

INTRADIALYSIS NEUROMUSCULAR ELECTRO STIMULATION, MUSCLE STRENGTH, FUNCTIONAL CAPACITY AND BODY COMPOSITION

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BACKGROUND

- ✓ Haemodialysis (HD) patients presents great muscle wasting.
- ✓ Recently, (NMES) neuromuscular electrostimulation becomes as adjunctive exercise treatment in HD patients.
- ✓ The exclusive NMES role and body composition in HD have not been published.

OBJECTIVE

Analyze the intradialysis quadriceps NMES's effect in muscular strength, functional capacity and body composition in our HD patients.

MATERIAL AND METHODS

A 12 weeks single-center prospective study.

NMES was performed using Compex® Thetha 500i device

-Analyzed:

- 1.-Nutritional data.
- 2.-Quadriceps muscular composition.
- 3.-Maximum length quadriceps strength(MLQS), hand-grip (HG)
- 4.-"Sit-to-stand-to-sit"(STS10) and "six-minutes walking test"(6MWT).
- 5.-Body composition.



Hand Grip Measurement



6MWT test



Intradialysis Quadriceps NMES



Body Composition (Electrical Biomimpendance)

RESULTS

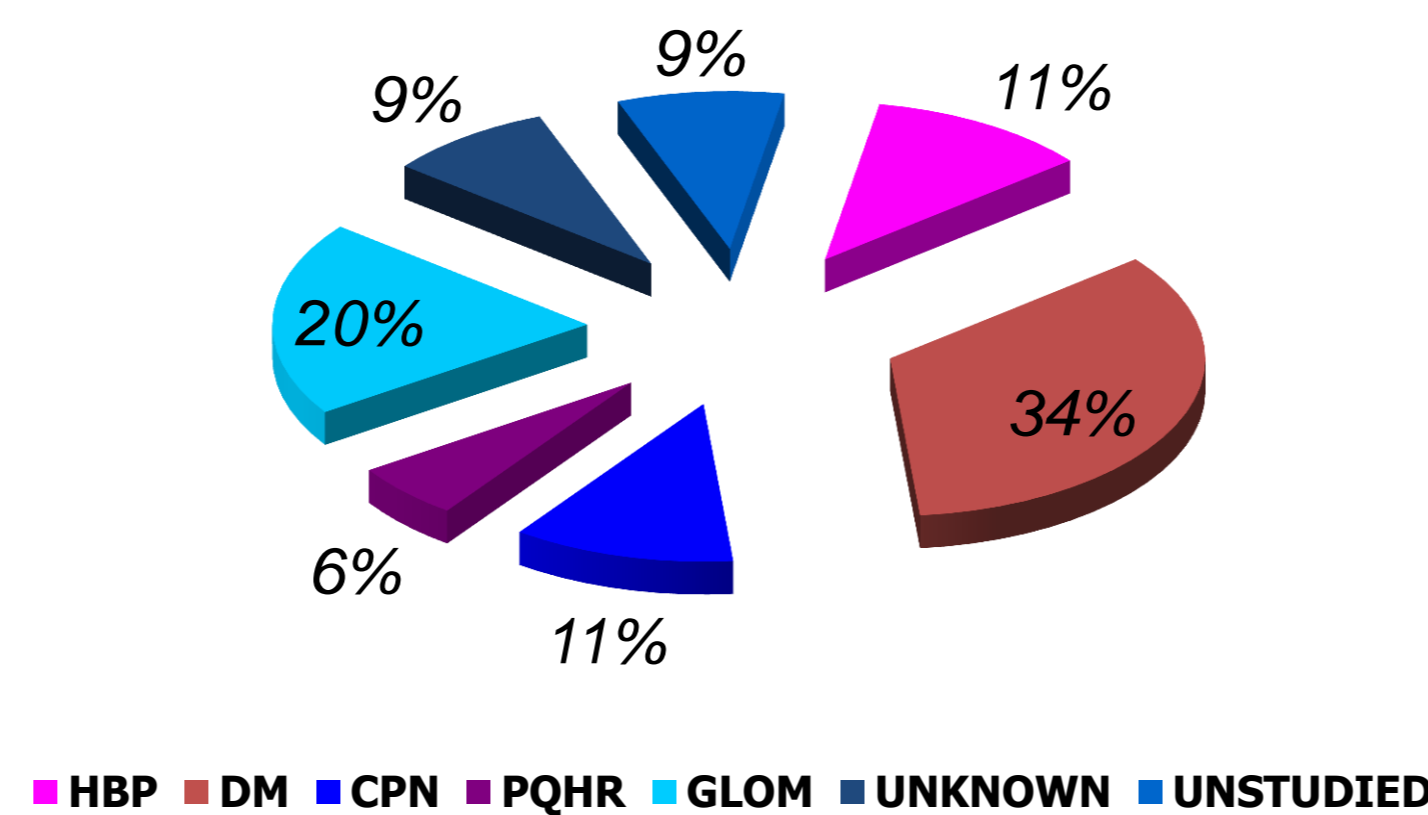
-13 HD patients included

69.2% men

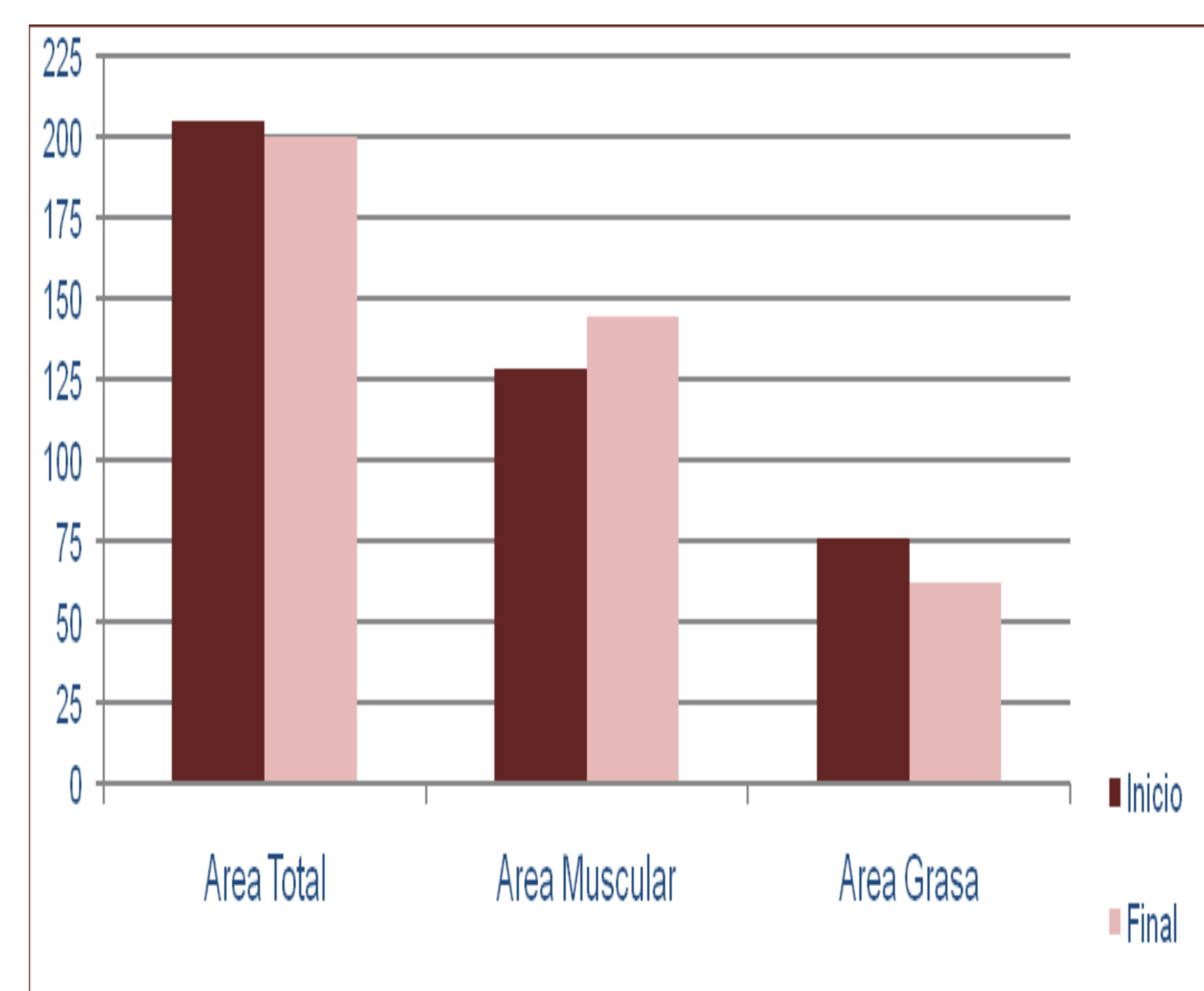
I. Charlson. 9.1 ± 2.3

Mean Age: 65.7 ± 12.8

Months on HD: 33.9 ± 24.7



QUADRICEPS MUSCULAR AREA



	Start	Final	Sig. Est
Total area	205.2±39.1	200.7±34.7	0.472
Muscular area	128.6±30.3	144.6±22.4	0.032 *
Fat area	76.5±26.96	62.1±20.1	0.024 *

A significant increase in quadriceps muscular area was observed after NMES

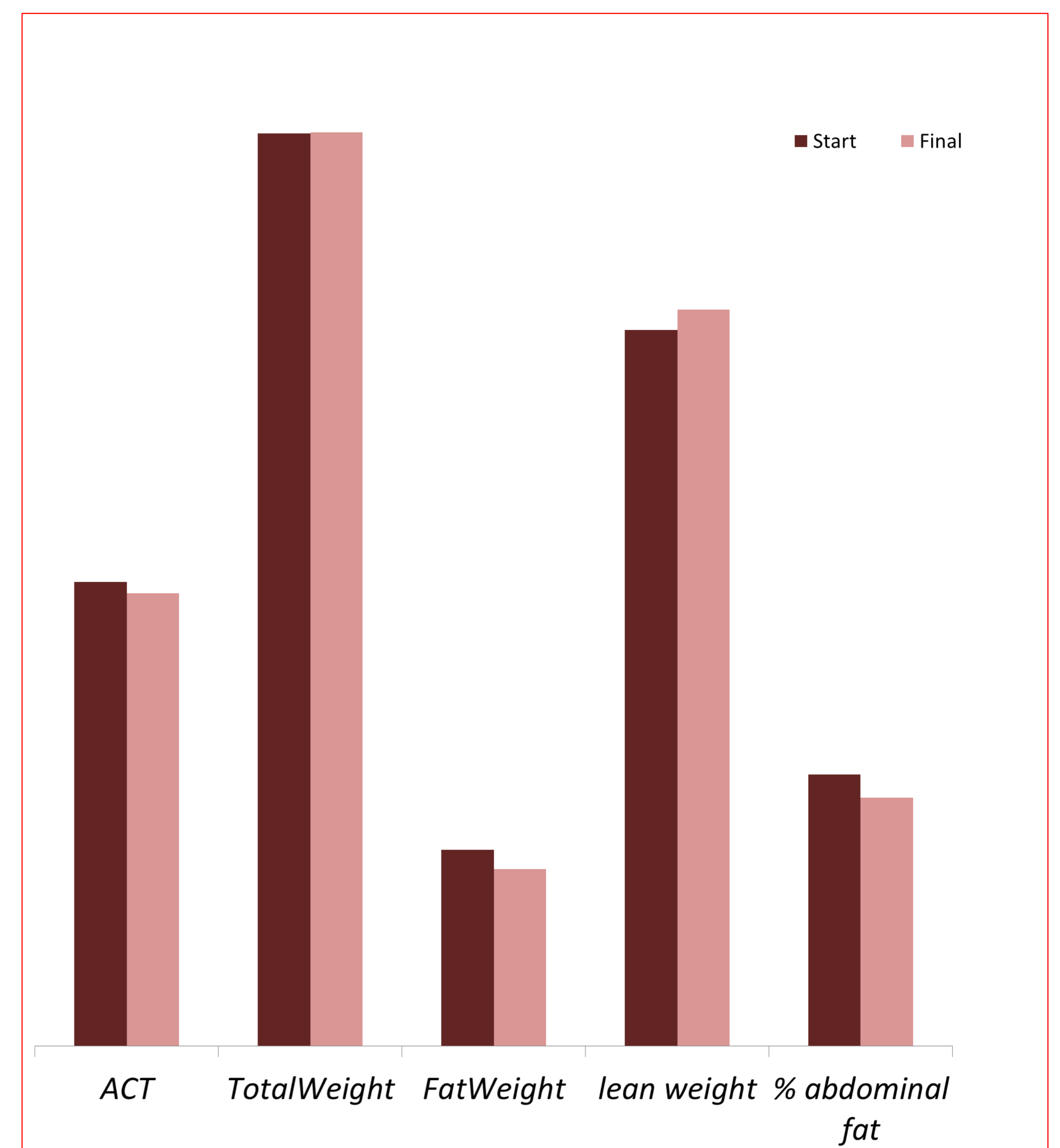
Anthropometric measurements formula (Gurney & Jelliffe): Quadriceps Total Area(ATQ) = [(Muscle contour(cm))² / 4π. Quadriceps Muscular Area (AMQ) = [(Muscle contour(cm) - π Muscle skinfold (cm))² / 4π. Quadriceps Fat Area (AGC) = Total Area(ATQ) - Muscular Area (AMQ).

MUSCLE STRENGTH AND FUNCTIONAL CAPACITY

	Start	Final	Sig. Est.
HG	21.2 ± 9.3	21.6±9.8	0.616
FEMQ	11.7±7.1	13.4±7.4	0.002*
6MWT	293.2±163.9	325.2±176.4	0.018*
STS10	39.3±15.5	35.8±13.7	0.310

A significant increase in quadriceps in MQLS and 6MWT was observed after NMES

BODY COMPOSITION



	Start	Final	Sig. Est
ACT	36.4 ± 4.9	35.5 ± 6.3	0.534
Total Weight	71.6 ± 9.8	71.7 ± 10.5	0.817
Fat Weight	15.4 ± 7.8	13.9 ± 7.7	0.278
Lean Weight	56.2 ± 10.9	57.8 ± 11.6	0.247
Body Abdominal fat	21.3%	19.5%	0.262

No significant differences in body composition were observed after NMES

Total weight.; Fat weight = [total weight(kg) x %Body Abdominal fat]/100. Lean Weight= Total weight(kg) - Fat Weight. Total body water was estimated according Watson's procedure

CONCLUSIONS

- 1.-EMS improved muscle strength, functional capacity and quadriceps muscle composition in our HD patients.
- 2.-Our results underline the local aspects on EMS, given the absence of relevant changes on nutritional parameters and body composition.
- 3.-Future studies are mandatory to establish EMS as a new alternative to prevent muscle atrophy and progressive functional deterioration of these patients.