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Research Paper

Screening for malnutrition in elderly people hospitalized in the university hospital of Sidi-Bel-Abbes (western Algeria)

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Abstract

The aim of this work is to evaluate the nutritional status of a population of elderly patients hospitalized in the gastroenterology service of the University Hospital of Sidi-Bel-Abbes.Patients and methods. This is a descriptive and prospective study has been included in our work 50 patients aged 65 years and older. The evaluation is based on the anthropometric (body weight, height, BMI), biochemical (serum albumin) parameters and the score of screening Mini Nutritional Assessment screening (MNA®). The study population included 50 elderly subjects (27 women and 23 men). The average age was 77.96 ± 7.55 year. 100% live with family, the average length of stay in the hospital was 7.50 ± 3.09 days with a mean drug intake was 3.64 ± 1.65 drugs the most common disease is hypertension (55, 22%). The average BMI was 20.32 ± 3.85 kg/m^2 and the average albumin rate was 32.02 ± 7.47 g/L. BMI and serum albumin revealed respectively 62%, and 68% of malnourished elderly. The score of screening MNA® showed that 20% of patients are at risk of malnutrition and 80% were malnourished. The prevalence of malnutrition is very important and emphasizes the need for care of this age group especially in the gastroenterology departments.

Keywords: Elderly, hospital, nutritional status, anthropometric parameters, Mini Nutritional Assessment, Albumin.

Introduction

Algeria is experiencing an epidemiological transition characterized by an aging of the population. According to data from Algeria's National Statistics Office (ONS) in 2011, people aged 60 and over accounted for 7.7% of the total population, or 2,785,000 people. This figure is projected to reach 4.3 million in 2020, 6.7 million in 2030[1]. The aging of the body predisposes to a high incidence of malnutrition in the elderly regardless of their place of life and benefit if it is hospitalized. Malnutrition is in fact common in the elderly precarious or hospitalized population in the hospital, it concerns up to 70% of the elderly and the nutritional risk of elderly patients hospitalized is particularly high in subjects with a pathology that affects the digestive sphere[2,3]. The assessment of nutritional status should be systematic and repeated, using primarily clinical criteria such as weight measurement, body mass index, weight loss, anthropometric measures and body elements dietary history possibly combined in a score like the Mini-Nutritional Assessment (MNA®)[4]. The aim of this study is to evaluate the nutritional status of hospitalized elderly people in the gastroenterology department of the University Hospital Center (CHU) of Sidi-Bel-Abbès (Western Algeria) by measuring anthropometric parameters (weight, height, BMI), albumin and MNA®.

Materials and methods

The study was conducted over a 3-month, including 50 patients of both sexes aged 65 and older, hospitalized in the gastroenterology service of the University Hospital Center (CHU) of Sidi-Bel-Abbès (Western Algeria). The exclusion criteria were: persons under 65 years of age, disabled subjects and mentally ill, patients hospitalized during a day hospitalization, subjects with edema, ascites or anasarca, topics that were palliative, the absence of verbal communication, the physical impossibility to weigh and measure the subject and refusal of participation. All patients were informed of the purpose of the study and gave their consent. The Sociodemographic and anthropometric data as well as the MNA® were collected using a questionnaire during interview session. Reported chronic diseases and drug intake were collected through referring physicians and analysis of medical records. The body weight was measured with a minimum of clothing using an electronic scale (SECA, Germany) with an accuracy of ± 50 g, the height was measured in a vertical position, without shoes and heels together with a stadiometer for wall mounthing attached. BMI was calculated from the mass of weight and height and was expressed in kg/m². For the calculation of the MNA® screening score for each subject, the arm circumference and the calf circumference were measured with a 1 mm precision metric tape. The Serum albumin dosage was done using the colorimetric method (Bromcresol green)[5] the serum of fasting subjects. The MNA® score was calculated for each individual. Malnutrition was determined according to the criteria of HAS: albuminemia<35 g/L and/or BMI<21 kg/m² or MNA<17 and, it is considered as severe when serum albumin<30 g/L or a BMI<18 kg/m², the risk of malnutrition was assessed by the MNA® screening score of 17-23,50[6]. Data analysis was performed using IBM SPSS v23 software. The results were expressed for continuous variables as mean and standard deviation. The qualitative variables were presented as numbers and percentages. The comparison between the two sex groups was performed by the Student t-test or the Mann Whitney U-test, after verifying the normal distribution of the study sample. The link between the quantitative variables was established by the Pearson correlation. The comparison between the frequencies of malnutrition was performed by the Pearson Chi-square test. A significance level of p<0.05 was used.

Results and Discussions

The studied population consisted of 27 women and 23 men middle-aged 77.96±7.55 years. No significant difference was observed between the age of women (76.83±8.02 years) and men (78.93± 7.17 years). 100% of patients lived with their families. The average length of stay in hospital was 7.50±3.09 days with an average drug intake was 3.64±1.65 drugs (Table 1), hypertension affected more than half of patients (55,22%), 42,53% of the population had diabetes and 2,25% had cardiovascular disease. the BMI of the populations was 20.32±3.85 kg/m² with an average serum albumin level was 32.02±7.47 g/L. Significant differences were observed between men and women for height (p<0,05) they were no significant differences between the two sexes in regards to body weight, BMI, serum albumin, MNA®, length of stay in hospital and drug intake (Table 1).

Table 1: Characteristics anthropométric parameters, serum albumin and MNA® of the studied population

	Total population	Women	Men	Valeur p
	(n=50)	(n=27)	(n=23)	
Age (year)	77,96±7,55	76,83±8,02	78,93±7,14	0,332
Body weight (kg)	57,44±10,97	56,52±12,32	58,22±9,86	0,590
Height (m)	01,68±0,04	01,69±0,03	01,67±0,05	0.006**
BMI (kg/m²)	20,32±3,85	19,69±4,12	20,87±3,59	0,283
Albumin (g/L)	32,02±7,47	33,24±7,38	30,99±7,53	0,149
MNA®	12,34±4,72	12,00±5,05	12,63±4,52	0,644
Length of Stay (days)	07,50±3,09	07,78±3,62	07,26±2,61	0,821
drug intake	03,64±1,65	03,78±1,86	03,52±1,48	0,670

P <0.001**, BMI: Body mass index, MNA® : Mini Nutritional Assessment

Table 2 summarized the frequency of malnutrition when according to the screening tools used (BMI, albumin and MNA®). The results of BMI (BMI <21 kg/m²) showed that 62 % of our population were malnourished with severe malnutrition (BMI<18 kg/m²) in 26%. With an albumin<35 g/L, 68% were malnourished and 38% were severely malnourished (albumin<30 g/L). The MNA®score identified two subgroups: 80% were malnourished (MNA <17), and 20% were at risk of malnutrition (MNA: 17-23.50). The correlation analysis showed that in both sexes, female and male respectively, age was weakly and not significantly correlated with BMI (r=-192 et r=-199), albumin (r= 0,019 et r= -0,279), and at MNA®(r=-0,170 et r=-0,244) (Table 3).

Table 2: Frequency of malnutrition using BMI, serum albumin, and MNA®

	Total population	Women	Men	Valeur de p
	(n=50)	(n=27)	(n=23)	
Risk of malnutrition n (%)				
MNA: 17-23,50	10(20,0%)	06(22,2%)	04(17,4%)	0,943
Moderate malnutrition n (%)				
BMI<21 kg/m^2	31(62,0%)	14(51,9%)	17(73,9%)	0,109
Albumin < 35 g/L	34(68,0%)	19(70,4%)	15(65,2%)	0,697
MNA<17	40(80,0%)	21(77,8%)	19(81,6%)	0,943
Severe malnutrition n (%)				
BMI<18 kg/m^2	13(26,0%)	6(22,2%)	7(30,4%)	0,509
Albumin < 30 g/L	19(38%)	13(48,1%)	6(26,1%)	0,109

MNA®: Mini Nutritional Assessment, BMI: Body mass index.

Table 3: Correlation Coefficients between age, MNA®, anthropometric parameters, and serum albumin

	Femmes (n=27)				
	Age (ans)	Poids (kg)	IMC (kg/m^2)	Albumine (g/L)	MNA®
Age (ans)	-	-0,202	-0,192	0,019	-0,170
MNA®	-0,170	0,606**	0,677***	0,520*	-
	Hommes (n= 23)				
	Age (ans)	Poids (kg)	IMC (kg/m^2)	Albumine (g/L)	MNA®
Age (ans)	-	-0,206	-0,199	-0,279	-0,244
MNA®	-0,244	0,290	0,352	0,478*	-

MNA® : Mini Nutritional Assessment, IMC: indice de masse corporelle. P< 0.05*, P< 0.01**, P< 0.001***

The average age of the population (77.96 ± 7.55 years) is lower than that found in Canadian and Italian elderly populations, cited respectively by Mckenzie et *al*., 2009[7] and Rondanelli et *al*., 2018[8]. This age difference would be justified by the lower life expectancy of about 63 years in developing countries according to the United Nations, this can be explained by the poor quality of life According to Aperdjinou et *al*., 2012[9]. The prevalence of arterial hypertension observed in our study is less important than that found by Chami et *al*., 2015[1] and Omri et *al*., 2016[10] respectively in an Algerian and Tunisian population with a prevalence of 70%. However, the prevalence of diabetes (42, 53%) is high compared than that reported by Cerri et *al*., 2015[11] and Harboun, 2007[12], 20.4% and 35% respectively. The average length of stay in hospital (07.50 ± 3.09) is similar to that of a French study[13]. However, it is relatively short compared to most studies: Fanello et *al*., 2000[14] and SanzParís et *al*., 2013[15] respectively observed a length of stay of 10 days and 15.7 days. The number of drug

intake on average per patient is lower than that found by Manchon et *al*., 1989[16], Kharrat et *al*., 2017[17] and Belher et *al*., 2012[18] in elderly patients hospitalized. The average BMI of our population is much lower than those reported by Paillaud et *al*., 2001[19] (22.5 ± 4.3 kg/m2) and Serigne et *al*., 2018[20] (26.67 ± 9.17 kg/m^2) in French populations, and Aperdjinou et *al*., 2012[9] in a Togolese population (25 ± 4 kg/m^2). The detection of malnutrition by the MNA® shows that 80% of our patients are malnourished, this prevalence is much higher than that described in the literature[21-24.] Our result is comparable to that of an Italian study (74%)[25]. It was reported by Abd Aziz et *al*., 2017[24] that in Asia however, it was found that a ranged of 16%–78% of hospitalized elderly are malnourished (including those at risk of malnutrition) in between 2005 to 2012. Regarding the prevalence of malnutrition risk in our population (20%), it is similar to that of a study in Chicago[26] (24%) and Taiwan[21] (21.9%). Women are more exposed at the risk of malnutrition compared to men (22.2% vs. 17.4%), which is consistent with a study in Canada[27] with a prevalence of (37% vs. 29%). However, the BMI has detected a prevalence of malnutrition that is significant and much greater than that reported by Aperdjinou et *al*., 2012[9] and Kouassi et *al*., 2013[23] in Togolese populations and Mcwhirter et *al*., 1994[28] among an English population, who found 15.30%, 39% and 36% respectively. However, the prevalence of severe malnutrition (BMI<18 kg/m^2) (26%) is higher than that found in a Spanish study[29] (4.5%) and a study realized in Hong Kong[30] (16.7%). As for the detection of malnutrition by albuminemia, the prevalence is greater than that observed by NurFazimah et *al*., 2013[30] (16.9%), Sakinah et *al*., 2010[31] (26%) and Abd Aziz et *al*., 2017[24] (41.4%). Aperdjinou et *al*., 2012[9] report that the use of albumin as the sole diagnostic criterion, has allowed to observe a higher rate of malnutrition 77%.For many years, it has been reported that there is a relationship between the decrease in circulating proteins and the risk of morbidity and mortality. The latest meta-analysis on the subject, gathering 90 studies and nearly 300,000 patients, specifies that the risk of death is increased by 137% for each loss of 10 g/L albumin. Interestingly, this risk remains valid even after adjustments by the BMI. Thus, despite the nutritional status, Albuminemia reflects a risk of mortality. In addition, Hypoalbuminemia has been correlated with an increase in morbidity and mortality regardless of the pathology considered[32]. The correlation analysis revealed a negative and insignificant correlation between age and the MNA® score. This result is in contradiction with that of Amrouche et *al*., 2013[33] and Omri et *al*., 2016[10]. The MNA® score correlated significantly with albumin in both sexes. This result corroborates those of Fanello et *al*., 2000[14], Kouassi et *al*., 2013[23] and SanzParís et *al*., 2013[29]. However, a moderate and positive correlation was found between the MNA® scoreand BMI in women. In contrast, the MNA® score was weak and not significantly correlated with BMI in men, as corroborated by Drevetet *al*., 2014[34]. Our population has a high prevalence of malnutrition and appears to be particularly nutritionally vulnerable. This is confirmed by Cynober et *al*., 2000[3]. This especially true in subjects with a pathology that affects the digestive system. SanzParís et *al*., 2013[29] found that the prevalence of in-hospital malnutrition has been estimated to be between 12.5% to 78.9% in Spanish populations. The comparison of the prevalence rates of malnutrition detected by BMI, albumin and MNA® shows that malnourished subjects accounted for 62%, 68% and 80% respectively. This disparity in prevalence observed in the study population by the use of different screening tools was also reported by Fanello et *al*., 2000[14], who observed a prevalence that varies from 20% to 80%. In our study, the frequency obtained with the MNA® score is more credible than those of BMI and albumin. This is supported by the work of Abd Aziz et *al*., 2017[24], among an elderly population in the Philippines. Kouassi et *al*., 2013[23], have also shown that MNA®remains a test of good specificity for the diagnosis or confirmation of protein-energy malnutrition that can be used in both elderly subjects living at home and those who have come into consultation or hospitalized.

Conclusion

These alarming results should encourage the medical community to strengthen screening for the nutritional status of hospitalized elderly patients in order to better target their overall therapeutic management. This is why the High Authority for Health made the detection of malnutrition mandatory, which has since become an indicator of quality.

Conflict of interest statement

The authors declare that there is no conflict of interests.

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