

## Relationships between physical capacity and depression in heart failure patients undergoing hybrid comprehensive telerehabilitation vs usual care results of the TELEREH-HF randomized clinical trial

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**Introduction:** The novel hybrid comprehensive telerehabilitation (HCTR) consisting of telecare (with psychological telesupport), telerehabilitation and remote monitoring of cardiovascular implantable electronic devices might be an option to improve both physical capacity and depressive symptoms.

**Purpose:** The aim of the study was to investigate the influence of HCTR on depressive symptoms and physical capacity in heart failure (HF) patients in comparison with usual care (UC) alone.

**Methods:** The present analysis formed part of a multicenter, randomized trial that enrolled 850 HF patients (New York Heart Association class I–III, left ventricular ejection fraction  $\leq 40\%$ ). Patients were randomized 1:1 to HCTR plus UC or UC only. Patients underwent either an HCTR program (1 week in hospital and 8 weeks at home; exercise training 5 times weekly) or UC with observation. The psychological intervention in the HCTR group included supportive psychological counseling via mobile phone. The Beck Depression Inventory II (BDI II) score (cut point for depression  $\geq 14$ ) was used to assess depression and the physical capacity was measured by

peak oxygen consumption (peak VO<sub>2</sub>). Measurements were made before and after a 9-week intervention (HCTR group)/ observation (UC group).

**Results:** Both groups were comparable in terms of demographic, clinical characteristics and medical therapy. In HCTR group at entry 23% of the sample (n=88/382) obtaining BDI-II scores  $\geq 14$  vs 27.5% (n=107/389) in UC group. The BDI II score at study entry was  $9.8 \pm 6.6$  and after intervention was  $9.2 \pm 6.6$ ,  $p=0.016$  (HCTR group) vs at entry  $10.6 \pm 8.2$  and after observation  $10.0 \pm 8.3$ ,  $p=0.022$  (UC group). There were no significant differences between groups regarding  $\Delta$ BDI II score  $p=0.992$ . There was a significant improvement in physical capacity assessed by peak VO<sub>2</sub> only in the HCTR group, both in patients with ( $p=0.033$ ) and without ( $p<0.001$ ) depression (Table 1). These beneficial effects have not been observed in UC group.

**Conclusions:** In heart failure patients, HCTR provided similar reduction of depressive symptoms as UC. Hybrid comprehensive telerehabilitation resulted in a significant improvement in physical capacity both in patients with and without depression.

**Table 1.** Relationships between physical capacity and depression.

peak VO <sub>2</sub> (ml/kg/ min)	Hybrid Comprehensive Telerehabilitation Group				Usual Care Group				p <sup>3</sup>
	N	Before	After	p <sup>1</sup>	N	Before	After	p <sup>2</sup>	
BDI II < 14	292	17.12 ± 5.7	18.20 ± 5.87	<0.001	279	17.04 ± 5.85	17.16 ± 5.61	0.600	<0.001
BDI II ≥ 14	88	15.42 ± 4.52	16.09 ± 4.74	0.033	106	15.44 ± 5.66	15.50 ± 5.92	0.804	0.130
		0.011	<0.001			0.016	0.011		

Comparison of outcomes before and after telerehabilitation in the Hybrid Comprehensive Telerehabilitation Group (p<sup>1</sup>) and before and after observation in the Usual Care Group (p<sup>2</sup>) and between groups (p<sup>3</sup>).