิตไม่แตกต่างอย่างมีนัยสำคัญทางสถิติ (7/50 vs. 8/41, p-value = 0.45)*

ผู้ป่วยที่รักษาในคลินิกผู้ป่วยหัวใจล้มเหลว เมื่อสิ้นสุดการศึกษา (12 เดือน) มีค่าเฉลี่ยของการบีบตัวของหัวใจห้องล่างซ้าย (LVEF) เพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ (p-value = 0.038) ค่าเฉลี่ยของการเดินบนพื้นราบ 6 นาที (6-minute walk test) เพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ (p-value = 0.032) ค่าเฉลี่ยของคะแนนคุณภาพชีวิต (KCCQ Score) เพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ (p-value = 0.048) เมื่อเปรียบเทียบกับกลุ่มควบคุม

สรุป*: คลินิกผู้ป่วยหัวใจล้มเหลวไม่เพียงแต่ลดอัตราการเข้ารับการรักษาตัวซ้ำในโรงพยาบาล ยังช่วยให้สมรรถภาพของหัวใจและคุณภาพชีวิตของผู้ป่วยที่มีภาวะหัวใจล้มเหลวดีขึ้น*