Under nutrition In Obese Elderly Diabetic Patient

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Summary

Introduction

After the age of 65 years, 17% of patients are obese and 4 to 10% are undernourished. The number of elderly patients in both obese and undernourished is little known in the general population but also in diabetic patients.

Objective

This study was to assess the prevalence of under nutrition and describe the factors that influence nutritional status in obese elderly diabetic patients.

Patients and methods

We conducted a cross-sectional study between September 2016 and February 2018, including 120 type 2 diabetic obese, aged 65 and over, collected in our unit. Nutritional status was assessed by the Mini Nutritional Assessment and by serum albumin assay. Statistical analysis was performed by epi Info 0.6. Software.

Results

The average age of patients was 71 years, 66% were female. The mean BMI was 33.4 kg / m², 61% had at least a degenerative complications. Dyslipidemia was present in 51.6% of patients and hypertension in 58.3%. Malnutrition was found in 10.8% of patients and 28.3% were at risk of malnutrition. We found a significant correlation ($p < 0.05$) between undernutrition and poly medication, the cholesterol-lowering and diabetic diet, dyslipidemia, nephropathy and the presence of chewing or swallowing disorders.

Conclusion

Under nutrition of the obese subject is an unknown clinical entity whose prevalence will increase significantly, specific studies about undernutrition among obese elderly patients become necessary especially diabetics.

Keywords: Under nutrition; Sarcopenic obesity; Elderly; Diabetic; Risk factor; Consequence.

Introduction

After the age of 65 years, 17% of patients are obese and 4 to 10% are undernourished. The number of elderly patients in both obese and undernourished is little known in the general population but also in diabetic patients.

The diagnosis of malnutrition in older obese subjects is problematic, the definition and diagnostic criteria of undernutrition for non-obese subjects are at fault because of clinical, morphological and biological excessive adiposity [1,2]. However, risk factors exposing to malnutrition in elderly obese diabetics are the same as the normal weight for age, however, some clinical situations are more frequent in the studied population [3,4].

Patients and methods

We conducted a prospective observational and analytic study at the Department of Endocrinology and Metabolic Diseases, UHC Ibn Rochd Casablanca, extended over 18 months between September 2016 and February 2018.

Inclusion criteria

Any type 2 diabetic hospitalized at the service for chronic glycemic imbalance or for acute decompensation of diabetes after stabilization and any diabetic type 2 followed at the consultation, aged 65 years old and over (age of retirement in Morocco), whose BMI $\geq 30 \text{ kg/m}^2$, independent, without mental or memory

disorders. 120 diabetic patients were included.

Exclusion criteria

Type 1 diabetic patients, patients with age < 65 years old, with BMI <30 Kg/m², patients who refuse to be interviewed, non-autonomous patients and patients with psychic and / or memory disorders were excluded from the study.

Variables studied

- Sociodemographic features were studied such as age, sex and BMI. The socio-economic level was also identified.
- Regarding diabetes, the parameters assessed were the age of diabetes, the treatment used, the level of glycemic control (by the dosage of glycosylated hemoglobin (HbA1c) by standardized HPLC method) and degenerative complications.
- Nutritional status of patients was evaluated by serum albumin assay and by the validated Arabic version of the Mini Nutritional Assessment (MNA).

An albumin of <35 g / l leads to protein-energy malnutrition, an albumin of <30 g / l leads to severe undernutrition.

The MNA score is frequently used tests for assessing nutritional status and identifying undernutrition in an elderly person. According to this test, anthropometric data (especially BMI) are one criterion among others. The evaluation takes place in two stages:

1. Screening based on 6 questions (A to F), graded from 0 to 2 or 0 to 3 and corresponding to a maximum

- a. If the score is greater than or equal to 12, there is no problem of malnutrition and it is useless to continue the test.
- b. If it is less than 12, there is a possibility of malnutrition and whether to continue the test

2. The overall assessment: Relies on 12 additional issues (L to R) scored 16 points in total. In the end, when a global assessment is made with the NAM, it is noted on 30 points:

- A MNA score less than 17 points corresponds to poor nutritional status
- MNA score between 17 and 23.5 at risk of malnutrition
- MNA score greater than or equal to 24 indicates a satisfactory nutritional status

collection and data analysis

Data were collected by detailed operating form completed by the same doctor and were collected into an Excel spreadsheet (Microsoft).

Informed consent was signed by the participating patients.

The anonymity of the subjects was totally preserved for the duration of the study.

Statistical analysis was assured by epi.Info6.0. software.

For the descriptive part, the means, standard deviations and percentages were calculated to summarize the distributions of the qualitative variables. The analytical study was based on the Pearson Chi 2 test with a significant $p < 0.05$.

Results

120 patients were included in the study, whose average age was 71 years (65-82), 66% were female. Mean BMI was 33.4 kg / m² (30-42), 22.5% of patients had a BMI greater than 35%. The mean duration of progression of diabetes was 9 years (1-14), HbA1c $\leq 8\%$ was present in 36.6% of our patients.

Tables I and II illustrate the demographics of our patients and the characteristics of diabetes

Dyslipidemia was observed in 51.6% (62) of patients and hypertension in 58.3%; 61% of patients had at least one degenerative complication.

Table III illustrates cardiovascular risk factors and micro-angiopathic complications in the study population.

Under nutrition was found in 10.8% (13) of patients and 28.3% (36) presented a risk of malnutrition. Figure 1 presented the distribution of patients according to the nutritional status assessed by the MNA score.

According to albuminemia, 32% of patients had protein-energy malnutrition, among them 8% were severely undernourished Figure 2

We found a significant correlation ($p < 0.05$) between undernutrition and low socio-economic status, polypharmacy, cholesterol-lowering and diabetic diet, the presence of nephropathy, and mastication or swallowing disorders.

Polypharmacy was present in 75.5% of malnourished patients versus 66% of patients with normal nutritional status.

With a significant difference ($p = 0.01$).

Nephropathy was present in 77.5% of malnourished patients versus 49.3% of patients with normal nutritional status

With a significant difference ($p = 0.001$).

Table IV represents the risk factors associated with undernutrition in obese elderly diabetic patients.

Table I: Clinico-demographic characteristics of patients

Clinico-demographic Characteristis	Number	Average	%
Number	120		
Middle age		71 ans (65-82)	
65-70 years	56		46,6%
71-75 years	44		36,7%
76-80 years	18		15%
Beyond 80 years	2		1,7%
Women	79		66%
Average BMI		33,4 Kg/m2	
30-34 kg / m2	85		70,8%
35-40 kg / m2	27		22,5%
Beyond 40 kg / m2	8		6,7%
Mid-province			
Rural	33		27,5%
Urban	87		72,5%
Socio-economic level			
Low	90		75%
Medium	25		21%
High	5		4%

Table II: Diabetes characteristics

Diabetes characteristis:	Number	Average	%
The average duration of evolution		9 years (1-21 years)	
<5 years	41		34%
5-10 years	44		36,6%
Beyond 10 years	35		29,4%
HbA1c			
≤ 8%	44		36,7%
8 <HbA1c≤ 10%	40		33,3%
HbA1c> 10%	36		30%
Treatment :			
oral antidiabetic drugs	34		28,3%
Insulin	63		52,5%
mixed treatment	14		11,6%
diet	9		7,6%

Table III: Cardiovascular Risk Factors and Microangiopathic Complications in the Study Population

Cardiovascular Risk Factors and Microangiopathic Complications	Number	%
Cardiovascular risk factors:		
Obesity	120	100%
HTA	70	58,3%
dyslipidemia	62	51,6%
Menopause	79	66%
Tobacco	18	15%
Ischemic cardiomyopathy	35	29%
Diabetic nephropathy:	73	61%
DiabeticRetinopahty:	45	37,5%
Autonomicneuropathy:	43	36%
Peripheralneuropathy:	57	47,5%

Table IV: Risk Factors Associated with Under nutrition (according to the MNA score)

Risk factor	Number of undernourished	Number of patients normonutris	P
Duration of evolution of DT beyond 5 years	28	51	0,9
Female sex	36	43	0,1
Age> 70 years	26	38	0,5
Nephropathy	38	35	0,001
Autonomic neuropathy	15	28	0,5
Peripheral neuropathy	18	39	0,05
The low level SE	42	48	0,01
Poly medication (≥3 drugs)	37	47	0,01
Poor oral condition	39	54	0,001
Hypo lipidic diet	39	34	0,001
Strict diabetic diet	37	8	0,01

Figure 1: Valuation of nutritional status according to the MNA score

Figure 2: Valuation of nutritional status according to the albuminemia

Discussion

In the absence of a consensus definition of undernutrition in the obese elderly, the prevalence of this association is difficult to assess, yet it increases clearly due to the increase in the prevalence of obesity, aging and chronic pathologies [5-7].

Positive diagnosis

The assessment of nutritional status is based primarily on clinical criteria such as weight measurement, body mass index, weight loss, anthropometric measurement, and dietary history items possibly combined in one score as the mini-nutritional assessment (MNA). Lean mass assessed by impedance measurement has a prognostic value. Hypoalbuminemia is a marker of poor prognosis [8,9]

The clinical and biological diagnostic tools used to define undernutrition in the general population are at fault in obesity [10] for several reasons:

1. First, BMI may be considered as normal, even after significant weight loss in a previously obese subject. The rapid

weight loss (even involuntarily) in chronic diseases be perceived relatively favorable, but it is a pejorative factor in malnutrition [11, 12]. Excessive fat mass may mask a significant loss of lean body mass in the older subject [13-14].

2. The albuminemia is the most appropriate parameter among the "classic" biological criteria for undernutrition. In the obese patient, many events, such as inflammation, hemodilution, liver failure, or urinary losses observed in complicated obesity, may also result in decreased albumin levels [15-17] more over, in patients with obesity without any obvious comorbidity, we find 20 to 25% hypo albuminemia (<35 g / L) without recognized etiologies [18, 19].

3. Therefore, in order to stop malnutrition in the obese person in current clinical practice, it is important to take into account different clinical arguments:

- The fast and significant weight loss ($\geq 10\%$ in 6 months or $\geq 5\%$ in 1 month)
- The clinical context: physical aggression (infection for example), immobilization
- The evaluation of the ingests to be compared with the energy expenditure of rest
- The decrease of physical capacities
- The extension of the nutritional equilibrium: Vitamins B, vitamins C, martial assessment, vitamino-calcium balance in addition to the usual biological factors such as albuminemia, pre-albuminemia and the CRP assay
- The global MNA.

In our study, the MNA score and plasma albumin dosage were used to assess nutritional status in the obese elderly diabetic patients.

Risk factors

chez le sujet âgé la dénutrition est d'origine plurifactorielle, impliquant les modifications métaboliques liées au vieillissement, la diminution de la prise alimentaire et les pathologies intercurrentes, en particulier inflammatoires. The origins and clinical situations leading to undernutrition and / or sarcopenia in obese subjects are the same as those of normal body size. Nevertheless, some clinical situations are more common in obese elderly [20] such as precariousness, depressive syndrome, dependency [21], chronic organ diseases, including cardiovascular diseases [22, 23], polymedication, some drug treatments such as corticosteroids or cancer chemotherapy [24, 25], restrictive diets, oral disorders [26] and a history of heavy digestive surgery or bariatric surgery [27, 28].

The degenerative complications of diabetes such as diabetic retinopathy by decreased autonomy, the anorexic pain of hyperalgal peripheral neuropathy and diabetic nephropathy can all worsen the situation. The origin of malnutrition in

nephropathic patients is multifactorial and complex, some factors are related to nephropathy itself (abnormalities of protein-energy metabolism, anorexia, dietary restriction, endocrine disorders) and others to hemo dialysis [29, 30].

Oral disorders favored by age, but also but diabetes too (three times more common among diabetics), low socioeconomic level and low educational level are known as risk factors favoring under nutrition for several years.

Finally, sedentary linked to weight gain and therefore particularly prevalent in obesity is also a risk factor for undernutrition, it is the cause of muscle weakness which in turn will cause a reduction in physical activity and a loss of strength and mass muscle and therefore.

Consequences

One of the major complications of undernutrition in the obese elderly is the decrease in muscle mass, which will be particularly hidden by the fat mass in this population and aggravated by the sedentary lifestyle. This sarcopenic obesity represents a negative prognostic factor in terms of morbi-mortality [31-32] and motor functional abilities, it participates in the alteration of immune defenses by decreasing reserves of amino acids, it promotes osteoporosis, motor disorders and of balance inducing falls with risk of fracture, it causes a decrease of the autonomy and an alteration of the quality of life [33].

This undernutrition also increases the risk of infection and the risk of dehydration, it prolongs the duration of hospitalization and delays healing. Finally, it participates in the degradation of cognitive abilities and psychological state.

Conclusion

Undernutrition in elderly and obese diabetic patients is a new clinical entity that remains unknown despite its significant prevalence.

The clinical and biological diagnostic tools used to define undernutrition in the general population are faulty in the case of obesity, which makes it difficult to take different clinical and biological arguments to evaluate the nutritional status of the study population.

specifically the psychosocial context (precariousness, depressive syndrome, addiction), chronic organ diseases favored by obesity and diabetes, certain drug treatments such as corticosteroids or anticancer chemotherapy, repeated restrictive diets and sedentary lifestyle increase the risk of undernutrition in the population studied.

The prevalence of undernutrition of the obese will increase in the following years given the aging of the population in parallel with the increase in the prevalence of obesity, it is therefore important to know how to diagnose and manage this undernutrition.

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