

How much exercise heart failure inpatients can perform?

Bruno Delgado¹, Ivo Lopes², Bárbara Gomes³, André Novo⁴

¹Oporto Hospital Center, Porto, Portugal; NURSEID: CINTESIS; ²Oporto Hospital Center, Porto, Portugal; ³NURSEID: CINTESIS; Escola Superior de Enfermagem do Porto, Porto, Portugal, ⁴NURSEID: CINTESIS; Polytechnic Institute of Bragança, Health School, Bragança, Portugal

NO CONFLICTS TO DECLARE

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INTRODUCTION

Decompensated Heart Failure (DHF) patients have a significant functional dependence, impairment of performance in activities of daily living and low exercise tolerance^{1,2}. Exercise is a well establish cardiac rehabilitation intervention which leads to improvement of symptoms, and is recommended even for inpatients^{1,3}. The amount of Exercise is directly related to its benefits⁴ and the volume of exercise performed must be adjusted to safety issues³. ERIC-HF program is an aerobic exercise training program developed for HF inpatients (Table 1)⁵.

PURPOSE

To evaluate the volume of exercise that HF inpatients preformed, according to ERIC-HF program.

METHODS

Cross-sectional study with a sample of 72 patients enrolled. Data collection included a functional evaluation at admission and discharge (Barthel Index (BI) and London Chest Activity of Daily Living Scale (LCADL)); also a six minute walking test (6MWT) was performed twice: as soon as the patient was capable of it and at discharge. ERIC-HF program consists into five sequential stages of increasing levels of intensity. Stage V is the most intense and complies a greater volume of exercise comparing with the other stages. Volume of exercise was measured in terms of the number of turns on the cycloergometer, meters walked, number of steps climbed and the total amount of time spent exercising.

Patients were compared according to the stage they had reached: Group A - the group that reached the fourth stage and Group B - the group that reached the fifth stage.

RESULTS

Baseline characteristics of the patients such as age, functional capacity and pathophysiological status are presented in Table 2. A total amount of 987 sessions of exercise was performed, with an average of 14 (±5) sessions for each patient. 30 patients discharged at stage IV and 42 patients at stage V. The performance of exercise during the inhospital stay is presented on graphs 1 and 2, comparing the two groups. Regarding comparisons, at a 95% confidence interval, it was found some interesting results, shown in Table 5. Statistical significant comparisons were found in terms of the distance walked in the 6MWT at discharge, the BI at discharge, total meters walked, total time spent exercising and the duration per session of exercise. No other variable presented a significant difference

Patients performed progressive periods of exercise with lower levels of perceived exertion (Borg modified scale), presenting an average of 6 (±3) at the admission and 2 (±2) at the discharge day. No major adverse events occurred during the sessions of exercise (Table 3).

LIMITATIONS

The main limitations of this study were: 1) patients did not performed the same number of sessions and volume of exercis; 2) the relatively small study sample; 3) the inability to perform subgroup analysis for important characteristics, namely left ventricular ejection fraction; 4) the lack of devices that could evaluate the metabolic equivalents during exercise, namely accelerometers.

CONCLUSIONS

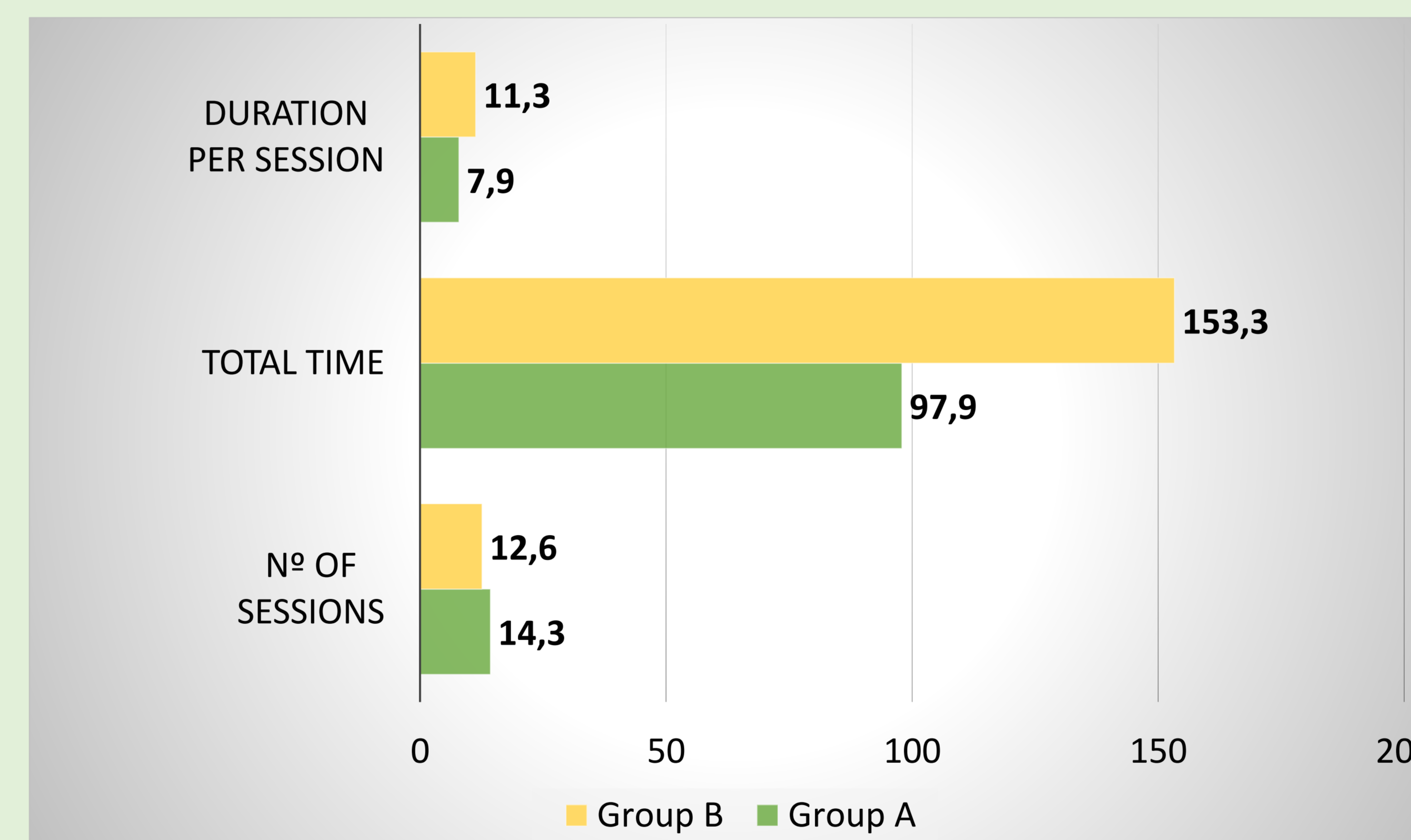
HF inpatients can perform aerobic exercise training, incrementing the total amount of exercise every day in a safe way. Apparently, patients who perform a great volume of exercise can improve much more their functional capacity (38.3% vs 17.2%) after an inhospital stay for stabilization of decompensated HF, in this sample of patients.

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Stage	Type of exercise
I	Respiratory and calisthenic exercises performed in supine or orthostatic position
II	5 to 10 min on cycle ergometer
III	5 to 10 min walking
IV	10 to 15 min walking
V	10 to 15 min walking and 5 min climbing stairs (patients may stop for recovery)

Table 1 – ERIC-HF program stages



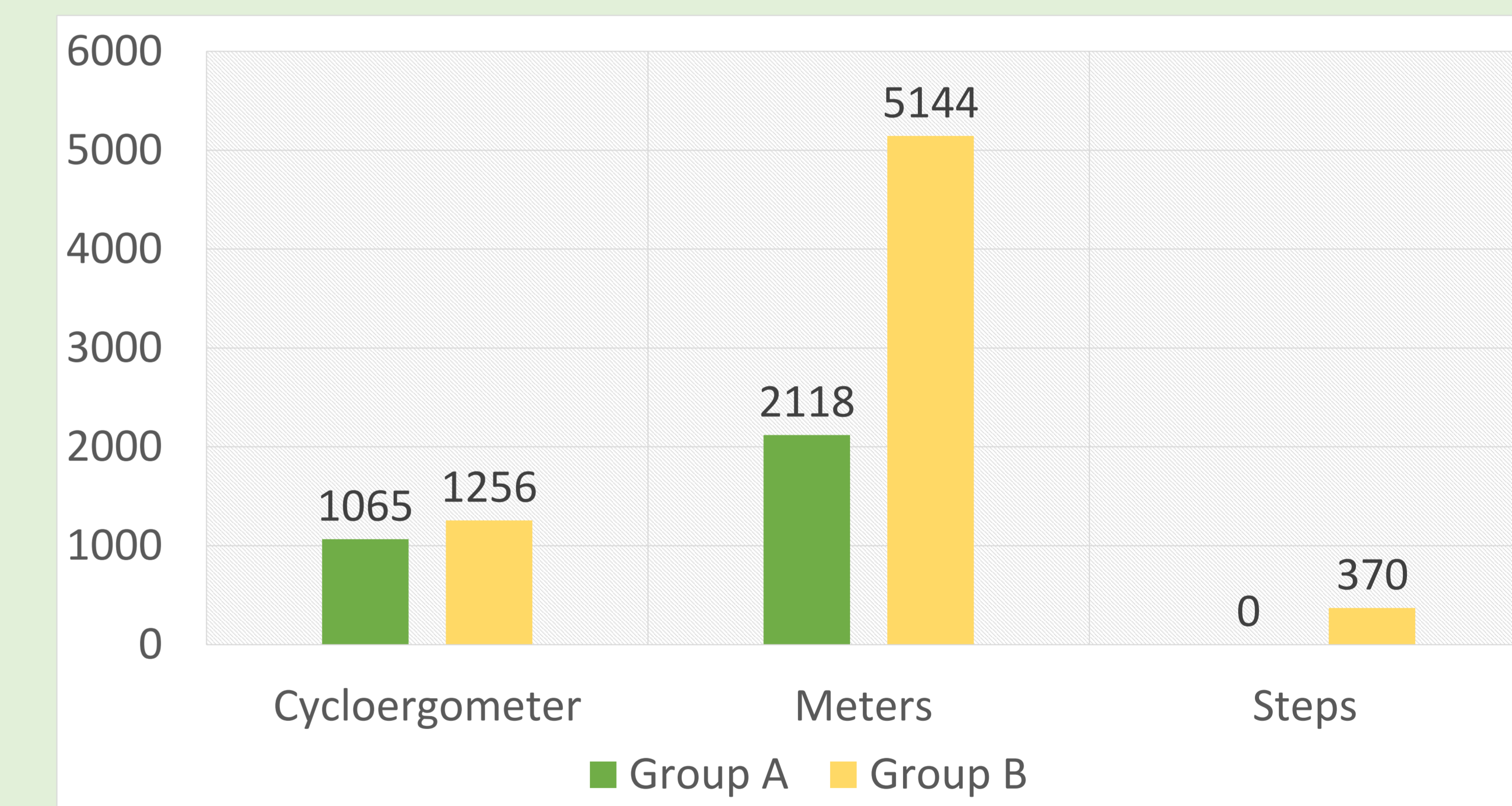
Graph 1 – performance of exercise

Adverse Event	N (%)
Atrial fibrillation (rapid ventricular response)	29 (2.9%)
Decrease of SBP ¹ > 10mmHg	42 (4.5%)
Clinical worsening	0 (0%)
SPE ² ≥ 8	112 (11.3%)
Precordial pain	0 (0%)
Cardiac arrest	0 (0%)
Major arrhythmic events	0 (0%)

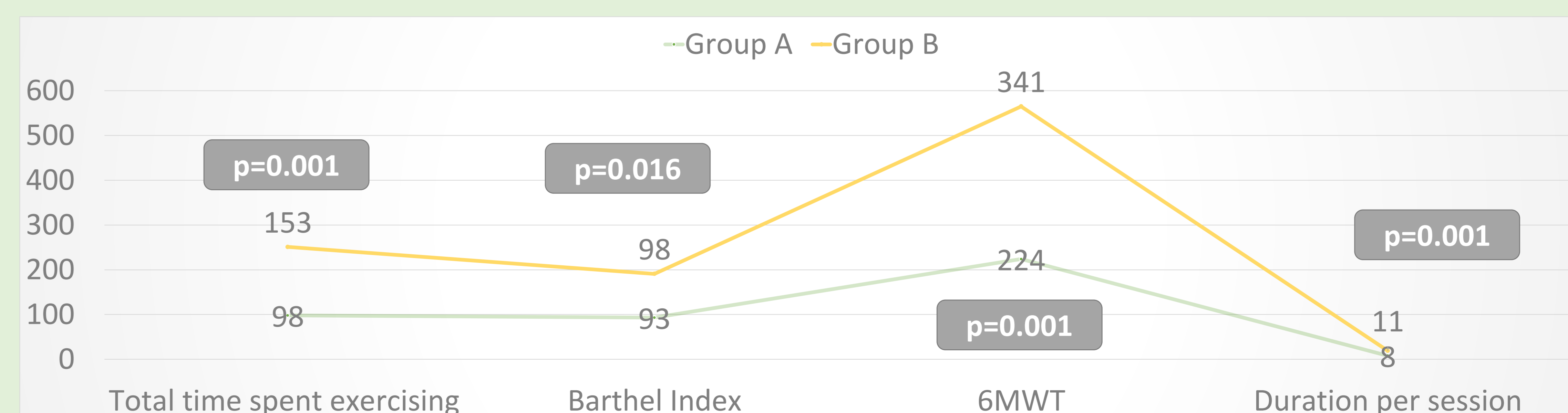
Table 3 – adverse events

Parameter	Value
Age (years)	69.3±9.5
Gender	46±9.5 M (63.8%); 26±7.5 F (36.2%);
Inhospital stay (days)	19±18.7
Functional status	
LCADL ² admission	32±8.5
Barthel admission	73.3±19.9
First 6MWT (m)	199.9±115.9
Functional class	
NYHA ³ III	59 (81.9%)
NYHeA ³ IV	13 (18.1%)
Ethiology	
Dilated	11 (15.2%)
Atrial fibrillation	5 (6.9%)
Valvular disease	22 (30.5%)
Isquehmic disease	25 (34.7%)
Other	9 (12.5%)
LVEF⁴	
HFpEF ⁵	10 (13.8%)
HFmEF ⁶	9 (12.6%)
HFrEF ⁷	53 (73.6%)

Table 2 – characteristics of the patients



Graph 2 – performance of exercise



Graph 3 – comparisons between groups