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Original Article

Nutritional Status and Body Composition of Elderly consultants in outpatient medicine in Casablanca – Morocco

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ABSTRACT

Objective: Senescence represents a public health disaster, which the nutritional profile is the main key to determine the status of seniors. The objective is the evaluation of the nutritional status and the body composition of the Moroccan elderly people of Casablanca. **Materials and Methods:** This is a cross-sectional survey of 62 people aged over 60 years, consulates in ambulatory medicine in a public Moroccan hospital, from January to April 2015, in Casablanca we used questionnaire to determine sociodemographic characteristics and the anthropometric indicators. **Results:** The 62 subjects in the study reported a sex ratio of 0.5 and an average age of 71.08, Significant male and female varieties were recorded for lean and fat mass measurements. Negatively significant correlations were found between BMI and total cell water. The model of the multiple descending linear regression showed that fat mass is a factor associated with total body water (beta = -0.1, p = 0.05) in the elderly of our study. **Conclusion:** we found that the nutritional status and the body composition of the elderly consultants in outpatient medicine were associated.

Key words: Elderly, nutritional status, body composition.

INTRODUCTION

All over the world, the age of the elderly (old people OP) of 60 years and over is increasing, it is estimated that in 2050 the number will exceed 2 billion people across the planet. Morocco is no exception, according to the Moroccan Office of the Plan, the number of older persons increased from 8% in 2004 to 9.6% in 2014, as result the support of senescence need a new approach in terms of public health for the kingdom authorities (1,2,3).

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It is proven that the nutrition occupies a major place in the cycle of life, especially among the elderly person. It is important to be aware that the situation of the health of the elderly person is in part affected by its nutritional profile because they suffer more of undernutrition, which is why there is a need to determine the nutritional status for either preventive or curative approach(4,5).

The evaluation of the nutritional status remains indispensable particularly among the OP with taking into account the main changes due to the age and repercussions of the general state of health and body composition in particular in the short and long-term(5,6,7).

In the light of these findings, there are only a few Moroccan studies in this subject; that is why we wanted to conduct a study to value the nutritional status of

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the elderly in Ambulatory medicine in a hospital in Casablanca. Morocco.

MATERIALS AND METHODS

This is an epidemiological inquiry cross on the nutritional status of the elderly consultant in Ambulatory medicine in a public hospital in the city of Casablanca conducted from January to April 2015.

Topics

A random 62 subjects, of men and women, aged 60 and over were selected from the database in the possession of the medical team of the service medicine at the hospital. This study has included elderly that not presenting any pathologies interfering with the body composition, such as, the presence of edema, the port of a pacemaker or the taking of diuretics. The subjects have formulated their informed consent for participation in the study informed of its goal and its conduct in accordance with the deceleration in Helsinki in 1964.

Data Collection

A questionnaire in face-to-face and a grid, previously tested and standardized, were used in this study to gather all of the data. The questionnaire focused on the sociodemographic characteristics of the patients, in particular, the age, sex, marital status and the education level, the grid allowed to identify the data relating to the measures of the anthropometric indicators namely the weight, size, the circumference of the calf, the brachial circumference and indicators of body composition including lean mass, fat mass, water, total cell, the intracellular water and extracellular water for each subject of the study.

Anthropometric Indicators

The measurement of anthropometric indicators have been carried out on two occasions by the same experienced investigator to minimize the variations intra-individual, with subjects heaved and wearing clothes light interiors. The measurement of the weight, size, of the brachial Circumference (BC) and the circumference of the Calf (CC) have been identified according to the standard techniques (WHO, 1995). The subject standing has been weighed on a scale Seca 761 to determine its weight in kg. Subsequently, the subject extends to determine its size which is calculated from the distance heel-knee According to the formula of Chumlea(8) using a paediatric spacer Seca 207. The report of the weight on the size allowed to calculate the Body Mass Index(BMI) kg/m^2. The values of the BMI were compared to the recommendations of the WHO(9).

$$\text{Height (Man)} = (2{,}02 \times \text{dHKcm}) - (0{,}04 \times \text{age}) + 64{,}19 \quad (1)$$

$$\text{Height (Women)} = (1{,}83 \times \text{dHKcm}) - (0{,}24 \times \text{age}) + 84{,}88 \quad (2)$$

dHK: distance heel-knee

Statistical Analysis

The quantitative variables were represented by the mean ± standard deviation (ET) whereas the qualitative variables were represented by the absolute frequency (n) and relative (%). The univariate analysis has appealed to the test of Pearson for the calculation of the coefficient of correlation between the indicators of body composition and anthropometric indicators. Student's t-test was used to compare the difference of the averages of the variables of interest between the two sexes. The multiple linear regression descendant used to determine the factors associated with anthropometries indicators and body composition in our sample.

The results were statistically significant when the P value was less than 0.05 and the statistical treatment was carried out with the SPSS software 20.0.

RESULTS

Description of the Sample

In this study, we had a total of 62 subjects, 31 men and 31 women, mean age, BMI and lean mass in respective 71.08±6.5ans, 26.2±4.8 kg/m2 and 64.3-±8.6 kg. The distribution of subjects in function of the age has been to 53.2 %(n=33) for the 60-69 years, 37.1% (n=23) for the 70-79 years, 9.7% (n=6) for 80-89 years.

Significant differences between the male and female subjects have been recorded in the measurement of indicators of body composition and anthropometric, including that of the lean mass ($p<0.001$), fat mass ($p<0.001$), total body water ($p<0.001$) and of the BMI ($p<0.001$). The whole of descriptive data of the sample is showed in the Table 1 (Table 1).

Table 1: General characteristics of elderly patients of the study

	Total (n=62)	Men (n=31)	Women (n=31)	P value
Marital status				
Married	54.8 (34)	77.4 (24)	32.3 (10)	<0.001
Not married	45.2 (28)	22.6 (7)	67.7 (21)	
Level of education				
Illiterate	77.4 (48)	64.5 (20)	90.3 (28)	0.49
Primary	17.7 (11)	29.0 (9)	6.5 (2)	
Secondary	4.8 (3)	6.5 (2)	3.2 (1)	
Middle of residence				
Urban	74.2 (46)	67.8 (21)	80.6 (25)	0.24
Rural	25.8 (16)	32.2 (10)	19.4 (6)	
BMI	26.2±4.8 (62)	24.6±4 (31)	27.4±5.0 (31)	0.02
Fat mass	34.9±8.7 (62)	28.3±5.9 (31)	41.5±5.6 (31)	<0.001
Lean mass	64.3±8.6 (62)	69.4±6.6 (31)	59.3±7.4 (31)	<0.001
Water total body	51.6±5.0 (62)	54.1±4.6 (31)	49.0±4.0 (31)	<0.001
Intracellular water	27.6±3.3 (62)	29.1±3.8 (31)	26.0±1.6 (31)	<0.001
Extracellular water	23.9±2.9 (62)	24.9±2.5 (31)	22.9±3.0 (31)	0.007
BC	27.2±3.8 (62)	26.7±4 (31)	27.2±3.2 (31)	0.3
CC	32.7±4.3 (62)	32.0±4.5 (31)	33.4±4.0 (31)	0.1

BMI : Body mass index ; BC : Brachial circumference; CC : Circumference of the calf

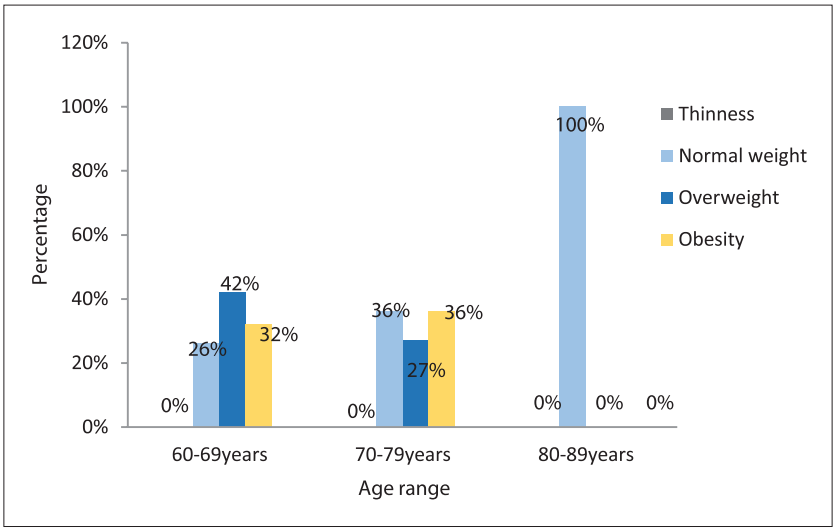

Figure 1: Distribution of BMI by age for women

BMI was used as an indicator of corpulence in the elderly, 1.6% (n = 1) in the sample represented a state of emaciation (BMI <16 kg/m2), 45.2% (n = 28) (25.0 kg/m2 <BMI <29.9Kg/m2), and 24.2% (n = 15) were overweight (18.5kg/m2 <body weight, body mass index (BMI> = 30 kg/m2).

The distribution of BMI for both sexes showed that overweight and obesity affects more women 63%, especially the 70-79 age group, compared to men only 8% (Figures 1 and 2).

As well as, the repair of recommended values of indicators of body composition, including the fat mass, total body water, and of the extracellular water was different between the two sexes of the study (Table 2).

Correlation between Anthropometric Indicators and Body Composition Indicators

Negatively significant correlations were found between BMI and lean mass (r = -3.1, p = 0.01, between BMI and total cellular water (r = -0.3, r = 0.003 (R = -0.3,

p = 0.002) and positively significant, between BMI and fat mass (r = 0.4, p = 0.001), between BMI and extracellular water CB (r = 0.6, p <0.001) and BMI and CM (r = 0.7, p <0.001). (R = 0.7, p <0.001), between ECT and lean mass (r = 0.5, p <0.001), and negatively significant between ECT and BMI (r = -0.3, p = 0.003) and between ECT and fat mass (r = -0.6, p <0.001).

Factors Associated with Body Composition

The quantitative and qualitative variables that demonstrated a significant correlation or difference in the univariate analysis were introduced in the model of the multiple descending linear regression to determine the factors associated with anthropometric indicators and body composition. Thus, 82% of body fat appears to be associated with total body water (beta = -0.1) in elderly outpatient consultants (p = 0.05).

DISCUSSION

The anthropometric parameters of the subjects, including BMI, calf circumference and brachial circumference were greater than the values recommended by WHO. All subjects in the study were overweight with a BMI greater than 25 kg/m2, which was higher in women with higher fat mass than the recommendations while MM and ECT were lower.

Table 2: Distribution of indicators of the body composition by sex

	Men (n=31)	Women (n=31)
Fat mass		
Normal	32.0 (10)	9.7 (3)
Superior to the standards	68.0 (21)	90.3 (28)
Lean mass		
Lower to the standards	90.3 (28)	90.3 (28)
Normal	9.7 (3)	6.5 (2)
Superior to the standards	0 (0)	3.2 (1)
Water total body		
Dehydration	93.5 (29)	58.1 (18)
Normal hydration	6.5 (2)	41.9 (13)
Intracellular water		
Dehydration	93.5 (29)	100 (31)
Normal hydration	6.5 (2)	0 (0)
Extracellular water		
Dehydration	71.0 (22)	29.0 (9)
Normal hydration	25.8 (8)	74.2 (23)

Our findings are consistent with those of a Moroccan study conducted in the same direction with PA, or 72.2% of women have a higher percentage of GP than normal, with MM and ECT lower than referential (7,10).

A high body mass profile with decreased lean mass in PAs is a predictive factor for muscle wasting, risk of sarcopenia and compromises the quality of life of subjects. This phenomenon highlights the profile of sarcopenic obesity affecting the elderly with significant weight status in our study (11,12,13).

The difference observed between the two sexes for body compartments and the anthropometric indicator goes hand in hand with the literature (14). A Swedish cohort found similar results in populations over 75 years of age (15). It appears that this difference in the anthropometric parameters between the two sexes can relate mainly to the anatomy and physiology of women and to the Moroccan culture where the elderly Moroccan woman are less active then men.

As far as the BC and CM measures seem to be similar between the sexes. But if certain authors have come to the same conclusion as ours, other authors have shown opposite results (16,17). We can hypothesize that a slight overweight tends not to influence the measures of the circumferences and does not affect them but studies need to be started in this direction.

Our results showed that the age group of 80 years and over registers the absence of an overweight or obesity BMI, we can assume that from this age onwards the main changes related to aging occur. This decrease in weight can be explained by the decrease in appetite and food intake with aging accompanied by an increase in metabolism without it being a corollary to an increase in dietary intakes as reported

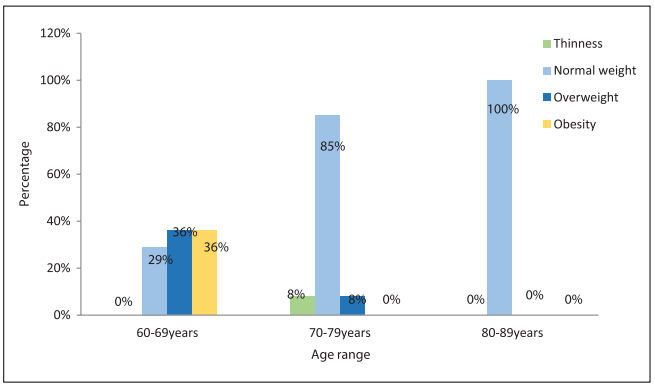

Figure 2: Distribution of BMI by age for men

by the Health ABC study (ABC = Aging and Body composition) (18,19).

Correlations were found between anthropometric indicators and body composition indicators, in this case, between BMI and MG, MM and ECT. Such relationships have been found in a study of 79 Moroccan elderly of both sexes (20,21).

Factors associated with body composition and anthropometric indicators indicated that MG is associated with ECT. It appears that the decrease in water induces an increase in fat main factor involved in comorbidity (20,21).

CONCLUSION

At the end of this study, the findings concerning the association between anthropometric indicators and body composition are an increased fat mass, a decreased lean mass and risk of dehydration. Thus, our study highlighted the importance of the evaluation of the nutritional status of the elderly consultant in ambulatory medicine. Longitudinal studies should be initiated to demonstrate a link between these two parameters, in order to limit all risks of late repercussions.

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