

Early Rehabilitation in Cardiology – Heart Failure (ERIC-HF) program: Multicenter randomized controlled trial

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NO CONFLICTS TO DECLARE

Keywords: heart failure, exercise, rehabilitation, functional capacity || bruno.m.delgado@gmail.com

INTRODUCTION

Heart failure (HF) is characterized by dyspnea, fatigue and edema that leads to decreased exercise tolerance, functional dependence and impairment of performance in activities of daily living (ADL)^{1,2}. Exercise is a well-established intervention, for patients with stable chronic HF, which leads to improvement of symptoms, promotes functional capacity and decrease exercise intolerance^{3,5,6}. However, little is known about exercise for HF inpatients⁴. The ERIC-HF (Early Rehabilitation in Cardiology – Heart Failure) program is an aerobic exercise training (AET) program designed for patients admitted due to decompensated HF, tested recently (pilot study)⁷.

PURPOSE

To evaluate the feasibility, safety and also reproducibility of the program in other centers and to analyze if there are the same results shown on the pilot study.

METHODS

Multicenter randomized single-blind controlled trial developed in 8 different cardiology wards. Patients were randomized in training group (TG) or control (CG). Data includes cardiovascular history, HF history, London Chest of Daily Living Activities (LCADL) and Barthel Index (BI). TG patients perform the ERIC-HF program twice a day, 5 days a week. ERIC-HF program is a supervised AET program, with increasing levels of intensity (Table 1). Vital signs, Borg Modified Perceived Exertion (BMPE) and any adverse event were evaluated before and immediately after the exercise. CG patients perform physical activity in accordance with the guidelines available for inpatients, always supervised too. At discharge was performed a 6 minute walking test (6MWT), and evaluation of LCADL scale and BI, for comparison.

Endpoints of the study : difference between admission and discharge score of BI and LCADL, distance walked in the 6MWT and the safety parameters.

RESULTS

221 patients were randomized (117 in TG – 1441 training sessions). The average age was 68 years old, 110 were male, 62% are in NHYA class III. At admission, both groups of patients have the same characteristics. The major etiology of HF is ischemic and valvular disease and most patients have reduced ejection fraction (Graph 1). At discharge, TG present lower LCADL and Borg score, higher BI score and higher average distance walked in the 6MWT. Differences in LCADL and 6MWT are statistically and clinically significant ($p < 0,000$ LCADL; $p = 0,004$ 6MWT) (Table 3). The average distance on 6MWT by TG is 47 meters higher.

Regarding safety, graph 3 show which and how many occurred. Those events are related with the performance of ERIC-HF program stages of exercise, and all of them were properly controlled. Comparison between pilot and multicenter patients are presented in graph 2.

LIMITATIONS

The main limitations of this study were: 1) patients did not performed the same number of sessions; 2) the absence of a 6MWT at admission; 3) the relatively small study sample; and 4) the inability to perform subgroup analysis for important characteristics, particularly left ventricular ejection fraction

CONCLUSIONS

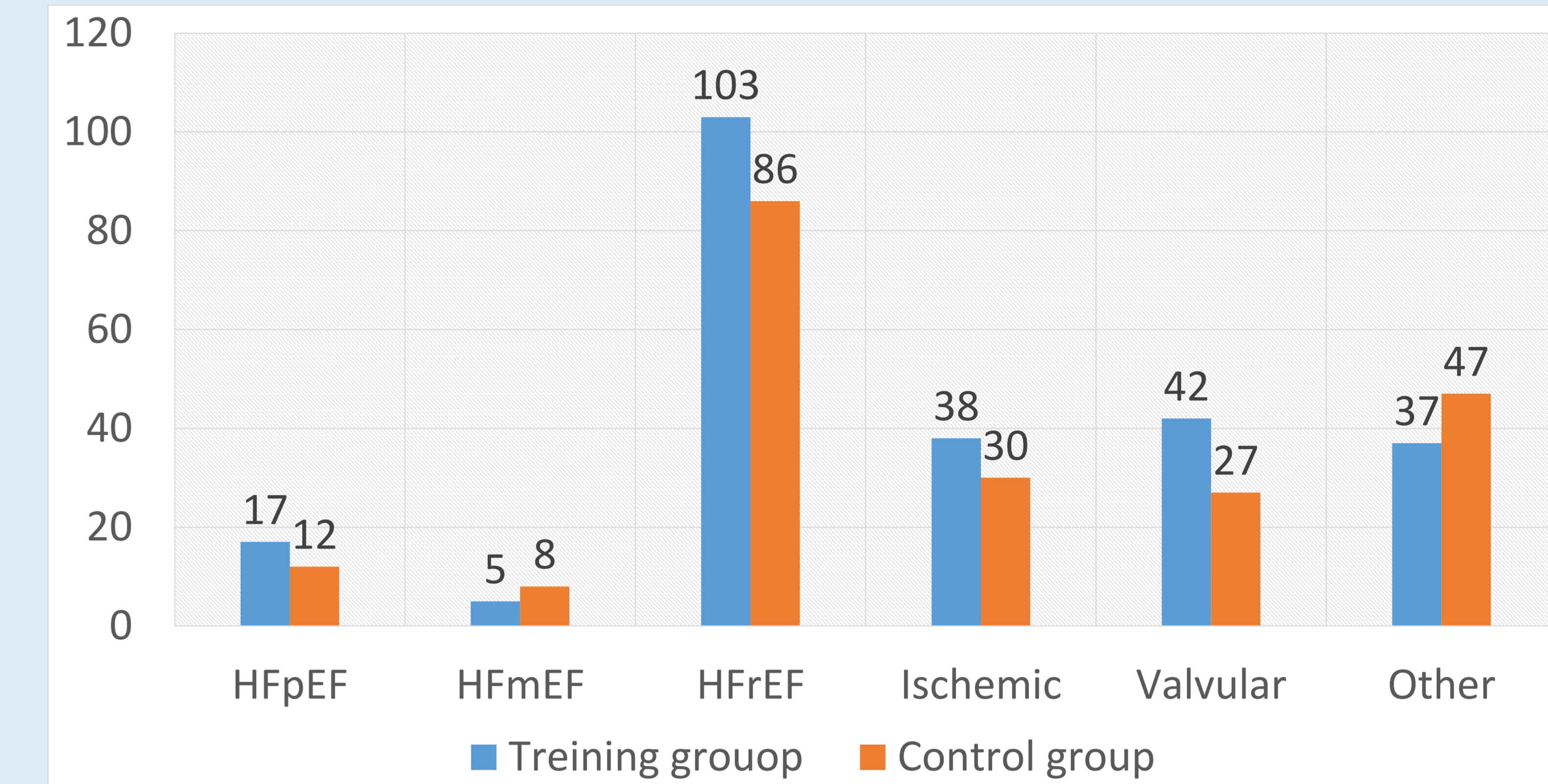
The ERIC-HF program demonstrated to promote functional capacity. Regarding safety, we can infer that the few adverse events registered aren't major, and does not represent that exercise can be deleterious for decompensated HF patients, however more research should be done. We can also infer that probably AET is safe and viable, for HF patients and must be encouraged. No other study of our knowledge has demonstrated this findings.

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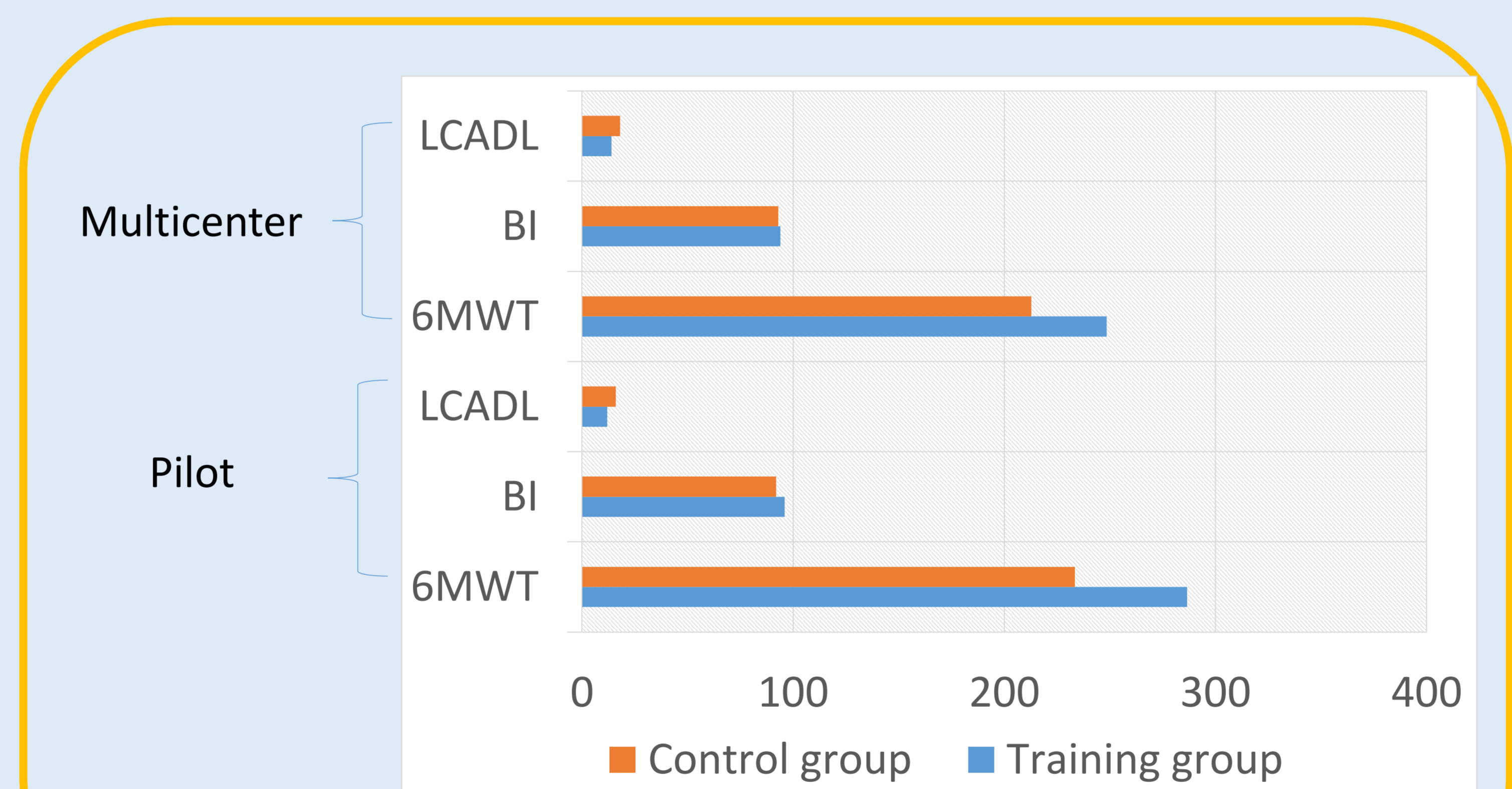
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Stage	Exercise
I	Respiratory and callisthenic exercises performed in supine or orthostatic position
II	5 to 10 min on cycloergometer
III	5 to 10 min walking
IV	10 to 15 min walking
V	10 to 15 min walking and 5 min climbing stairs (patients may stop for recovery)

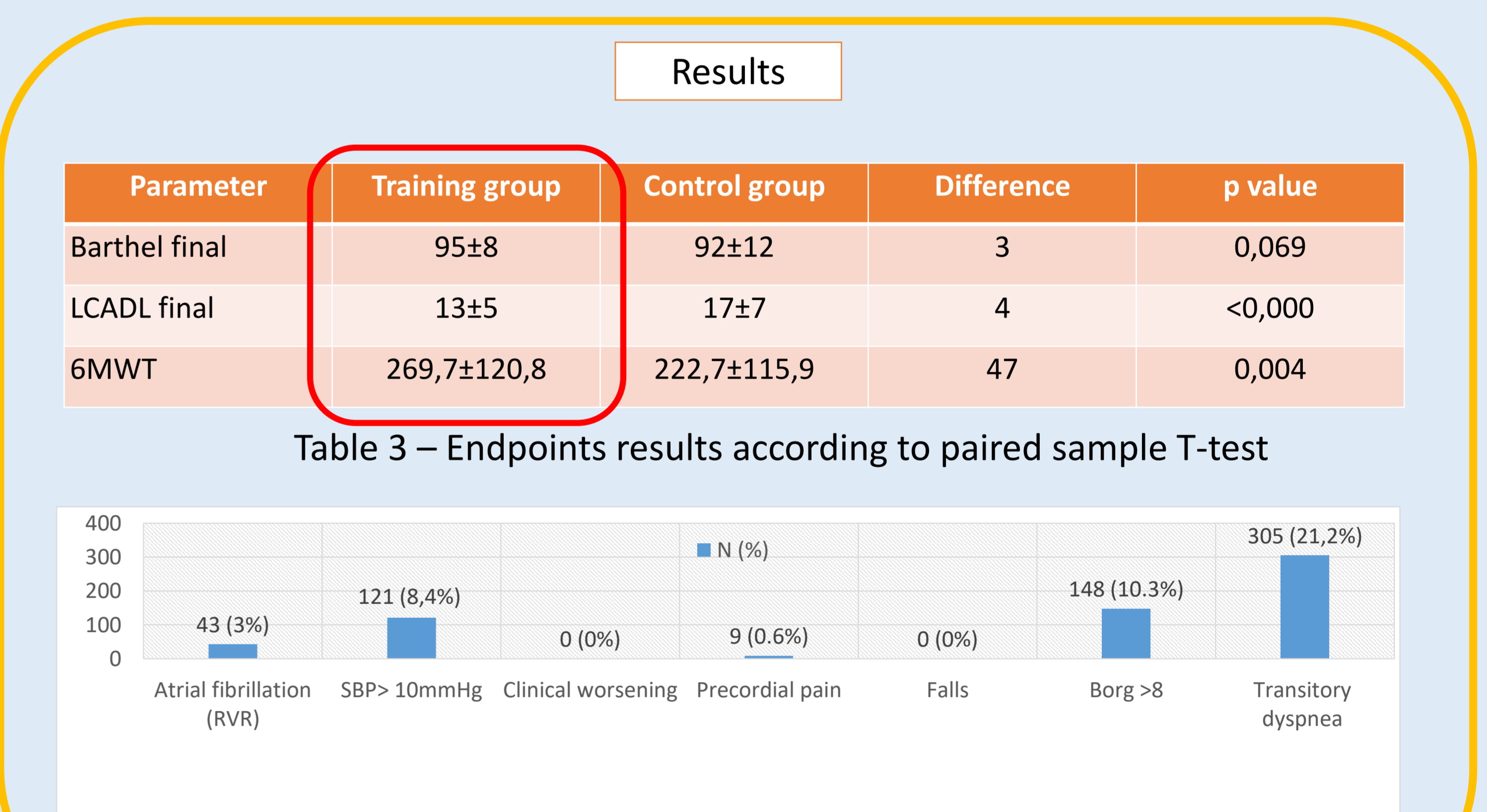
Tabel1 – ERIC-HF program stages



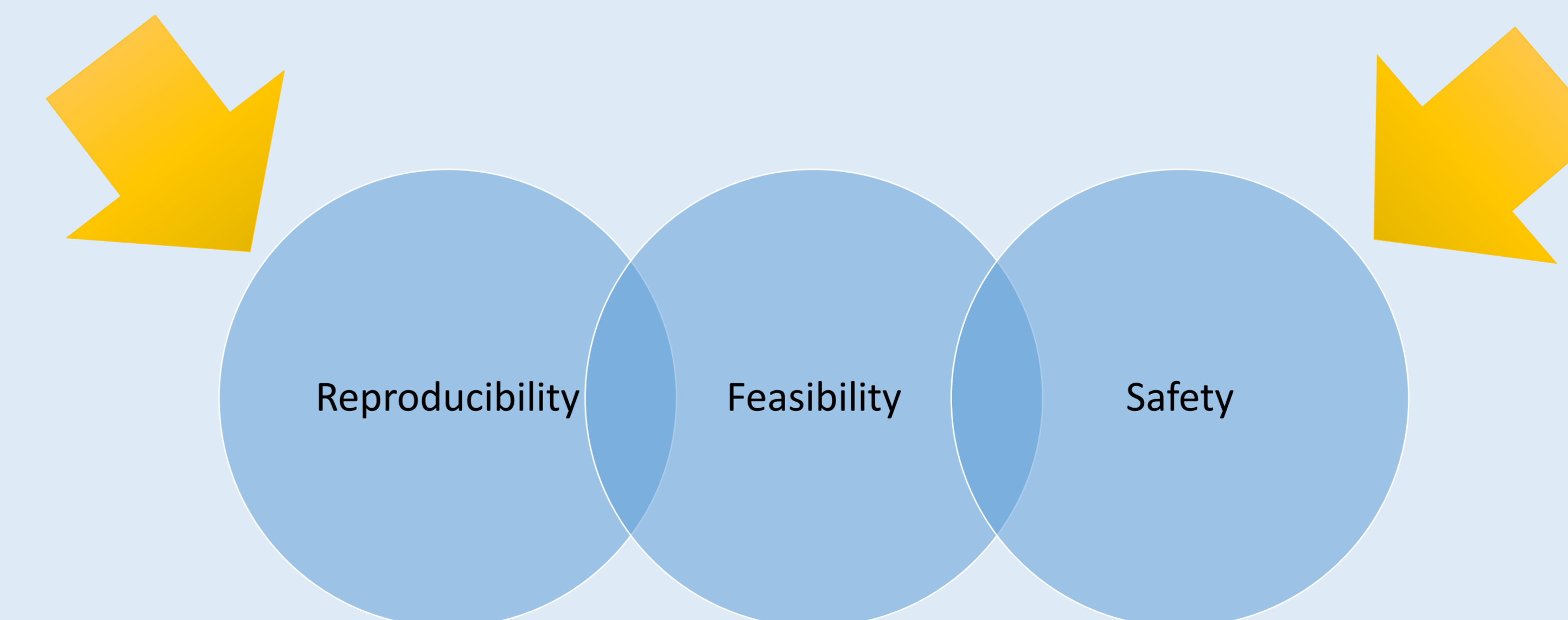
Graph 1– ventricular function and etiology of HF



Graph 2 – Comparison between the results of pilot and multicentre study



Graph 3 – Nº of adverse events during the sessions of exercise



KEY MESSAGES

- ERIC-HF program is **SAFE** and promotes **FUNCTIONAL CAPACITY**, being also **REPRODUCIBLE** in different contexts
- Systematization of interventions is the key to effectiveness

