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Profile of malnourished COPD patients: A comparative study

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Abstract

Introduction: Malnutrition is frequently associated with chronic obstructive pulmonary disease (COPD) especially in severe stages. It is correlated with a poor prognosis.

The aim of this study was to determine malnutrition prevalence in COPD patients and to compare the profile of malnourished COPD versus not-malnourished COPD patients.

Patients and methods: Stable COPD patients benefited from nutritional evaluation by measuring body mass index (BMI). Subsequently, a comparative study was used to compare disease severity, number of acute exacerbations, modified Medical Research Council (mMRC) dyspnea scale score and exercise capacity by the 6 min walk test (6MWT) between malnourished and not malnourished COPD patients.

Results: 175 COPD patients were recruited (9F; 166M) aged between 40 and 86 with an average age of 67.95 years. The mean smoke load of the patients was 35(20) packs/year, FEV1: 52(21) % pred, mMRC dyspnea scale: 2 (1). 41.14% of COPD patients were malnourished (BMI < 20 Kg/m²).

Two groups were individualized.

- Group A: COPD with BMI < 20 Kg/m²: 72 patients, (4F; 68M), age: 67(9) years, FEV1: 48.5(21.44) % pred.
- Group B: COPD with BMI ≥ 20 Kg/m²: 103 patients, (5F, 98M), age: 68(9) years, FEV1: 55.25(21.42) % pred.

Using the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, the functional stages found in group A patients were GOLD I: 12%, GOLD II: 23%, GOLD III: 42%, GOLD IV: 23%. While for group B were GOLD I: 25% GOLD II: 35%, GOLD III: 28%, GOLD IV: 12%.

72% of group A patients have an mMRC ≥ 2 Vs 63% of group B.

77.8% of group A patients have a history of hospitalization for at least one acute exacerbation in the last 12-month vs 63.1% of Group B patients. The 6-min walk average distance (6MWD) was 423.58 m in Group A vs 438.33 m in Group B.

Conclusion: Nutritional assessment and appropriate management of undernutrition should be integrated into the treatment of COPD patients.

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Keywords: Chronic obstructive pulmonary disease; Body mass index; Malnutrition; Acute exacerbation; Exercise tolerance

1. Introduction

Malnutrition is an independent factor of mortality in COPD patients mainly in the most severe and consequently the focus is on the assessment and management of undernutrition in the context of COPD.

In this study we sought to determine malnutrition prevalence and the profile of malnourished COPD patients compared to not malnourished COPD patients.

2. Patients and methods

Outpatients with stable COPD were recruited in the pulmonary diseases department of the public hospital establishment of Batna. COPD patients underwent nutritional assessment by measuring BMI. Exacerbation history in the last 12 months and mMRC dyspnea scale were evaluated. Spirometric examination and 6MWT were also performed.

a comparative study was used to compare disease severity (FEV1), number of acute exacerbations in last 12 months, dyspnea severity and exercise capacity between malnourished (BMI < 20 kg/m²) and not malnourished (BMI ≥ 20 kg/m²) COPD patients.

3. Results

175 COPD patients (166 men and 9 women) aged 67(+/-9) years were recruited. The characteristics of COPD patients was reported in Table 1.

Table 1 Characteristics of COPD patients

Parameters	Results
Number	175
Age (years)	67(9)
Gender M: F	166:9
Smoking (p/year)	35(20)
FEV1 (% pred)	52(21)
m MRC dyspnea	2(1)
BMI (Kg/m ²)	21,32 (4,10)

3.1. Comparative study

Table 2 Comparison between two groups' characteristics

Parameters	Groupe A (COPD with BMI < 20 Kg/m ²)	Groupe B (COPD with BMI ≥ 20 Kg/m ²)
Number	72 (41,14%)	103 (59,86%)
Age (year)	67(9)	68(9)
Gender (M: F)	68:4	98:5
FEV1 (% pred)	48,5 (21,44)	55,25 (21,42)
BMI (Kg/m ²)	17,40 (1,64)	24,04 (2,89)
6MWT (m)	423,58	438,33

Malnutrition prevalence (BMI < 20kg/m²) was 41,14%.

Characteristics of two groups COPD patients were reported in Table2.

3.2. Comparison of functional status

65% of group A patients were classified (GOLDIII or GOLD IV) vs 40% of group B patients. Fig 1

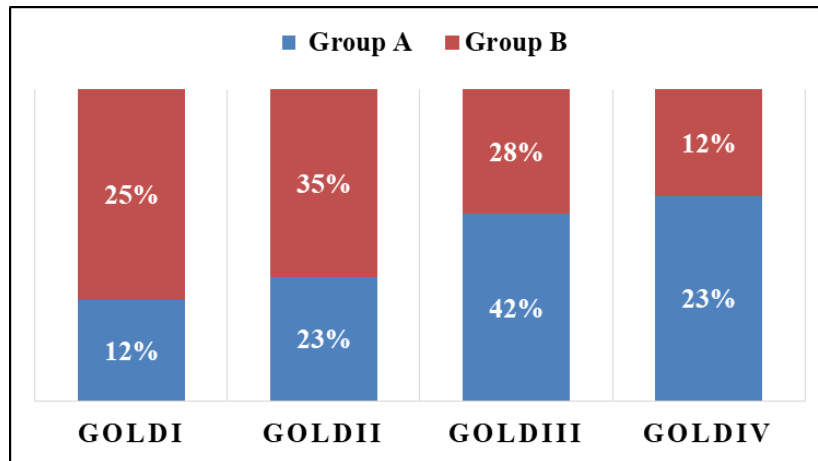


Figure 1 GOLD severity disease in group A vs group B patients

3.3. Comparison of dyspnea

72% of group A patients have an m MRC ≥ 2 Vs 63% of group B. Fig 2

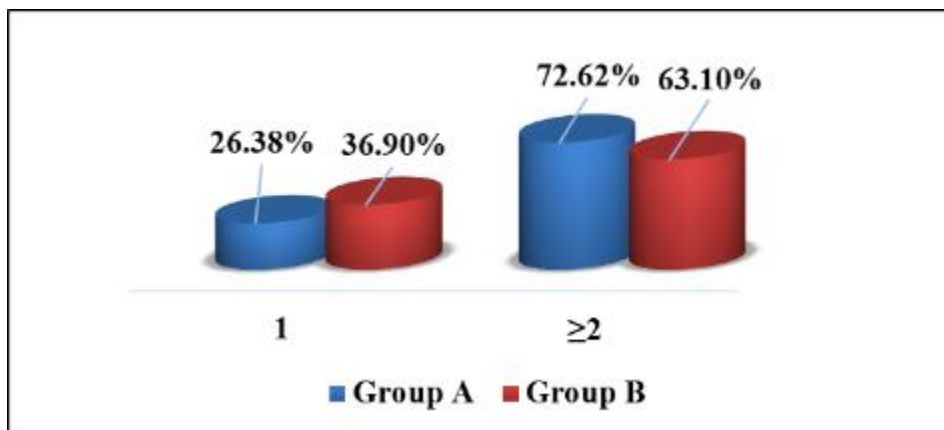


Figure 2 m MRC dyspnea severity in group A vs group B patients

3.4. Comparison of exacerbations' number

77.80% of group A patients had one hospitalization or more for acute exacerbation in last 12 months VS 63.10% of group B patients. Fig 3.

3.5. Comparison of exercise capacity

The average 6MWD was 432.58m in group A vs 438.33m in group B patients. Table 2

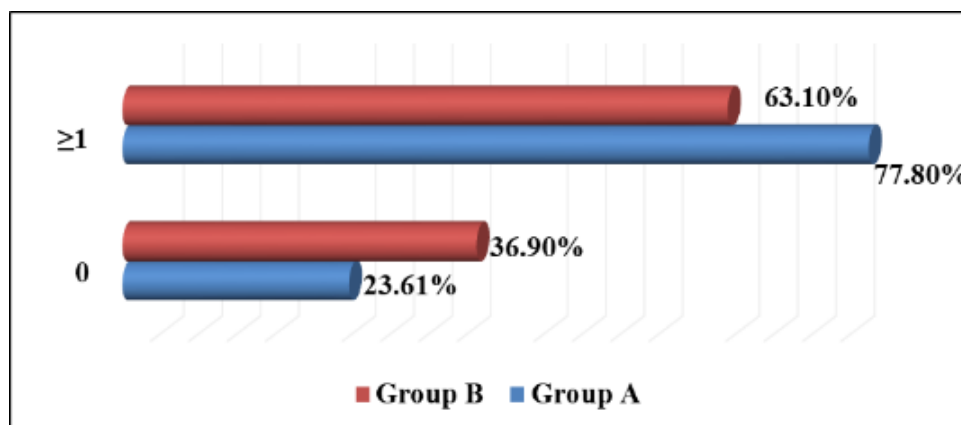


Figure 3 Hospitalizations number for acute exacerbation in last 12 months in group A vs group B patients

4. Discussion

Malnutrition is defined in COPD patients as a BMI < 20 kg /m² or weight loss > 10% over the last 6 months, or weight loss > 5% over the last month [1].

Malnutrition (assessed by BMI < 20 kg /m²) prevalence in COPD patients was 41.14% in the present study, while the undernutrition prevalence in COPD patients varies between 4 and 49% depending on the criteria used [2][3]. In addition, a BMI < 20 kg /m² was noted in 23% of chronic respiratory insufficiency patients treated with long term oxygen therapy or artificial ventilation at home [4]. In another study [5] the undernutrition prevalence ranged from 20 to 35% in patients seen in consultation and reached 70% in patients with acute respiratory failure or waiting for lung transplantation.

Compared to the group of not malnourished COPD, a predominance of severe COPD stages (65% GOLD III, IV) was noted in malnourished COPD group in the present study. In addition, Schols et al [6] have found a significant correlation (P<0.001) between undernutrition and bronchial obstruction severity during a study involving 412 COPD patients. The same results have been found in other works [1][7][8].

The results of this comparative study showed that dyspnea intensity was more major in malnourished COPD patients. It's however established that undernutrition leads to ventilatory mechanics and gas exchanges alteration in COPD which demonstrated the undernutrition impact on dyspnea intensity in COPD patients [9]. Other studies have shown that undernutrition in COPD also leads to a reduction in exercise tolerance, with an increase in fatigability secondary to muscle atrophy [10][4], these results corroborate those of the present study in which the mean distance covered during the 6-minute walk test was less in malnourished COPD compared to not malnourished COPD.

Exacerbations were common in malnourished COPD patients compared with not malnourished patients in the present study, on the other hand it was established that exacerbations and deaths were more common in undernourished COPD patients [11] [12]. Moreover, during hospitalisation for acute exacerbation, the risk of undernutrition is higher in COPD patients, given the increased metabolic demands associated with worsening mechanical impairment and/or infection [13][14]. It is even recognized that the risk of further exacerbations is higher in malnourished COPD patients [11].

5. Conclusion

The BMI is an independent factor of mortality in COPD mainly in the most severe, therefore interest is drawn to the need to monitor nutritional status as well as treat undernutrition in COPD patients, especially during acute exacerbations.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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