Preventive Cardiology – Risk Factors and Prevention, Secondary Prevention

Cardiovascular rehabilitation - determinants of long-term outcomes

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Funding Acknowledgements: None.

Introduction: Recent clinical evidence reinforces cardiac rehabilitation as a cornerstone for patient recovery and improvement after a serious cardiovascular event. Therefore it's important to study what are the measures with the highest impact on outcomes.

Purpose: To study determinants of long-term success in cardiovascular rehabilitation.

Methods: A retrospective study in patients involved in a cardiovascular rehabilitation program at a tertiary hospital from 2013 to 2023. The main endpoint of major events was a composite of: hospital admission, hospital admission due to cardiac disease, re-infarction, death and death from cardiac causes. Statistical analysis was conducted using dedicated statistical software.

Results: This study involved 446 patients, the majority were male (80.5%) and the average age was 60.5 ± 11.5 years [28; 90]. Patients were followed, on average, for 30.5 ± 21.2 months [1.2; 109.3].

In terms of comorbidities: 72.2% had dyslipidemia, 72.1% hypertension, 26.4% diabetes, 15.3% atrial fibrillation, 13.0% pulmonary disease, 5.9% chronic kidney disease (CKD); and 31.2% were smokers.

The average initial values for: body mass index was 27.6 ± 4.3 Kg/m2, low density lipoprotein (LDL) was 88.8 ± 41.8 mg/dL, glycated hemoglobin was 6.1 ± 1.1%.

Overall, patients attended 13.3 ± 4.3 sessions (92.1 ± 12.2% of the target).

Fifty four (12.1%) patients reached the composite endpoint; 44 (9.9%) were admitted to the hospital, 26 (5.8%) of which due to cardiovascular disease; 4 (0.9%) had a re-infarction; 17 (3.8%) died, 9 (2.0%) of which due to a cardiac cause. Mean time to reach the composite endpoint was 6.3 ± 3.3 months.

The major determinants of the composite endpoint were: being a smoker at baseline ($p = 0.009$), number of coronary arteries affected ($p = 0.027$), CKD ($p = 0.023$), peripheral artery disease (PAD) ($p = 0.005$), LDL at follow-up (FU) ($p = 0.050$), final arm strength ($p = 0.021$), final metabolic equivalent of task (MET) ($p = 0.010$), and initial end-tidal carbon dioxide pressure (EtCO2) ($p = 0.045$).

Conclusion: In this study, it was possible to identify initial smoker status, number of coronary arteries affected, CKD, PAD, LDL level at FU, final arm strength, final MET and initial EtCO2 as determinants of cardiovascular rehabilitation success.

Smoking plays a pivotal role in cardiac diseases, making it mandatory to address it in a preemptive way; lipid lowering measures must be taken aggressively and programs ought to include activities to improve a patient's physical conditioning.