

HANDGRIP STRENGTH AS A PREDICTOR OF DEATH IN INCIDENT HEMODIALYSIS PATIENTS OF DIFFERENT AGE GROUPS: A 6-YEAR COHORT STUDY (PROHEMO Study)

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I. Background

- We have previously shown evidence that a single measure of handgrip strength (HGS) by a dynamometer could help to identify maintenance hemodialysis (MHD) patients at higher risk of malnutrition.¹
- There is evidence that lower HGS is associated with higher mortality risk in MHD patients², but it is not clear if it applies to incident patients and if it changes between different age groups.

II. Objective

- To investigate if HGS was similarly associated with mortality between patients of two different age groups (<60 and ≥60 yr) on hemodialysis for less than 6 months.

III. Methods

- Prospective cohort study from 2006 to 2009 of 173 adult Brazilian MHD patients (108 men and 68 women) enrolled in the PROHEMO study, which is developed at 4 dialysis centers in the city of Salvador, Brazil.
- Baseline measure using a dynamometer (Takei Scientific Instruments, Japan). HGS was categorized into low and high groups based on sex-age specific median values (18 kg for women <60 yr, 13 kg for women ≥60 yr, 30 kg for men <60 yr and 22.7 kg for men ≥60 yr)
- Cox's proportional hazard models specific for patients with ages <60 yr and ≥60 yr were used to estimate hazard ratio (HR) of the association between HGS and all-cause death.
- The Kaplan-Meier method was used to construct cumulative survival curves for the handgrip groups separately for patients with ages <60 and ≥60 years. The log-rank test was used to estimate the type I error for the comparisons of the survival curves.

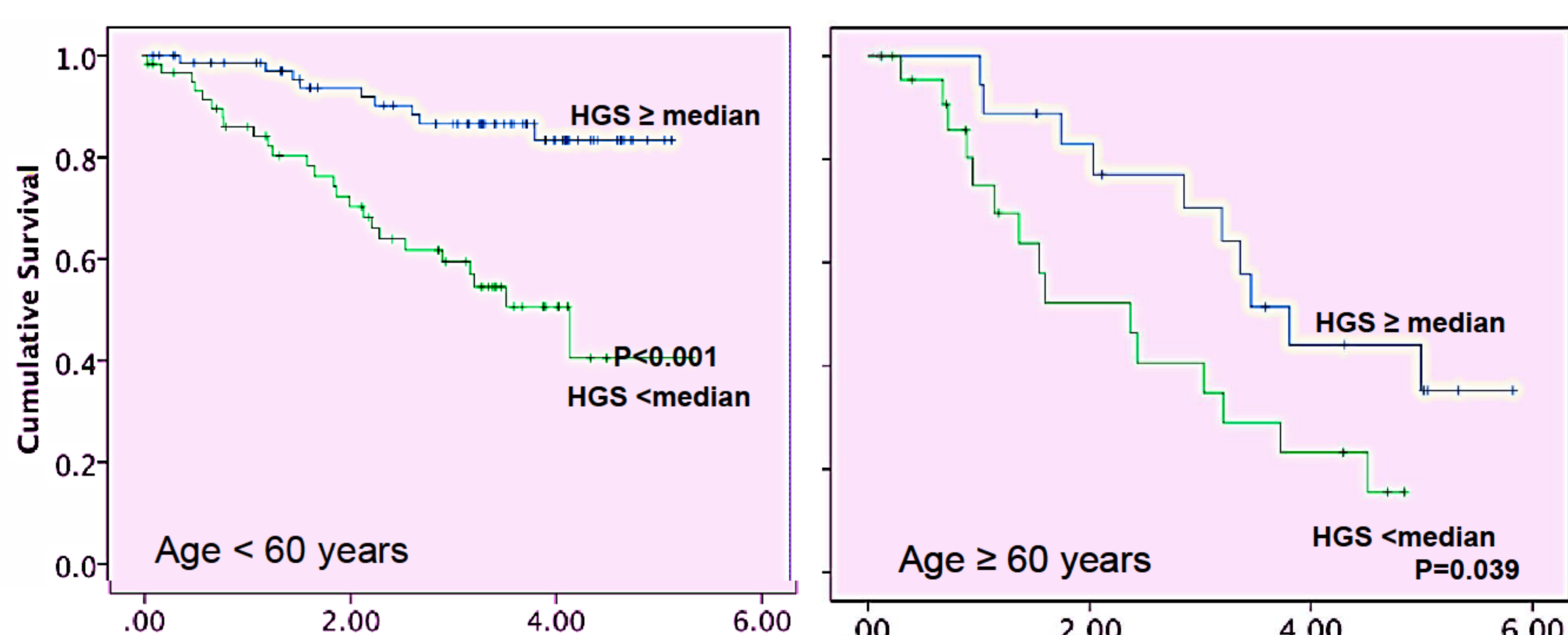
IV. Results

Characteristics of the patients by age groups and the median of handgrip strength

	<60yr (N=133)	≥60yr (N=43)	HGS<median	HGS≥median
Age (mean±SD)	43.21 ± 11.31	68.17 ± 7.0	54.3 ± 13.59	44.7 ± 14.74
Albumin (mean±SD)	3.78±0.60	3.57±0.85	3.66±0.75	3.79±0.60
Creatinine (mean±SD)	10.51±3.9	8.04±3.5	9.80±3.82	10.04±4.09
Hemoglobin (mean±SD)	8.38±1.82	9.47±1.73	8.37±1.89	8.91±1.82
HGS (mean±SD)	27.2±10.4	19.12±8.0	18.23±6.16	31.62±9.49
Men (%)	60.2	65.1	60.7	62.0
Non-white (%)	85	74.4	78.6	85.9
Diabetes (%)	28.7	51.2	48.1	21.3
Heart Failure (%)	12.4	15	13.6	12,5

Red numbers: p<0.001 ; Blue numbers: p<0,05

Cumulative survival for patients with handgrip strength (HGS) < the median and ≥ the median value



Hazard ratios of the associations between handgrip strength (< median vs ≥ median) and death

Age Groups	Death per 100 person-yr	Hazard Ratios (95% CI)	
		Unadjusted	Adjusted*
< 60 yr	5.9	4.24 (2.01-9.33)	3.25 (1.43-7.41)
≥ 60 yr	18.7	2.34 (1.02-5.38)	2.37 (0.93-5.99)

* adjusted for age, sex, diabetes, heart failure, albumin, creatinine and hemoglobin; CI means confidence interval . P value <0.001 for death rates by age groups; The P value was 0.521 for the interaction coefficient of age*handgrip strength.

V. Conclusions

By using sex-age specific median cutoffs for HGS, these results from PROHEMO provide evidence that HGS is a useful tool to identify incident MHD patients of different age groups who are at higher risk of death.

VI. Reference

- Silva, L. F., Matos, C. M., et al. Handgrip strength as a simple indicator of possible malnutrition and inflammation in men and women on maintenance hemodialysis. Journal of Renal Nutrition :21(3), 235–45.
- Matos, C.M., Silva, L.F., et al. Handgrip Strength at Baseline and Mortality Risk in a Cohort of Women and Men on Hemodialysis: A 4-Year Study, Journal of Renal Nutrition: 24(3),157-162

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