

Sarcopenia, more that dehydration, may be associate to underweight Portuguese centenarians

Alda Pereira da Silva (M.D., MSc.)^{1, 2, 3, 4, 5}, Andreia Matos (BSc.)^{2, 5}, Ana Valente (Ph.D.)⁶, Ângela Gil (BSc.)^{2, 5}, Isanete Alonso (BSc., MSc.)^{2, 5, 7}, Ricardo Ribeiro (M.D., Ph.D.)^{2, 5, 8}, Gorjão Clara (M.D., Ph.D.)^{3, 4} Manuel Bicho (M.D., Ph.D.)^{2, 5}

¹Alameda Primary Care Health Center, Lisbon, Portugal; ²Genetics Laboratory and Institute of Environmental Health - ISAMB, University of Lisbon, Faculty of Medicine, Portugal; ³Universitary Geriatric Unit of Faculty of Medicine of Lisbon, University of Lisbon, Portugal ⁴Academic Medical Center of Lisbon - North of Lisbon Hospital Center; ⁵Institute of Rocha Cabral, Lisbon, Portugal; ⁶Atlantica University Nutrition Sciences Department and Institute of Environmental Health - ISAMB, University of Lisbon, Faculty of Medicine, Portugal; ⁷Nutrition division St Louis Hospital, Lisbon, Portugal; ⁸Molecular Oncology Group, Portuguese Institute of Oncology, Porto Centre OPorto, Portugal,

OBJECTIVES

1989, I Rosenberg defines sarcopenia as a decreases in muscle mass, one of the consequences of aging (1). 2010, appears a European Working Group on Sarcopenia in Older People (EWGSOP) (2):

Progressive and generalized loss of skeletal muscle mass and strength, or physical performance (gait speed), with a risk of adverse outcomes such as physical disability, poor quality of life and death.

Prevalence range from 4.4%- 94% across definitions (3).

Fat-free mass has a functional significance in aging.

The objective of this study was to evaluate the prevalence of underweight in a Portuguese population of centenarians and their relationship with dehydration or sarcopenia.

METHODS

Anthropometric data were obtained using standard procedures from 252 centenarians (100.26±1.99 years), 77.8% women (W).

Body composition was assessed by tetrapolar bioimpedance (Tanita® BC-420MA).

It was considered dehydration: total body water (TBW) (%) <45 (W) and <50 Male (M), and excess of fat mass (FM) (%): >35 (W) and >25 (M).

The fat mass index (FMIndex): FM (kg)/height (m²) and muscle mass index (MMIndex): MM (kg)/height (m²) were calculated.

Statistical methods: T-Student, ANOVA, Chi-square, linear correlation.

Table1. Frequency of total body water and body fat mass and BMI subgroup distribution in women and men.

	Overall N (%)	Women N (%)	Men N (%)	p value χ2 test
TBW <45% (⊖) or <50% (⊖)	21 (12.9)	19 (15.4)	2 (5.0)	0.087
Body fat mass >35% (⊕) or >25 (⊕)	10 (6.0)	6 (4.8)	4 (10.0)	0.225
Underweight (BMI<18.5)	61 (25.3)	54 (28.8)	7 (13.2)	
Normal weight (BMI>18.5 and <25)	148 (61.4)	114 (60.6)	34 (64.2)	0.014
Overweight (BMI≥25)	32 (13.3)	20 (10.6)	12 (22.6)	

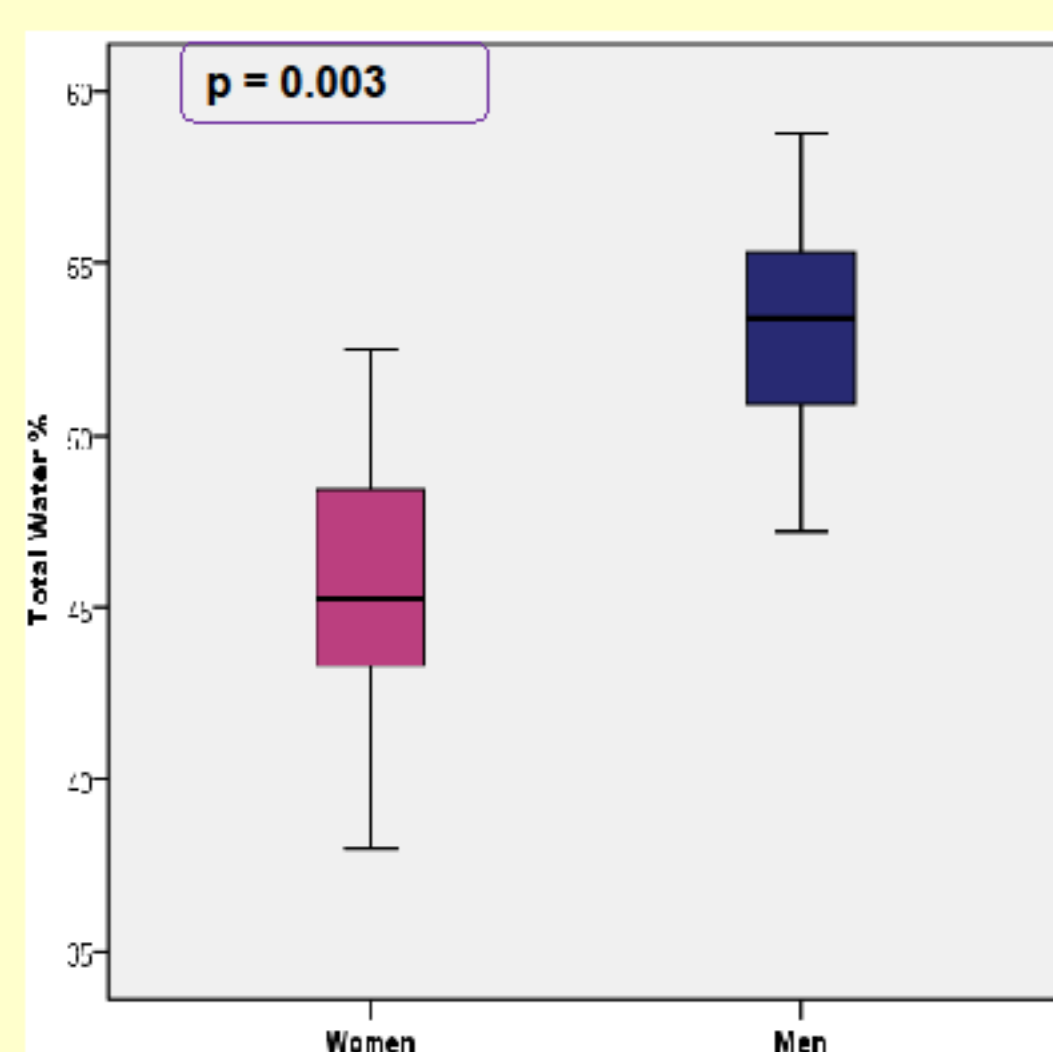


Fig 1. Level of hydration in women and men of global sample

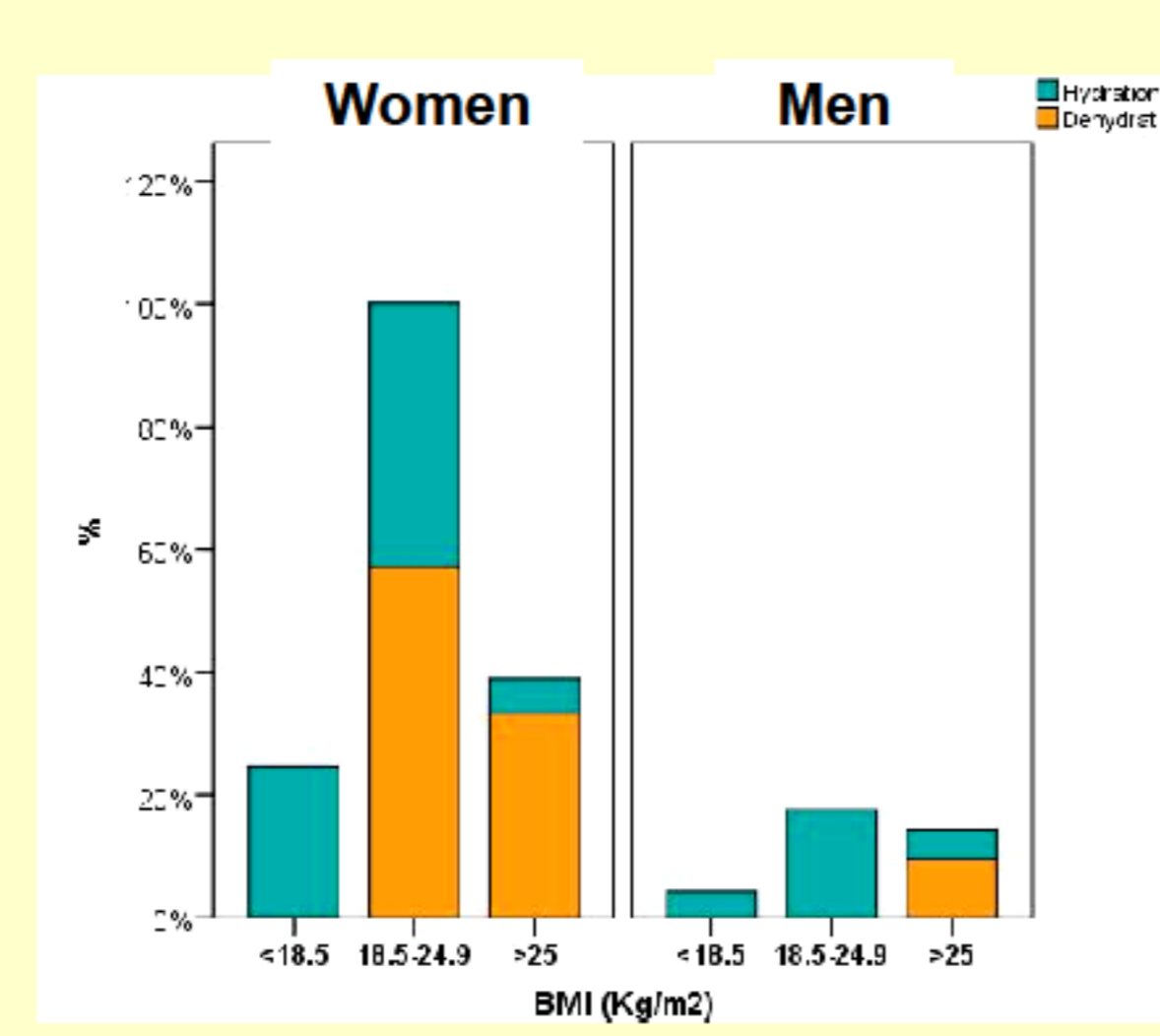


Fig 2. Frequency of dehydration in women and men according to BMI

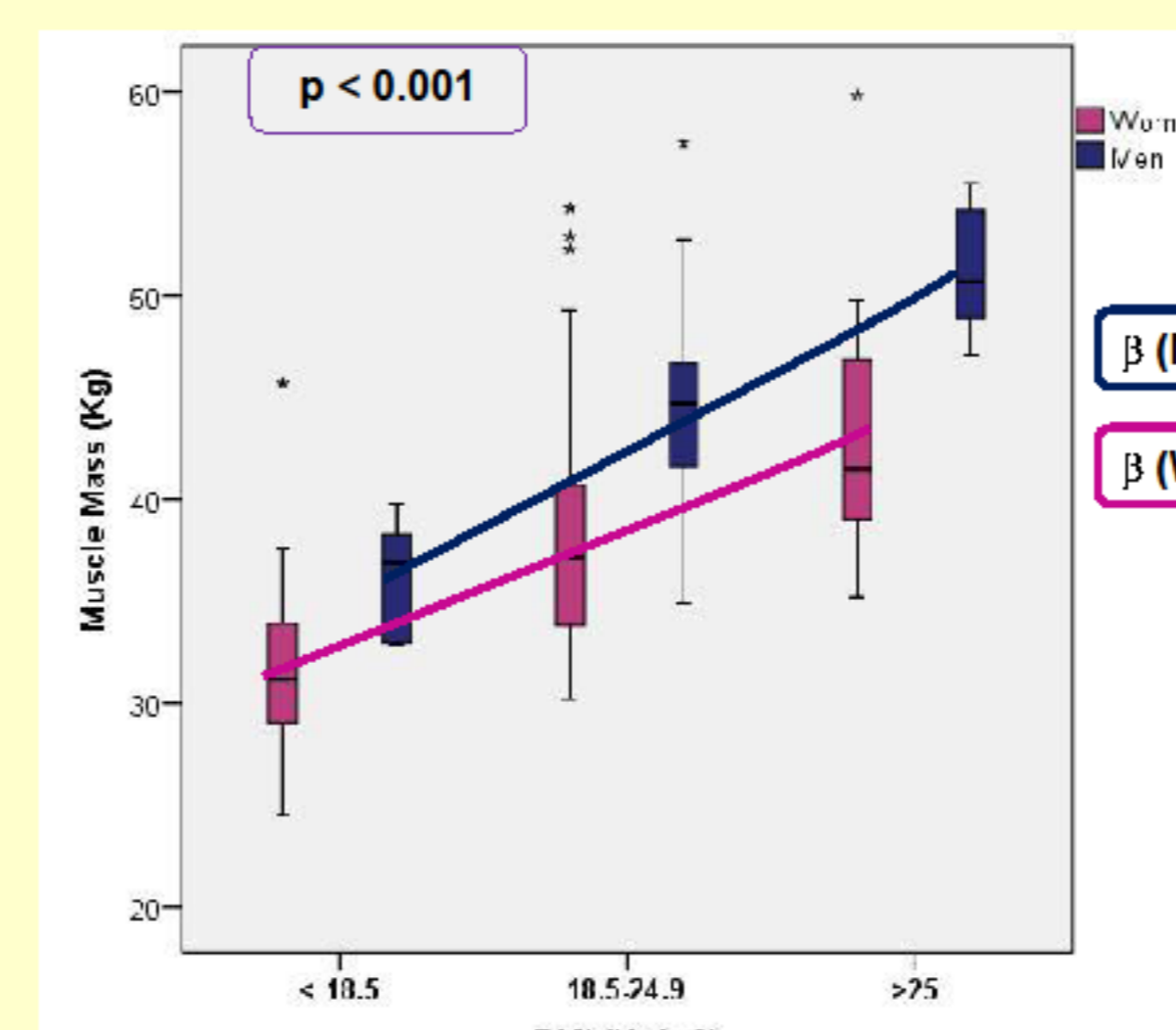


Fig 3. Muscle mass and BMI subgroup in women and men of global sample

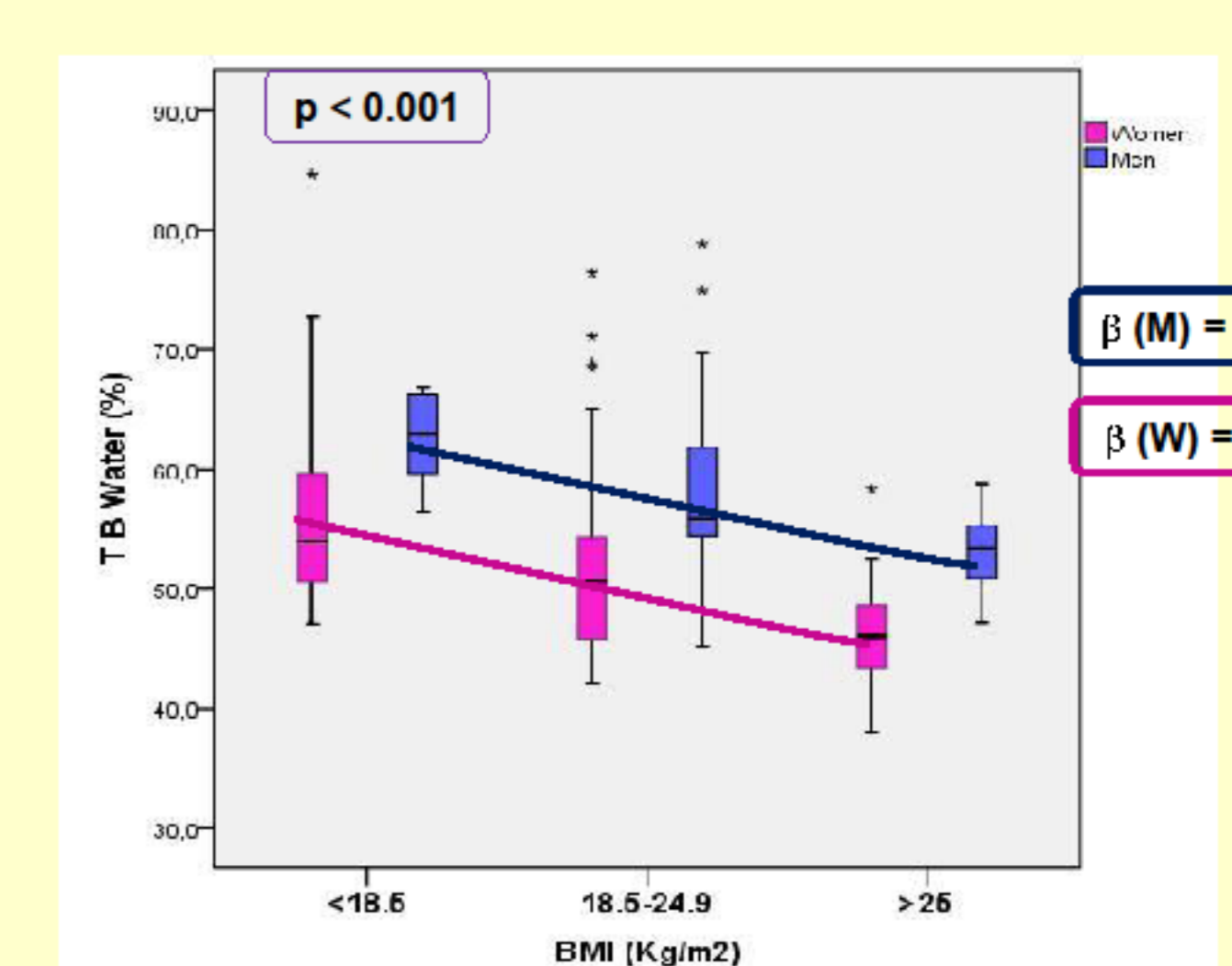


Fig 4. Total body water and BMI subgroup in women and men of global sample

RESULTS

In the sample, 61.4% had normal weight (BMI=21.42±1.86), but 25.3% were underweight (BMI=16.84±1.51), and of these, 28.8% were women. Instead, overweight (BMI=27.52±2.40) checked in 13.3% subjects, was predominant in men (10.6 vs. 22.6%) (Table 1). Men showed hydration levels superior to women (Fig. 1). Dehydration was observed in 12.9% of subjects and was tendentially higher in women (15.4 vs. 5.0%, p=0.087). Excess of FM was found in 6.0% of subjects with no gender differences (p=0.225) (Table 1). In the overweight subgroup there were differences in TBW (p = 0.003) and FM (p = 0.022) between genders, which was not observed in the underweight subgroup (Fig. 2). The FMIndex in underweight or overweight subgroups did not vary significantly with gender. Muscle mass and MMIndex were different between genders, with the lowest values observed in underweight W compared to M (31.7±3.96 vs. 36.3±2.84; p=0.01) or to the other subgroups. There was a direct linear correlation between BMI and MM ($\beta(M) = 0.749$; $\beta(W) = 0.683$) and inverse with TBW ($\beta(M) = -0.428$; $\beta(W) = -0.397$), men and women, p<0.001 (Fig 3 and 4).

DISCUSSION

Studies report that centenarians are usually thin (4). Height and weight of Portuguese centenarians are similar to reported anthropometric characteristics in Italian centenarians (5, 6). Looking at the results can be seen that the leaner individuals showed higher degree of hydration, but smaller muscle mass in relation to the other subgroups. The cut-off points, essential to define low muscle mass are in discussion. In Polish elderly individuals, are 5.52 kg/m² for females and 7.29 kg/m² for men (7), close to established by Beaudart 2014 for Caucasian Americans (8) and EWGSOP consensus (7.25-7.26 kg/m² for men and 5.5 - 5.67 kg/m² for women) (9).

CONCLUSIONS

The underweight was more represented in the Portuguese centenarians. More than body water and FM, sarcopenia may be responsible for this low weight particularly in the women.

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LISBOA UNIVERSIDADE DE LISBOA

ISAMB

CENTRO HOSPITALAR LISBOA NORTE. EPE

HOSPITAL DE SANTAMARIA

Hospital PulidoValente

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Alda Pereira da Silva

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