Feasibility and safety of a trimodal prehabilitation program in patients awaiting cardiac surgery to improve functional capacity

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Background and Goal of Study

Cardiac surgical patients usually present a multifactorial reduction in aerobic capacity and a sedentary lifestyle. Multiple comorbidities, perception of severe illness and fear of worsening symptomatology contribute to physical inactivity and deterioration of their functional status. During the preoperative period there is a unique opportunity to optimize our patients, trying to decrease the incidence and severity of the postoperative complications.

Trimodal prehabilitation has demonstrated a reduction on the incidence of postoperative complications in certain groups of patients undergoing major abdominal surgery. However, there is little experience regarding prehabilitation in cardiac surgery and most studies have only included low risk patients.

Our objective is to assess the effect of a multimodal prehabilitation program on functional capacity in cardiac surgery candidates. Secondly, we aimed to analyze the feasibility and safety of the program.

Materials and Methods

Patients 18-80 years old with a waiting time of >4 weeks for cardiac surgery (CABG, valve and/or ascending aortic surgery) were included. Inclusion and exclusion criteria listed on table 1 and 2. The program consisted on

- 1) In situ or home based controlled exercise training.
- 2) Nutritional support and education
- 3) Cognitive support with mindfulness appointments.

Assessments of the functional status, level of activity, nutritional and psychological aspects were made at baseline and when finishing the program.

INCLUSION CRITERIA
Age 18-80 years
Acceptance to participate in the Prehabilitation Program
Estimated waiting time before surgery >4 weeks
Mitral Valve surgery
Aortic Valve surgery
Ascending Aorta Surgery
CABG surgery (stable angina)

Table 1: Inclusion criteria for the Prehab program

EXCLUSION CRITERIA
Cognitive or Physical impairment
Functional Classification NYHA IV
Left Main Coronary Artery disease
Left Ventricular Ejection Fraction <30%
Dynamic Left Ventricular Outflow Tract
Acute Myocardial Infarction < 1 month
Severe Mitral or Aortic Stenosis
Severe Pulmonary Hipertension (>60mmHg)
Unstable Angina

Table 2: Exclusion criteria for the Prehab program

Results and Discussion

Compliance to the program was 90%. There were no major complications or events thorough the program. The program significantly increased functional capacity measured in an increase of the 6MWT distance and Sit-to-Stand test repetitions, as well as patient reported physical activity measured by the Yale Physical Activity Survey.

TEST	BASELINE	PREOPERATIVE	p
6-Minute Walking Test (m)	486,2	514,1	<0,05
Sit-to-stand Test (reps)	11,9	13,7	<0,05
Yale Questionnaire	41,1	54,51	<0,05

Table 4: Improvement in functional capacity and physical activity parameters

Gender	Male n= 44 (75%) Female n= 15 (25%)
Age	63,9 (±8,9) years
ASA	ASA II n= 2 (3%) ASA III n= 46 (78%) ASA IV n= 11 (19%)
EuroScore	2,2% (±2,0)
Charlson Index	3,67% (±1,45)
Type of surgery	Valve Surgery n= 34 (58%) CABG n= 18 (30%) Combined n= 7 (12%)
Prehab Duration	7 weeks (±5)

Table 3: Characteristics of patients included in the program

Conclusions

The implementation of a multidisciplinary Trimodal Prehabilitation Program as a preoperative optimization strategy in patients awaiting cardiac surgery is feasible and safe. Results show positive effects of prehabilitation on functional capacity.