

EXERCISE TRAINING, NUTRITIONAL PARAMETERS, BODY COMPOSITION AND HORMONAL ANABOLIC SYSTEM IN HEMODIALYSIS PATIENTS

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BACKGROUND

•Haemodialysis (HD) patients are characterized by great muscle wasting, decreased physical function and poor quality of life.

•Scarce studies about the relation of physical exercise with body composition and the hormonal anabolic system in HD patients have been published.

OBJECTIVES

To analyze if an intradialysis training program could improve muscular strength, body composition, nutritional parameters and the hormonal anabolic system in these patients.

MATERIAL AND METHODS

- A 12 weeks single-center prospective study.
- HD patients were assigned into an exercise training (ET) or control group (C).
- ET included a combined physical fitness using balls, weights, elastic bands and cycle movements in the first two hours of every HD session.
- C group received standard HD care.
- All subjects were evaluated at baseline and at the end of the study using the following data:
 - 1.- Biochemical parameters.
 - Nutritional data: albumin, prealbumin, ferritin and C Reactive Protein (CRP).
 - Lipid profile: triglycerids, total cholesterol and fractions)
 - 2.- Muscular data:
 - Maximum length quadriceps strength (MLQS)
 - "Hand-grip (HG) dominant arm.
 - 3.- Functional capacity tests:
 - "Sit to stand to sit" (STS10)
 - "six-minutes walking test" (6MWT).
 - 4.-Body composition:
 - Electrical biompedance (BIA).
 - 5.- Anabolic Hormonal system:
 - Insulin Growth Factor-I (IGF-I)
 - IGF Binding Protein 3 (IGFBP-3)
 - Ratio IGF-I/IGFBP-3.

RESULTS

DEMOGRAPHICAL DATA

Included patients: 34 patients (53% men)
 Mean age: 72.2± 18.4 years
 Time on HD treatment: 60.5 months
 20 ET group / 14 C group

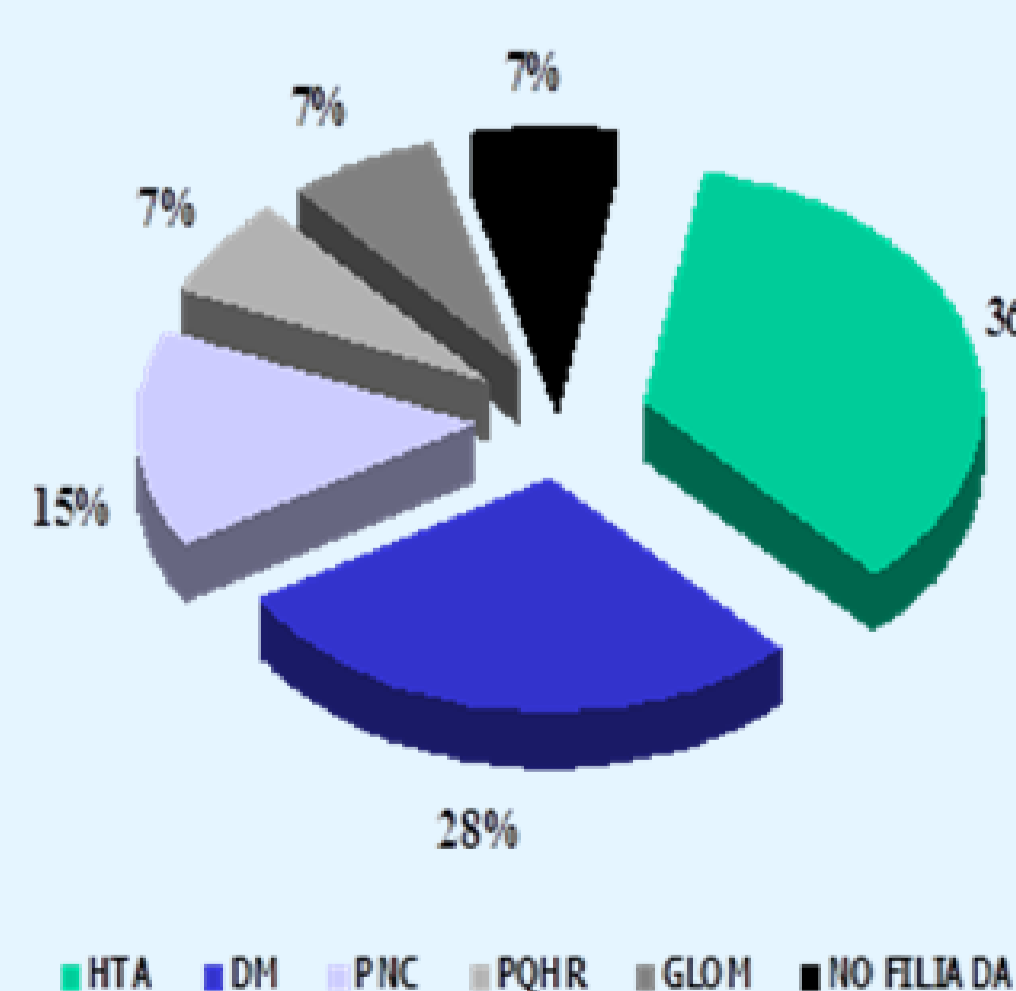


Figure 1.- Main patients on HD (%) ESRD aethiology

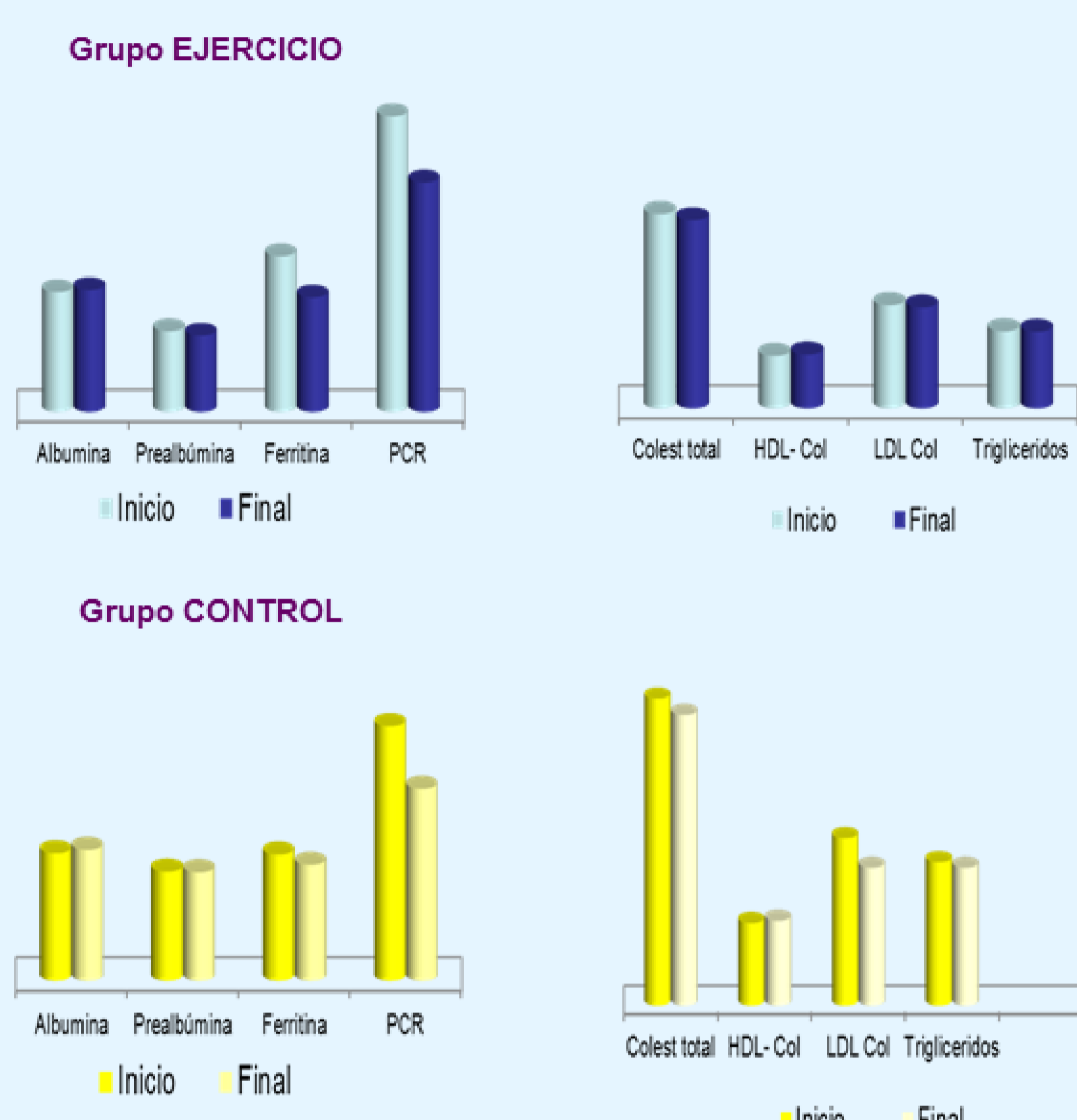
BASELINE DEMOGRAPHICAL DATA

	EJERCICIO (20 pacientes)	CONTROL (14 pacientes)
Edad (años)	69.3 ± 15.9	76.5 ± 8.1
Tiempo HD (meses)	58.8 ± 70.1	66.7 ± 98.8
Sexo (H) (%)	52%	54%
Ind. Charlson	8.5	9.1
NAE (%)	40 %	32%
DM (%)	28 %	31%
IMC	25.1	26.3
TA (mmHg)	133/78	133/73

"No differences between groups regarding demographical data were found at baseline study"

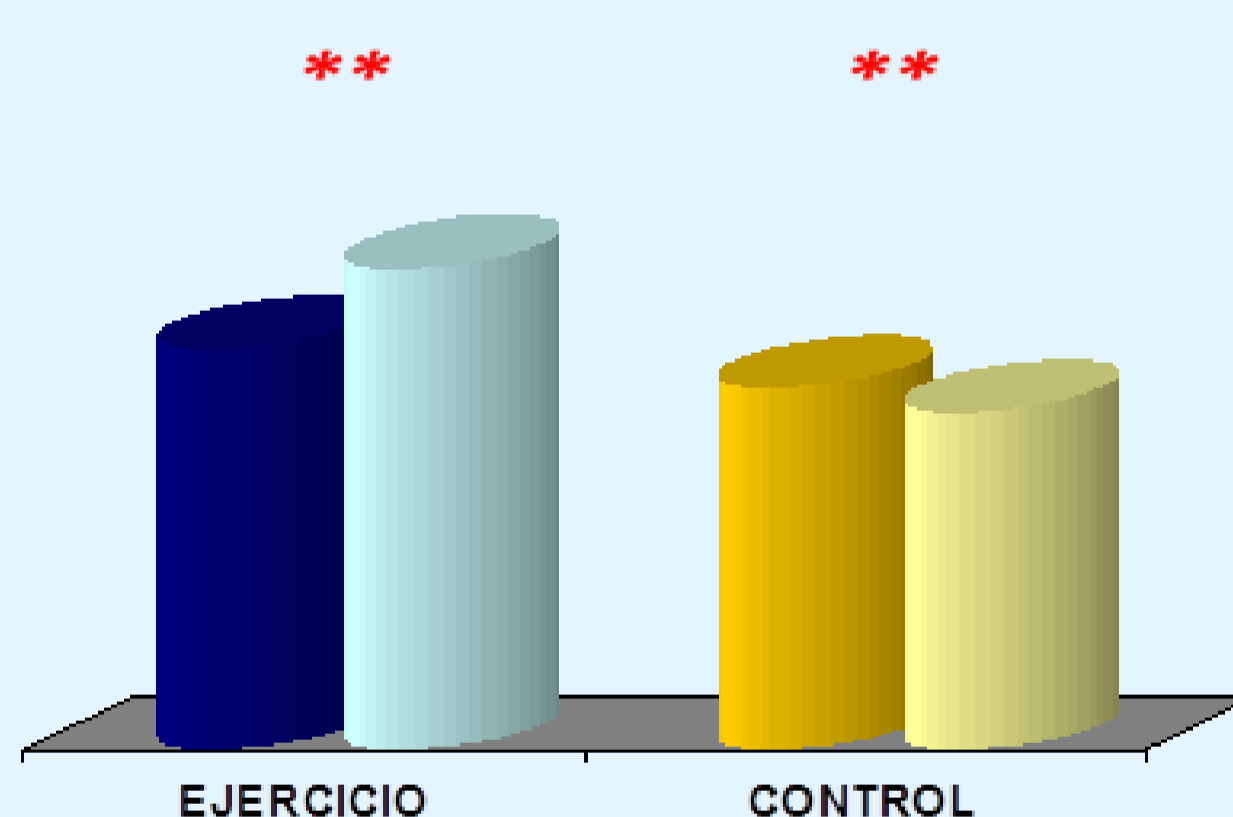
Table 1.- Main baseline demographical data, comorbidities and aethologies in our HD patients

NUTRITIONAL AND LIPIDIC DATA



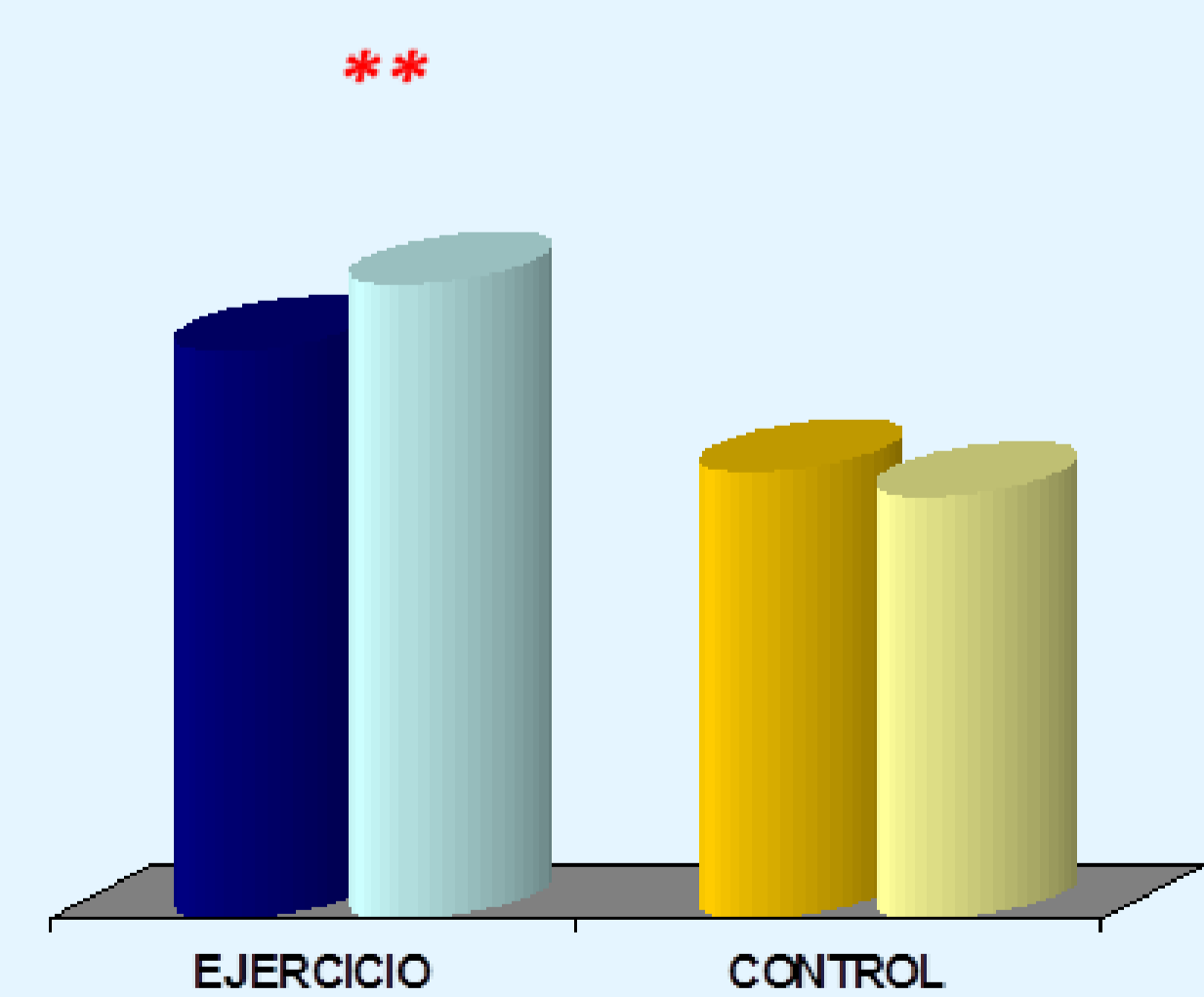
"No differences between groups regarding nutritional and lipid profile biochemical data (not shown) were found at the end of the study"

MUSCULAR DATA



HG	Inicial	Final	SE
Ejercicio	24.6 ± 14.3	26.1 ± 14.2	0.001
Control	21.2 ± 10.4	19.6 ± 11.1	0.003

Figure 2.- Hand Grip Dominant Arm (HG). Differences between groups during the study



FEMQ	Inicial	Final	SE
Ejercicio	15.2 ± 9.9	18.4 ± 11.6	0.002
Control	12.4 ± 6.7	11.1 ± 5.1	0.389

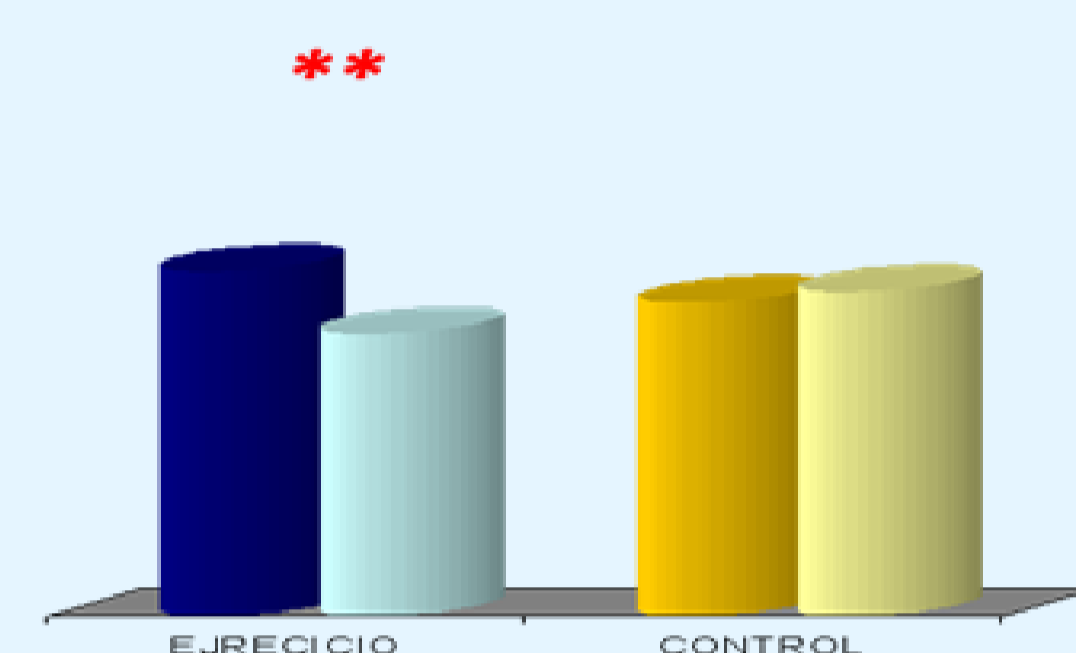
Figure 3.- Maximum Length Quadriceps Strength (MLQS). Differences between groups during the study

FUNCTIONAL CAPACITY TESTS



6minWT	Inicial	Final	SE
Ejercicio	370.8 ± 192	435.1 ± 211	0.002
Control	239.4 ± 109	237.7 ± 127	0.862

Six minutes Walking Tests



STS10	Inicial	Final	SE
Ejercicio	23.8 ± 10.4	20.1 ± 8.2	0.018
Control	41.7 ± 13.4	43.8 ± 12.7	0.122

Sit to Stand to Sit 10

Figure 4.- Functional capacity Tests: Sit to stand to sit 10 and 6MWT. Differences between groups during the study

BODY COMPOSITION



Figure 5.- Body composition (BIA): Differences in ET group during the study

ANABOLIC HORMONAL SYSTEM

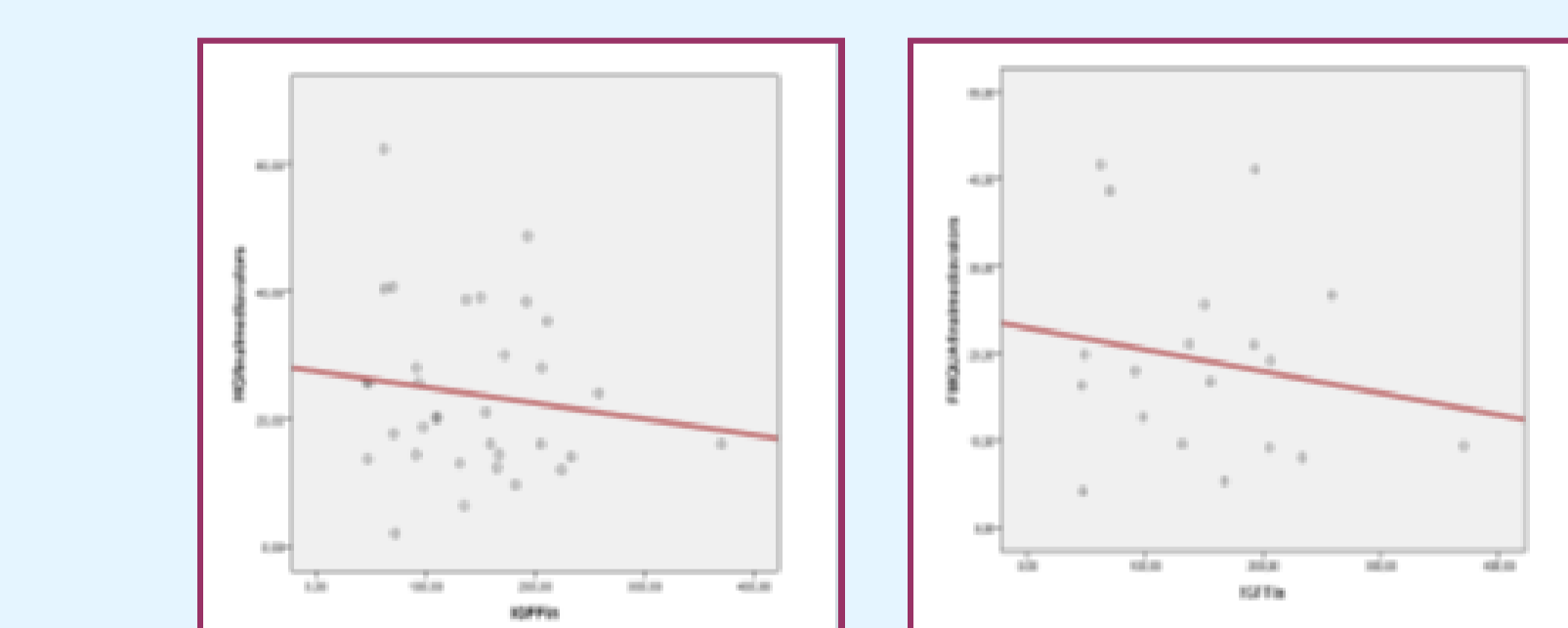
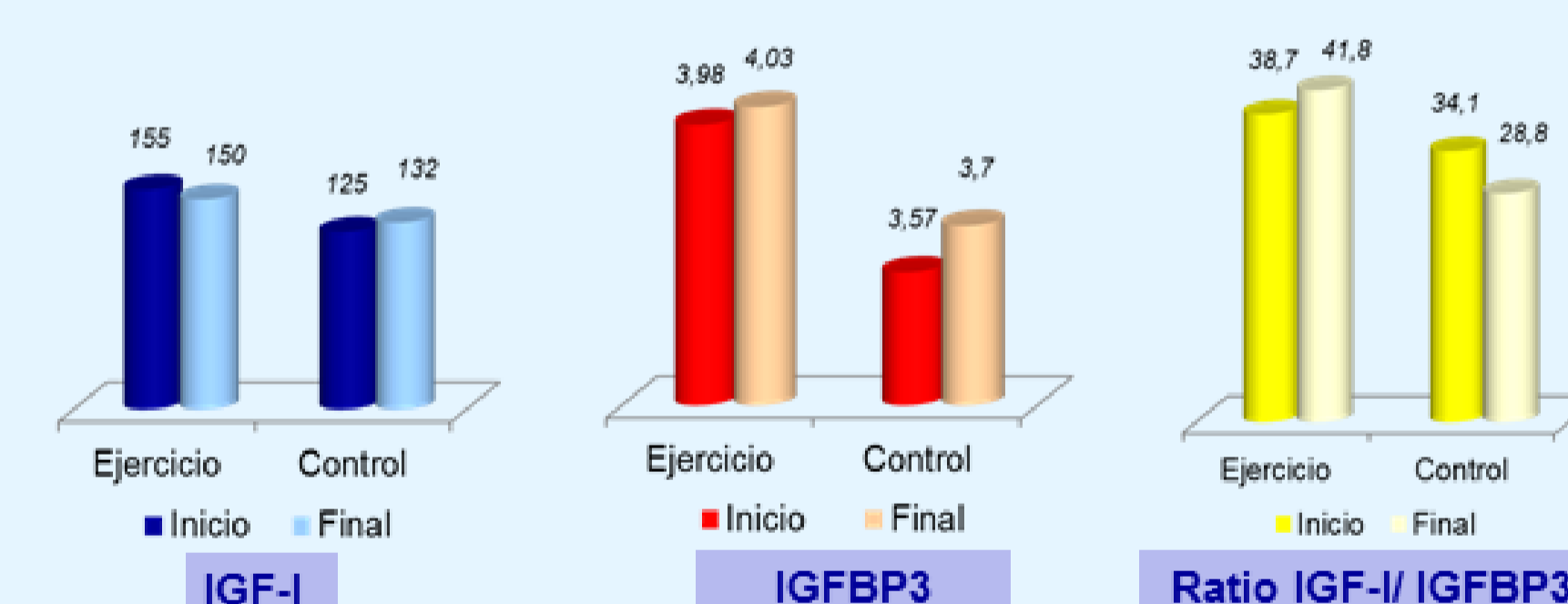


Figure 6.-Hormonal Anabolic system: Differences between groups during the study (ng/ml values expressed)

CONCLUSIONS

1.-Although exercise training was beneficial in terms of physical function, muscular strength and body composition, we did not found relevant changes on serum biochemical data and the hormonal anabolic system in our HD patients.

2.- Nevertheless, the results observed regarding the anabolic hormonal system, as described in the literature, could reflect a favorable anabolic neuromuscular adaptation in these patients.