

Exercise in patients admitted for decompensated Heart Failure – cardiac rehabilitation

Bruno Delgado¹, André Novo², Bárbara Gomes³

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

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^{1,3}. However, exercise is not yet validated for patients during the phase of stabilization⁴. The ERIC program is an aerobic exercise training (AET) program designed for patients admitted due to decompensated HF, aiming to promote their functional capacity.

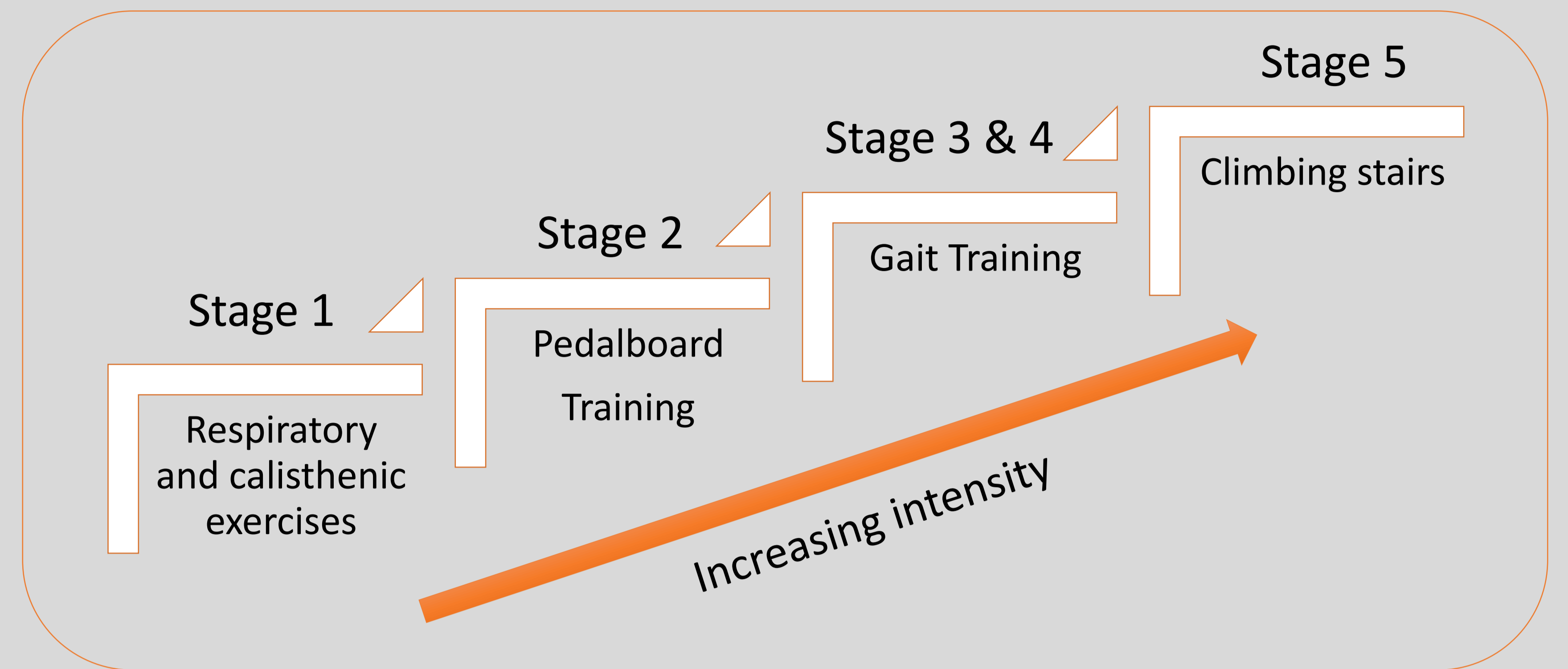


Figure 1 – ERIC program stages

PURPOSE

To evaluate the safety and feasibility of the ERIC program in patients admitted to decompensated HF, during hospitalization. To infer the potential of AET to promote functional capacity in patients admitted due to decompensated HF.

METHODS

All patients admitted due to HF are randomized in training group (TG) or control (CG). Data includes cardiovascular history, HF history and two functional tools: London Chest of Daily Living Activities (LCADL) and Barthel Index (BI). TG patients perform the ERIC program twice a day, 6 days a week, if possible. ERIC program is a supervised aerobic exercise program, with increasing levels of intensity, divided into 5 stages (figure 1). In all sessions are evaluated vital signs before and after the exercise, as well as Borg Modified Perceived Exertion scale. CG patients are supervised too and perform freely physical activity. At discharge, all patients perform a 6 minute walking test (6MWT), and evaluation of LCADL scale and BI, for comparison. Endpoints of the study are: difference between admission and discharge score of BI and LCADL, distance walked in the 6MWT and the safety parameters.

RESULTS

Until now, 73 patients are randomized (33 in TG - 562 sessions of ERIC program). 48 are male, 77% are in NYHA class III and 23% are class IV. At admission, both groups of patients have the same level of functional dependence and sociodemographic characteristics (table 1). At discharge, TG present lower LCADL and Borg score and higher BI score. Those differences are statistically significant (p=0,02 LCADL; p=0,016 Barthel). The average distance on 6MWT by TG is 72 meters higher, which is a statistically significant (p=0,05). (table 2). Regarding safety, only a non-significant number of adverse events had occurred, but none of them were critical, as shown in table 3. Those events are related with the performance of ERIC program stages of exercise, and all of them were properly controlled.

CONCLUSIONS

ERIC program can safely promote functional capacity, being more effective than the usual care. TG patients can walk a few meters more, which is clinically significant, because it means that these patients can be more independent on their ADL's. Since this is an AET program, we can infer that exercise could be effective and safe, in HF patients during hospitalization, although more investigation is needed, with larger number of participants to firmly validate the feasibility of AET.

Randomization

Training group (n=33)	Parameter	Control group (n=40)
70 ± 9	Age (years)	72 ± 10
9 F, 24 M	Sex	16 F, 24 M
19 ± 9	Nº days of hospitalization	16 ± 10
3 ± 1	CVRF	4 ± 1
33 ± 8	LCADL inicial	33 ± 7
72 ± 19	Barthel inicial	74 ± 15
24 ± 9	NYHA III	32 ± 10
9 ± 9	NYHA IV	8 ± 9

Table 1 – Sociodemographic and functional characteristics between groups, at the beginning

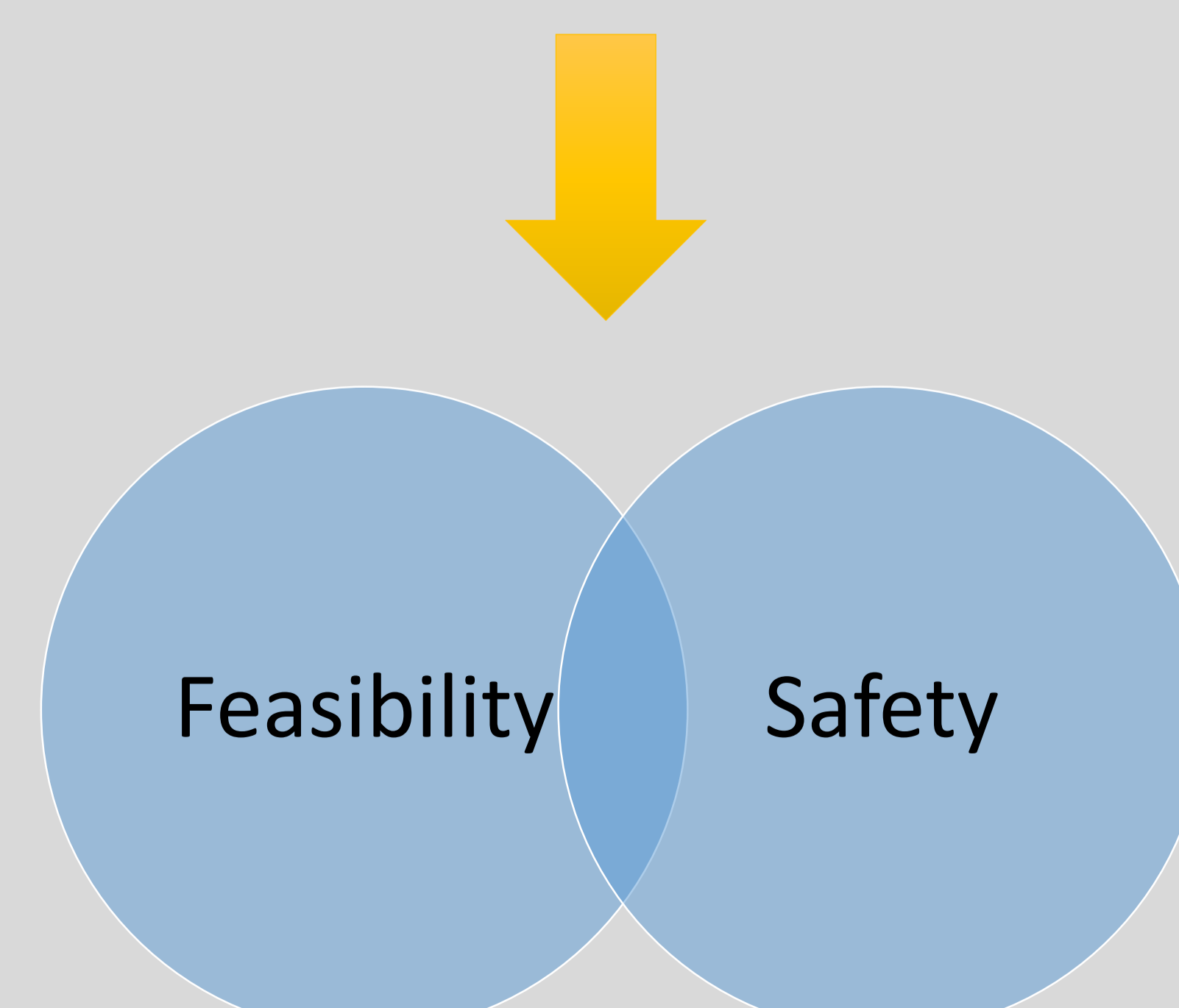
Results

Parameter	Training group	Control group	Difference	p value
Barthel final	96±6	93±8	3±7	0,016
LCADL final	13±4	17±8	4±6	0,02
T6MM	286±127	222±108	64±117	0,05

Table 2 – Endpoints results according to Mann-Whitney U test

Nº of sessions	Atrial fibrillation	Fall of SBP> 20mmHg	Clinical worsening	Borg ≥ 8	Precordial pain
562	12 (2,1%)	46 (8%)	0	39 (7%)	0

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



REFERENCES

- Gary RA, Cress ME, Higgins MK, Smith AL, Dunbar SB. A combined aerobic and resistance exercise program improves physical functional performance in patients with heart failure: a pilot study. *J Cardiovasc Nurs.* 2012;27(5):418-30
- Ponikowski P, Voors AA, Anker SD, et al. 2016 ESC Guidelines for the Diagnosis and Treatment of Acute and Chronic Heart Failure. *Rev Esp Cardiol (Engl Ed).* 2016;69(12):1167.
- ACSM. Guidelines for Exercise Testing and Prescription. In: Agiovlasitis S, Baruth M, Baynard T, Beck, Darren T., Brawner CA, editors. Tenth Edition ed2016.
- Mezzani A, Cacciatore F, Catanzaro R, et al. Early-start Exercise training after acute hemodynamic decompensation in patients with chronic heart failure (RE-START). A multicenter, randomized, controlled trial on short-term feasibility and impact on functional capacity, symptoms and neurohumoral activation. *Monaldi Arch Chest Dis.* 2014;82(1):20-