

## **Influence of Short Term Exercise on the Quality of Life of Patients with Chronic Heart Failure: Case Series from Saudi Arabia**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Cardiac rehabilitation (CR) is a comprehensive disease management program for heart failure patients. Most of the heart failure (HF) guidelines are classifying the cardiac rehabilitation for heart failure patients as class 1A which mean highly recommended. However, Arab countries and Middle East are lacking specific CR programs and guidelines. In this study, five cases of chronic heart failure patients were exposed to short term regular exercise for maximum 8 weeks. With a mean of 5.6 exercise visits there are 19.2% improvement in functional capacity, 35% improvement of exercise distance, 32.5% improvement in quality of life, 25% improvement in quality of sleep and decrease the emergency room visits by 37.5%.The significant improvement was in quality of life, exercise capacity and a decrease in ER visit for all patients.

**Keywords:** Cardiac rehabilitation; quality of life; ECG; exercise; chronic heart failure.

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## 1. INTRODUCTION

Congestive heart failure (CHF) is one of the leading causes of death in the world [1]. In Saudi Arabia, HF patients present at a relatively young age, compared with patients in developed countries, and predominantly have LV systolic dysfunction [2,3].

Projections show that by 2030 the prevalence of HF will increase by 25% from 2013 estimates in the US [4]. According to the WHO and MOH Statistical Yearbook, CVDs are the cause of 42% of non-communicable disease death in Saudi Arabia [5].

Quality of life is a relatively new scientific measure to evaluate effectiveness of treatment strategies and the course of a disease [6]. Quality of life is the well-being's ability to role and function the person's needs. Cardiac rehabilitation can improve the quality of life among patients with chronic heart failure. In addition to pharmacological therapy, literatures showed that exercising in regular basis can improve metabolic and hemodynamic condition in cardiac patients [7]. However most related research was conducted in Western cultures and may have limited applicability for individuals in Saudi Arabia [8]. Alghalayini et al, in Jeddah, Kingdom of Saudi Arabia evaluates the Effects of a structured heart failure program on quality of life and frequency of hospital admission in Saudi Arabia [9] however the intervention studies that address quality of life (QOL) in patients with HF participating in an exercise program are limited in our region.

Evaluating quality of care for patients with heart failure in Saudi Arabia is a study conducted in King Abdul Aziz Hospital of National Guard, Al Ahsaa as a single center study. It was able to reflect the positive aspects of HF patient care. However did have some identifiable weaknesses in the practice. [10].

The aim of the study is to assess the influence of short term exercise in the quality of life among chronic heart failure Saudi patients. And to implant recommendations that can improve the quality of life of chronic heart failure patients.

## 2. SUBJECT AND METHODS

In this study we recruit five chronic heart failure patients, 3 of them are male and two are female. All were simple randomly selected from cardiology clinics of King Abdul Aziz Hospital. All

of the patients signs participation consent. All Patients were exposed to exercise training program 3 times a week for one month. Quality of life for all patients was measured before and after intervention by Minnesota living with heart failure questionnaire (MLHFQ) [11]. Each patient has stress ECG test to evaluate the function capacity. Exercising program model invented for each patient according his base line function capacity and it was increased gradually during the month according to each patient exercise tolerance.

The chronic heart failure patient eligible to participate in the study on the basis of above 18 years old, diagnosed as chronic heart failure and did not has decompensation or hospital admission in last 2 month.

## 3. RESULTS

### 3.1 Case 1

A 50 years female patient is known hypertensive, diabetes mellitus, dyslipidaemia and ejection fraction (EF %) 35%. She started on 20/2/2019 and finished on 6/3/2019 with 4 visits totally. Metabolic equivalent (METs) improved from 3.86 to 4.9. Stress test was measured in the first visit which was 6:42 min. She finished her first exercise in 16:30 min and the last one was 23:00 min with same speed.

Quality of life in all showed 40% improvement, 40% improvement in distance walking, 40 % improvement in sleep disturbance, and 40 % improvement in in social activity. Furthermore 40% decrease in anxiety and tension, 50% decrease in symptoms, and 40% decrease in ER visit.

### 3.2 Case 2

57 years old male with history of DM, HTN, dyslipidemia CAD s/p CABG followed by PCI, ischemic cardiomyopathy with EF 45% and grade II diastolic dysfunction.

Patient did 3 visits between 13/1/2019 and 30/1/2019 with a speed between 2.6 MPH to 3.2 MPH. METs improved from 8.5 to 8.9. Patient finished the first exercise time was done in 23:00 min and the last ends in 31:05 min.

### 3.3 Case 3

65 years old male known Ischemic cardiomyopathy, EF 25%, and has an AICD. He

is hypertensive, ddyslipidemia, and diabetics with nephropathy. Patient is on treatment for epilepsy and Parkinsonism.

Patient has a stress ECG to evaluate the functional capacity by using modified Bruce protocol. He had been able to do 6:34 minutes on maximum speed 1.8 Mph and he did 3.7 METs. Further more Patient answer the questions of the Modified living with heart failure questionnaire to assess his quality of life. Patient started a walking exercise program, twice a week for one month. His Completed 8 visits. After one month patient able to do 4.8 METs which mean a 30% increasing in his basal METs? Furthermore the exercise time was increased from 20 minutes to 35 minutes.

His quality of life by using a modified living with heart failure questionnaire showed Quality of life in all showed 32 % improvement, 20% improvement in distance walking, 20% improvement in sleep disturbance, and 60% improvement in in social activity. Furthermore 60% decrease in anxiety and tension, 40% decrease in symptoms, and 50% decrease in ER visit. However, he has no improvement in sexual life, climbing stair or appetite.

### 3.4 Case 4

54 years old female patient is a known case of hypertension and HFpEF (heart failure with

preserved ejection fraction) with grade II diastolic dysfunction.

Established treadmill on 13/2/2019 and accomplished in 31/3/2019 with 8 times totally. Starting with 10.16 METs after 8 visits she reached 12 METs she finished the first trail of treadmill 22MIN with speed 2.3 and completed it in 32MIN with speed 4.5. Quality of life in all showed 40% improvement, 40% improvement in distance walking, 40 % improvement in sleep disturbance, and 40 % improvement in in social activity. Furthermore 40% decrease in anxiety and tension, 50% decrease in symptoms, and 40% decrease in ER visit.

### 3.5 Case 5

60 years old male has history of DM, HTN, dyslipidemia and ICMP with EF 30 %. He had 5 trials on the treadmill between 13/2 and completed on 25/4/2019 and showed a velocity progress which he started from 0.7KM and completed the last trial at 6.5KM. METs showed an improvement from 5.8 to 6.8.

Quality of life in all showed 18 % improvement, 40% improvement in distance walking, no improvement in sleep disturbance, and 20 % improvement in in social activity. No changes in appetite and sexual activity. Furthermore 20% decrease in anxiety and tension, 20% decrease in symptoms, and 20% decrease in ER visit.

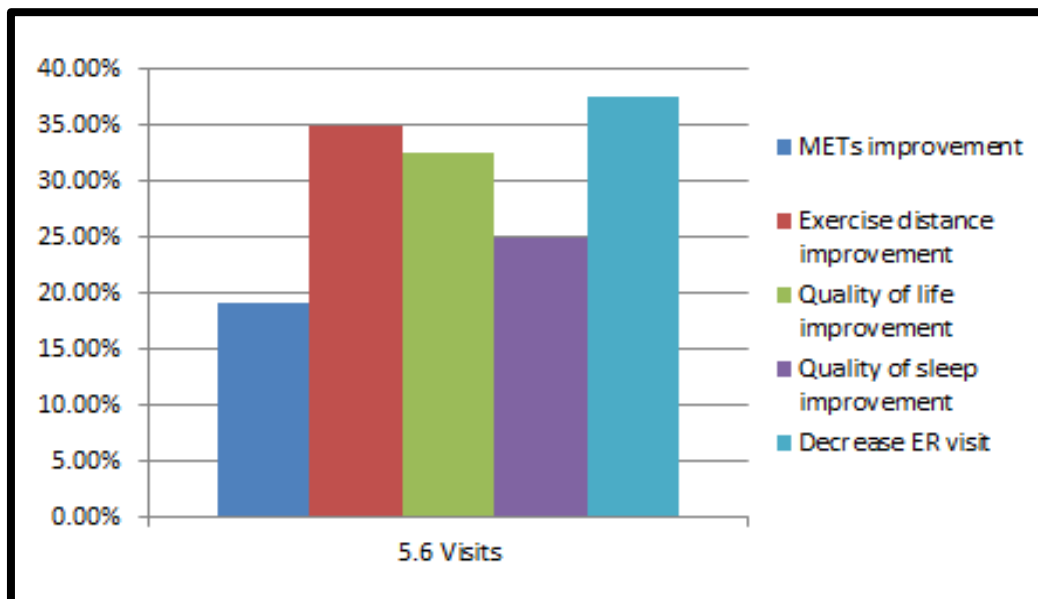


Fig. 1. Effects of short term exercise in heart failure patient with mean of 5.6 exercise visits

**Table 1. Summary of the cases findings**

<b>Patient</b>	<b>EF%-HF</b>	<b>visits</b>	<b>METs improvement</b>	<b>Exercise distance improvement</b>	<b>Quality of life improvement</b>	<b>Quality of sleep improvement</b>	<b>ER visit</b>
50 y female	35% HFrEF	4	27%	40%	40%	40%	40%
57 y male	45% HFmEF	3	4%	35%	No data	No data	No data
65 y male	25% HFrEF	8	30%	20%	32 %	20%	50%
54 y female	55% HFpEF	8	18%	40%	40%	40%	40%
60 y male	30% HFrEF	5	17%	40%	18%	0%	20%
Mean		5.6	19.2%	35%	32.5%	25%	37.5%

#### 4. DISCUSSION

In this study although the small number of patients and short exercise program but with a mean of 5.6 exercise visits there are 19, 2% improvement in functional capacity, 35% improvement of exercise distance, 32.5% improvement in quality of life, 25% improvement in quality of sleep and decrease the emergency room visits by 37.5%.The significant improvement was in quality of life, exercise capacity and a decrease in ER visit for all patients.

Cardiac rehabilitation (CR) is a comprehensive disease management program that is highly recommended by heart failure (HF) guidelines [12] and it is a health insurance mandatory covered for most of advanced country. In Japan, health insurance is mandatory and has covered CR for HF since 2007. CR is covered for 150 days in the Japanese health care system, and outpatient CR is covered for up to 60 minutes per session, 3 times a week [13]. However, Arab countries and Middle East are lacking specific CR programs and guidelines. There are a limited number of centers that provide and maintain the CR services [14]. According to Turk-Adawi and colleagues study, the all CR program in different Arab countries are only 8 CR programs; 4 in Gulf region (1 in Bahrain, 1 in Qatar, and 2 in United Arab Emirates), 4 in African areas (2 in Egypt, 1 in Algeria, and 1 in Tunisia) comparing to 128 CR programs in Canada [15]. Furthermore to my knowledge In Saudi Arabia there is a very few CR program.

Multidisciplinary aspects of CR play a key role in improving the quality of life and prognosis of patients with HF [16]. Kamiya et al in a retrospective cohort study demonstrated the prognostic effects of CR in both HF<sub>r</sub>EF and HF<sub>p</sub>EF [17]. Furthermore, Adachi et al, found that CR participation for 6 months after discharge have positive effects on the prognosis. However, the authors mentioned the limited availability of evidence regarding the effects of CR on the long-term prognosis of older patients or HF with preserved ejection fraction (HF<sub>p</sub>EF) [16].

The early randomized controlled trials, meta-analyses, and systematic review. They have shown that participation in CR decreases morbidity and mortality by approximately 25 % when compared to usual care, and significantly reduces risk factors, improves health-related

quality of life, and promotes a healthy lifestyle and better outcome that routine medical care alone [18,19].

#### 5. CONCLUSIONS

In this case series the short term exercise improve the quality of life, the functional capacity, the exercise distance, the quality of sleep and decrease the emergency room visits for the patients with chronic heart failure.

#### 6. LIMITATIONS AND SUGGESTIONS

1. The main limitation of this study is the small number of patients and the variable exercise program.
1. Limited number of CR program centers in Middle East countries.
2. Exhibit to the medical practitioners the importance and necessitate of CR program for heart failure patient in Middle East countries.
3. More local studies are in need to address the benefits of cardiac rehabilitation in the heart failure patients.
4. To implants local CR guidelines and to emphasis the mandatory cover of the CR in health insurance policies.

#### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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