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CARDIAC REHABILITATION IN POST-CORONARY ARTERY BYPASS GRAFT PATIENT: A CASE REPORT

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ABSTRACT

A 62 years-old male with medical history of type 2 diabetes mellitus, primary hypertension, chronic kidney disease, dyslipidemia, and ischemic cardiomyopathy was consulted. The patient had a coronary bypass surgery. He received medical treatment since then and his clinical condition greatly improved. It was found that the cardiac rehabilitation (CR) improved the functional capacity and reduced the cardiovascular risk factors. This case report shows the importance of cardiac rehabilitation programs and how it improves the quality of life for patients with heart failure, and hence, we recommend to have more centers specialized in this program in Saudi Arabia.

Key Words: Coronary artery bypass surgery, cardiac rehabilitation, cardiovascular risk factors, heart failure

INTRODUCTION

Cardiovascular diseases (CVDs) are the leading cause of death worldwide (Tessler and Bordoni, 2021) and cardiac rehabilitation (CR) is a program designed to help improve the health and recover from a heart attack and other forms of heart disease or surgery to treat heart disease (Supervia *et al*., 2019; Costi *et al*., 2021; Tessler and Bordoni, 2021). The CR is a comprehensive aerobic-based physical exercise program led by physical therapist, exercise physiologist and a qualified nurse. It depends on three elements-intensity, duration and frequency that are estimated by CardioPulmonary Exercise Testing (CPET), which is a parameter to explore body response to exercise intensity and to use the results for training prescriptions. Coronary Artery Bypass Graft (CABG) is a surgical procedure that improve survival in patients with advanced arteriosclerosis, such as >70% stenosis in the left main artery and multi-vessels lesions (Hillis *et al*., 2011). It is challenging to establish long-term prognosis in these patients following CAB. Hence, CR is highly recommended after CABG (Spiroski *et al*., 2017). It improves quality of life, prevents cardiovascular events, and lowers all-cause mortality.

CASE REPORT

A 62 years-old male with medical history of type 2 diabetes mellitus, primary hypertension, chronic kidney disease, dyslipidemia, and ischemic cardiomyopathy was consulted in the present case report. The patient had a coronary bypass surgery in 2010 and his left ventricular ejection fraction (LVEF) was 15%. He received medical treatment since then and his clinical condition greatly improved.

In 2014, he presented to the emergency department with paroxysmal orthopnea due to change in his medications timing. There were basal crackles on lung auscultation, chest x-ray showed mild bilateral basal congestion and echocardiography showed systolic ejection fraction of 20%, global hypokinesia with grade 2 diastolic dysfunction and the patient was admitted as decompensated congestive heart failure for medication readjustments. In 2015, the patient was admitted to the chest pain unit for elective implantable (single-cavity) virtual reality cardioverter-defibrillator (ICD-VR) implantation.

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A year after that, the patient presented again to the emergency room (ER) with progressive shortness of breath and productive cough with no chest pain or palpitations. ECG showed no ischemic changes and chest x-ray showed bilateral congestion. Echocardiogram (ECHO) was performed again and showed systolic ejection fraction of 15%, sever global hypokinesia with sever dilatation of the left ventricle and grade 3 diastolic dysfunction. The patient was started on anti-failure medications, and he was responding well. The patient was stable and was discharged on medications and risk factor modifications.

The patient was presented to the emergency department room (ER) again in 2017 with progressive shortness of breath, drowsiness and anuria. On physical examination, he was conscious and vitally stable. He had scattered crepitations bilaterally on lung auscultation. His laboratory investigations showed an elevated serum creatinine level of (1.4 mg/dL), Estimated glomerular filtration rate eGFR of (50), normal hemoglobin, platelets, white blood cell count and electrolytes level. Cardiac enzymes were improved (creatinine kinase-MB (CK-MB) 6, creatinine kinase (CK) 296 and troponin 0.19). Electrocardiograph (ECG) showed normal sinus rhythm, right bundle branch block and old ischemic changes. ECHO showed severe dilatation of left ventricle, severe global left ventricle hypokinesia, left ventricle ejection fraction less than 15%, left atrium mildly dilated, trivial mitral regurgitation, moderate to severe tricuspid regurgitation, normal pulmonary artery pressure, and systolic 28 mmHg. Diastolic dysfunction could not be evaluated with confidence. A wire was seen passing the tricuspid valve to the right ventricle.

He was admitted to Coronary Care Unit CCU, started dopamine 10 mcg and dobutamine 5 mcg/kg per minute. On the 5th of December 2017, the patient had attack of supraventricular tachycardia and hypotension. Direct current DC shock was done with 100 joules and 2 mg of midazolam. The patient successfully cardioverted and resumed the sinus rhythm.

On 7th of December 2017 at 3:00 a.m. in the morning, the patient had another attack of rapid atrial fibrillation at the rate of 160 to 180 beats per minute with hypotension 80/50, 25 mcg of fentanyl was given initially, and when the blood pressure built 100 mmHg of systolic, another 2 mg of midazolam was given and the patient received 100 joules of synchronized cardioversion and the patient reverted to sinus rhythm at rate of 100 beats per minute and magnesium and potassium were replaced. The pacemaker interrogation was done on the 5th and 7th of December 2017. It was VVI mode. All parameters were okay, 17 attacks of non-sustained V-tach. Five attacks only on the 7th of December 2017. No shock was given. Good battery. No V-tach. No Ventricular fibrillation VF. The patient continued at this time on normal saline and gradual withdrawal of dopamine was done.

On discharge he was given Aspirin 81 mg once daily, Fenofibrate 145 mg once daily, Atorvastatin 20 mg once daily, Metoprolol 12.5 mg twice (two times) a day (b.i.d), Omnic 0.4 mg once daily, Levothyroxine 200 mcg once daily, Pantoprazole 40 mg once daily.

DISCUSSION

CR offers support to the patients with a cardiovascular disease to improve their functional capacity and to reduce cardiovascular risk factors. In CR they are doing a special training program that usually includes 36 sessions in 12 weeks, and in addition they have the intensive CR program which includes 72 sessions that last for 18 weeks. CR program includes nutritional education so they teach the patients how they can choose appropriate food from the grocery, how they cook it, and which diet is appropriate to them. CR program also includes smoke cessation, psychosocial support, assuring suitable immunization. In previous studies, it was found that the mortality rate is reduced in patients who attend CR program. In addition, there is reduction in depression rate, improvement in functional capacity, management in lipids and comorbidities and slimming down in patients who attend CR program which indicate a good prognosis (Servey and Stephens, 2016).

30-40 minutes of aerobic activity for three-day-per-week is the typical exercise prescribed.CR programs cannot be supervised but monitored exercise for 6-8 weeks will familiarize patients with the activity, show them how their life becomes better and the exercise would not make any harm for them. Some patients need monitoring like those with atrial fibrillation, uncontrolled ventricular response and who suspect exercise-induced ventricular ectopy. If patients cannot attend the session, activity like walking for 20-30 minutes can show the same effect of CR and for progression patients could increase the speed or add 20-30 minutes (Piña, 2021).

CONCLUSION

This case report shows the importance of Cardiac rehabilitation programs and how it improves the quality of life for patients with heart failure. We recommend having more centers specialized in this program in Saudi Arabia.

CONSENT: Consent was taken from the patient without disclosing his name/ identity.

CONFLICT OF INTEREST: All authors declare no conflict of interest.

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