Enfermería Global
ISSN 1695-6141
Revista electrónica trimestral de Enfermería
N°53
Enero 2019
www.um.es/eglobal/

ORIGINALES

Nutritional status in people with chronic heart failure and / or chronic obstructive pulmonary disease. Impact on quality of life and on exacerbations

Estado nutricional en las personas con insuficiencia cardíaca crónica y/o enfermedad pulmonar obstructiva crónica. Impacto en la calidad de vida y en las exacerbaciones

Núria Fabrellas[1]
Gema Sáez Rubio[2]
Natividad Martín Peña[2]
Alicia Coiduras Charles[2]
Eva Mª Rodríguez Pérez[3]
Rosario Hernández Ibañez [2]

[1] Escola d'Infermeria, Facultat de Medicina i Ciències de la Salut. Barcelona. Spain.
[2] CAP La Marina. Institut Català de la Salut. Barcelona.Spain. gsrubio.bcn.ics@gencat.cat
[3] Institut Català de la Salut. Àmbit d'Atenció Primària Barcelona Ciutat. Spain.

http://dx.doi.org/10.6018/eglobal.18.1.304351

Received: 15/09/2017
Accepted: 27/01/2018

ABSTRACT:

Targets: To know the nutritional status in patients with heart failure (HF) and with chronic obstructive pulmonary disease (COPD), cared in a Barcelona's primary health center and to describe the clinical and socio-demographic characteristics which may be related with the nutritional status.
Method: A transversal descriptive study was performed during de year 2014. In nursing visits the following variables were collected: in HF patients, levels of functionality based in NYHA scale, in COPD patients, dyspnea grade based in BMRC scale. In both cases the body mass index (BMI) was determined; MNA scale is used, and also the physical activity and quality of life is evaluated by the EQ-5D scale.
Results: Of the 192 participants, 59, 4% were men and had a mean age of 77, 64 years (ds10, 12. Of the studied diseases, 40, 1% were HF, 45, 8% COPD and 14, 1% both diseases). The risk of malnutrition was 11, 4% in COPD patients, 16, and 9% in people with HF and 33, 3% in both HF and COPD patients. (P 0,028)
With the logistic regression with the other variables, the only associated factor was gender, having men an OR 3 (1,008-8, 95)
Conclusions: The nutritional status gets worse in people with both pathologies in concomitantly way. Gender plays a crucial role in malnutrition or risk of the disease.

Keywords: pulmonary disease; Chronic Obstructive; Heart Failure; Nutritional Status; Quality of life; Recurrence.

RESUMEN:
Objetivo: Conocer el estado nutricional de los pacientes con Insuficiencia Cardiaca (IC) y/o Enfermedad pulmonar obstructiva crónica (EPOC) atendidos en un centro de atención primaria de la Ciudad de Barcelona y describir las características clínicas y sociodemográficas que puedan tener relación con el estado nutricional.
Método: Estudio descriptivo transversal, durante los meses del 2014. En las visitas realizadas por enfermería, se recogieron las siguientes variables: en el caso de la IC grado de funcionalidad mediante la escala NYHA, en el caso de la EPOC, Grado de disnea mediante la escala BMRC. En ambos se determina el IMC, se administra la escala MNA, se valora el nivel de actividad física y la calidad de vida a través de la escala EQ-5D.
Resultado: De los 192 participantes, el 59,4% eran Hombres y la media de edad de 77,64 años(ds10,12). De las enfermedades estudiadas el 40,1% eran IC, el 45,8% EPOC y ambas enfermedades el 14,1%. El riesgo de malnutrición fue del 11,4% de las personas con EPOC, el 16,9% de las personas con IC y el 33,3% de las personas con ambas patologías.(P 0,028)
Al hacer la regresión logística con el resto de variables, el único factor asociado es el sexo, obteniendo los Hombres un OR 3 (1,008-8,95).
Conclusiones El estado nutricional empeora cuando se padecen las dos patologías de manera concomitante.En la malnutrición o en el riesgo de padecerla, el sexo juega un papel muy importante .

Palabras Clave: enfermedad pulmonar obstructiva crónica, insuficiencia cardiaca, Estado Nutricional, calidad de vida; Recurrencia

INTRODUCTION

In today's society, the increase in life expectancy leads to an aging population. This aging also with the worsening of healthy lifestyle justifies the increase of chronic diseases. Currently, the most important cause of mortality and disabilities are chronic diseases. (1) The most prevalent chronic diseases are cancer, diabetes, cardiovascular diseases such as heart failure (HF) and chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD). (1,3)

Heart failure in developed countries increases exponentially with age, being 1% before 50 years and 8% among people over 75 years[2] . The natural history of HF is marked by decompensating stages, which usually require hospitalization; a direct consequence of this is the financial overload for the National Health System[1]. The total cost of health care for HF in Spain, in 2013, was 1.8% -3.1% of the total public health budget(3).

In the case of Chronic Obstructive Pulmonary Disease, the prevalence has increased over the years, reaching 9% of the population. Nowadays, the distribution between genders is similar due to the increase in women with smoking habits[3]. The World Health Organization (WHO) estimates that by 2020, COPD will be the 3rd leading cause of death worldwide. This increase will place a considerable burden on the health system(3).

Multimorbidity is increasing and prevention in primary care is the key to the care of chronic diseases, as comorbidity adds complexity in the prevention and follow-up of patients with various chronic pathologies[3] The prevalence of multimorbidity varies from 13.1% to 90%; this wide range is due to the existence of different definitions, populations and data collection. The most common way to measure comorbidity is counting people with two or more chronic pathologies(1,3, 12).

Many people with COPD are in a state of considerable malnutrition; the use of nutritional supplements improves and maintains the pulmonary rehabilitation of these patients (5) In patients with HF the importance of nutrition lies in the low sodium diet

and constant weight control. We must not forget that strict sodium diets are anorexigenic, so a very low sodium diet could induce malnutrition [5]. Healthy eating is essential from the point of view of prevention and treatment of chronic diseases[3].

These two diseases (HF and COPD) frequently coexist and have common patterns; one of them is the frequent exacerbation, which increases the number of visits to emergency services, another common pattern is that it is the first cause of hospitalization in internal medicine services. The impact of these diseases derives from dependence, disability and the reduction of the quality of life of the affected person [3].

Because of that, we propose the following hypothesis. People with Heart Failure and/or Chronic Obstructive Pulmonary Disease have an inadequate nutritional status. The objective of this study is to know the nutritional status of patients with a diagnosis of HF and/or COPD visited in the La Marina primary care center in the city of Barcelona. In addition, to know the quality of life of these people, their level of physical activity and exacerbations due to decompensating.

METHODOLOGY

Descriptive cross-sectional study developed during 2014. The field of study was the population with a diagnosis of HF and/or COPD recorded in the computerized medical history and assigned to a primary care center in the city of Barcelona. People with severe mental disorders were excluded from the study, as were people with a terminal illness.

The variables analyzed were sociodemographic and clinical. In the case of sociodemographic variables, the data collection was made from the patient's medical history. The variables related to the socioeconomic level were elaborated by means of the elaboration of an "ad hoc" questionnaire that consists of 2 closed questions. The question to know the economic level had three response options: 1/ make ends meet, 2/ make ends meet with difficulty and 3/ does not make ends meet. The educational level was divided into four grades and the patient was asked; being the answer 1/ do not read or write, 2/ primary studies, 3/ high school or 4/ university studies.

In the case of clinical variables, the degree of severity of HF and COPD was evaluated through validated tests and questionnaires such as the New York Heart Association (NYHA) and the Medical Research Council (BMRC). The analysis of possible comorbidities such as liver disease, diabetes mellitus type 2, renal disease, dementia and neoplasms were searched in the patient's medical history.

Regarding the result variables, the nutritional status was evaluated through the Mini Nutritional Assessment (MNA), an instrument that consists of 18 elements that evaluates the anthropometric measures, the quality of the diet and family/ social resources.

The level of physical activity was evaluated through an adaptation of the physical exercise guide of the Catalan Health Institute (ICS). This modification resulted in 6 levels of physical activity: 1/ no physical activity, 2/ low: walk less than 2.5 hours/week, 3/ moderate: walk from 2.5 to 3.5 hours/week, 4/ adequate: walk more than 3.5

hours/week, 5/ high: walk more than 3.5 hours /week and perform another sport activity.
Through the health questionnaire, EuroQol EQ-5D evaluated the quality of life. This measuring instrument allows the patients to evaluate their health status in 5 dimensions (mobility, personal care, daily activities, pain/discomfort, and anxiety/depression) and, through an analog visual scale from 0 to 100, lets us know the self-perceived state of health in the day.

Finally, visits to emergency services or hospital readmission due to decompensations were taken from the patient's shared medical history and from information received from patients or relatives. The type of decompensation was also asked to the patient.

The statistical analysis was performed with the SPSS program vs16.0.

Clinical, sociodemographic, quality of life, physical activity level and number of decompensations and hospitalizations are expressed by average and standard deviation for quantitative variables and percentages for qualitative variables. In order to know the nutritional status, the percentage of patients with possible malnutrition was calculated with a 95% confidence interval. For the comparison of the variables described according to the nutritional status, the X2 test was used to compare proportions and Student T for the comparison of average. For variables that have not followed a normal distribution, nonparametric tests have been used (Anova test).

Ethical Aspects

The study met all the requirements stipulated by the Organic Law for the Protection of Personal Data (15/1999 of December 13, LOPD). The protocol was approved by the Clinical Research Ethics Committee of IDIAP, Jordi Gol, on 01/29/2014 nº: P14 / 002

RESULTS

The number of participants was 192 patients, 59.4% were men. The average age of the population was 77.64 years (ds: 10,12). 40.1% of the participants had HF, 45.8% COPD and 14.1% HF and COPD.

83.3% of the population studied were well nourished, 16.7% at risk of malnutrition and only 1% of the total were malnourished. This same calculation was made by pathology and the result was almost identical in patients with only one disease (88.6% COPD, 83.1% HF); On the other hand, the percentage of well nourished decreased significantly (66.7%) in the case of suffering both pathologies.

In reference to the risk of malnutrition, we found that 11.4% of the people with the diagnosis of COPD, 16.9% of the people with the diagnosis of HF and 33.3% of the people with both diagnoses HF_COPD were at risk of malnutrition. These differences are statistically significant **(p of 0.028)**.

The relation between nutritional status and gender is not statistically significant (p. 0.1), although the percentage of women at risk of malnutrition (11.5%) is lower than that of men (20.2%). The socioeconomic and educational profile does not make any statistically significant difference in relation to nutrition (table 1).

Table 1 Socioeconomic and Educational Level

	Well nourished	Risk and malnutrition	P
Socioeconomic Level			0.55
Make ends meet	50 %	59.4 %	
Make ends meet with difficulty	38.1 %	28.1 %	
Does not make ends meet	11.9 %	12.5 %	
Educational level			0.27
Do not read or write	16.9 %	12.5 %	
Primary studies	66.9 %	59.4 %	
High School	11.9 %	25 %	
University studies	4.4 %	3.1 %	

The functional capacity of patients with HF does not influence the risk of malnutrition; although it is observed that 15.9% of patients with a slight limitation are at risk of malnutrition versus 33.3% of patients with a marked limitation. Although it is true that there is no statistical significance (P 0.059), a tendency to the risk of malnutrition is detected in patients with a marked limitation (Table 2).

In the case of patients with COPD, the functional capacity (evaluated by the BMRC) and related to nutrition resulted in that 15.4% of the total patients were malnourished or at risk of malnutrition, versus 18, 4% of patients with moderate or severe dyspnea. This difference **is not statistically significant (p 0.67)** (table 2).

The grade of severity of patients with COPD is also not significant **(p 0.69)** in relation to the risk of malnutrition. 15.6% of patients with a mild grade of severity were malnourished or at risk of malnutrition, versus 13.7% of patients with a moderate grade of severity and 20.6% of severe or very severe patients (table 2).

Table 2 Functional capacity and nutritional status

	Well nourished	Risk and malnutrition	P
NYHA (HF)			0.059
Slight limitation	84.1%	15.9%	
Marked limitation	66.7%	33.3%	
BMRC (COPD)			0.67
Mild dyspnea	84.6%	15.4%	
Moderate or severe dyspnea	81.6%	18.4%	
Grade of severity (COPD)			0.69
Mild	84.4%	15.6%	
Moderate	86.3%	13.7%	
Severe	79.4%	20.6%	

The existence of comorbidities such as neoplasms, dementia, liver disease, diabetes, renal disease, hypertension did not modify the results of the nutritional evaluation; so there are no statistically significant differences.

Mobility according to the EuroQol test showed that patients with both pathologies were very deteriorated (70.4%); On the other hand, 49.8% of patients with a HF problem and 37.4% of people with COPD have only one mobility problem (Table 3).

The realization of daily activities is very difficult for those people with HF and COPD (59.2%). On the other hand, the percentage decreases when the person presents a single pathology (IC 48.1% and COPD 21.6%).

According to personal care, it is found that 48.1% of people with HF and COPD present a problem. 39% of people with HF and 17% of people with COPD report having no difficulty (Table 3).

The pain dimension presents a statistically significant difference. 25.9% of people who suffer from both diseases report no pain or discomfort. This percentage increases in people with HF (32.5%) or COPD (44.3%) without associated pathology (Table 3).

Table 3. Self-perceived quality of life according to dimensions and diseases

		HF	COPD	HF & COPD
Mobility	No problems	0.403	0.625	0.296
	Problems	0.597	0.375	0.704
Personal care	No problems	0.61	0.83	0.519
	Problems	0.39	0.17	0.481
Everyday activities	No problems	0.519	0.784	0.407
	Problems	0.481	0.216	0.593
Pain and Discomfort	No problems	0.325	0.443	0.259
	Problems	0.675	0.557	0.741
Anxiety and Depression	No problems	0.579	0.773	0.63
	Problems	0.421	0.227	0.37

The average value of the perceived quality of life of the entire study population is 66 (ds 21.2). When relating the quality of life with the studied diseases we found that patients with COPD are those with the best average of perceived health assessment 69.5 (ds 21.6) and the people with HF had the worst 58.3 (ds 19, 8). These differences are statistically significant (p 0.03)

In relation to physical activity we found that 32.8% of the people studied have a low level of physical activity (less than 30 minutes/day), 29.2% an adequate level and 27.6% moderate. Only 1.6% of them walk more than 3.5 hours a week (high level of activity) and 8.9% of the people studied do not perform any physical activity. When relating the quality of life with physical activity we found that the greater the intensity of physical activity, the better the perceived health, showing statistically significant differences **(p = 0.02)** (Table 4).

The ratio of visits due to decompensation was 0.12 to the center emergency service and 0.19 to the hospital. When we related them to nutritional status we observed that patients at risk of malnutrition or malnutrition have been visited one or more times due to decompensation per each visit of those well nourished (table 4).

Table 4 Visits to the Primary Care Center and the Hospital

	Primary Care Center visits (p 0.05)		**Hospital visits (p 0.00)**	
	Yes	**No**	**Yes**	**No**
Well nourished	46.9%	53.1%	6.9%	93.1%
Risk and malnutrition	65.6%	34.4%	28.1%	71.9%

The average of hospital admissions for decompensation were 0.32 not statistically significant (p 0.6) when related to nutrition; 31.3% of patients at risk of malnutrition or malnourished have been hospitalized compared to 16.9% of those with normal nutrition.

When doing the logistic regression in order to know which factors have been associated with the risk of malnutrition, we have found that the only factor that is associated in a statistically significant way was gender; men have an OR 3 (1,008-8,95) with respect to women (table 5).

Table 5. Risk of malnutrition or malnutrition related to:

Independent Variables	**P**	**OR**	**(HF 95%)**	
Gender	**0.048**	**3.004**	**1.008**	**8.95**
HF-COPD	**0.095**	**0.428**	**0.158**	**1.158**
NYHA	**0.127**	**0.41**	**0.13**	**1.288**
Physical Activity	**0.075**	**2.839**	**0.901**	**8.045**

DISCUSSION

As in the studies of Otero F and Álvarez J. the patients of this study are elderly, average age 77.6 years[13, 15], and mainly men 59.4% coincide with the study by Trullàs et al.[11]

Regarding malnutrition according to associated pathology, we observed that the risk of malnutrition or malnutrition occurs in 11.4% of people suffering from COPD, 16.9% of people with HF and 33.3% of people that suffer both diseases of study, in relation to other studies have not been concomitant the two diseases, but when analyzed separately in the article by Guerra-Sánchez et al. a positive relationship was found between the functional rank and the grade of malnutrition, so that the worse functional class, the higher degree of severe malnutrition [14]. This correlation does not occur in our study but there is a tendency to the rank of functional limitation with being at risk of malnutrition or malnutrition.

In the case of COPD, in our study, we observed a tendency to risk malnutrition or malnutrition in 11.4% of cases. The prevalence of malnutrition varies depending on whether the patient is hospitalized and the grade of severity of COPD [15].

In the case of Primary Care patients, according to a multicenter study conducted in 39 Primary Care patients in the Netherlands, the prevalence of malnutrition increases in clinically stable patients as well as in patients requiring pulmonary rehabilitation [16]). In the study by Pirlich M et al. it has been seen that older patients with a lower educational level and who live alone are more at risk of developing malnutrition [17]. Our study disagrees with these results, since 12.5% of patients at risk of malnutrition or malnourished can not read or write, and 66.9% of the well-nourished patients have primary education.

A European multicenter study evaluated the convenience of using the EQ-5D in patients with heart failure, showing that heart failure leads to the reduction of the 5 dimensions of health status (mobility, personal care, daily activities, pain/discomfort, anxiety/depression) [18]. This point of view coincides with our study, observing that in people with HF or both diseases they find problems in the dimensions of health status, as well as in the assessment of the quality of life and self-perceived health that presents an average of 58.3 (ds 21.7); lower figure compared to people with COPD that is 69.5 (ds 21.6).

Another study which assesses the quality of life with the SF36 test in patients with HF observes similarly to our results that the physical health components are those that are most deteriorated in these patients. [19]

According to De la Iglesia et al. both HF and COPD pathologies are the most frequent cause of admissions in the Internal Medicine services of the National Health System (NHS), constituting 26.4% of the total of hospitalizations [20]. In our study, 19.3% had been admitted in the last year due to decompensation of the disease. By associating these decompensation with nutrition we found that 28.1% of patients at risk of malnutrition or malnutrition have been visited by decompensation and 31.3% of patients at risk of malnutrition or malnourished has been admitted (hospital stay of more than 24h).

Limitations

The study was carried out in a primary care service in Barcelona with certain epidemiological and social determinants.

Because of the design of the study, we can not draw conclusions of causality, but we can formulate new hypotheses.

CONCLUSIONS

People with HF have a better quality of life than those who have developed COPD and also have a higher incidence of malnutrition or risk of suffering it.

Perform physical activity improve the perception of quality of life.

The nutritional status worsens when the two diseases are concomitantly affected.

In malnutrition or the risk of suffering it, gender plays a very important role, and according to the results in the group of women, the risk of suffering it is lower.
People with malnutrition have more decompensation of their chronic pathology, and visits to emergency services, either the same Primary Care Center or hospital emergencies, increase.

REFERENCES

1. Gènova R, Álvarez E, Catalá F, Fernández de Larrea N, Morant C. Aproximación a la carga de enfermedad de las personas mayores en España. Gaceta Sanitaria 2011;25(S):47–50
2. World health organization. preventing chronic disease: a vital investment. geneva, switzerland: world health organization. 2005. buscar mes actual i l'oms mathers cd. The global burden of disease: update. ginebra, organización mundial de la salud, 2008.
3. Morder A, Hoes Aw. Clinical epidemiology of heart failure. heart. 2007;93:1137-46
4. Sanchez L.A. Situación nutricional, insuficiencia cardiaca y conjunto mínimo básico de datos. Rev esp cardiol. 2012;65:583 - vol. 65 núm.06 DOI: 10.1016
5. Aggarwal A, Kumar A, Gregory MP, Blair C, Pauwaa S, Tatooles AJ, et al. Nutrition assessment in advanced heart failure patients evaluated for ventricular assit devices or cardiac transplantion. Nutr Clin Pract. 2013 Feb; 28(1):112-9. doi:10.1177/0884533612457948.
6. Barnes PJ. Chronic Obstructive Pulmonary disease: A growing but neglected global epidermic. PLoS Med.2007;4(5):112.doi:10.1371/journal.pmed.0040112
7. Sayago I, García F, Segovia J. Epidemiologia de la insuficiencia cardiaca en españa en los últimos 20 años. Rev esp cardiol. 2013;66(8):649–656
8 Boyd CM, Fortin M. Future of multimorbidity research: How should understanding of multimorbidity inform health system design? Public Health rev. 2010;32(2):451–74.DOI.ORG/10.1007/BF03391611
8. Roberts KC, Rao DP, Bennett TL, Loukine L, Jayaraman G. Prevalence and patterns of chronic disease multimorbidity and associated determinants in Canada. Health Promot Chronic Dis Prev Can. 2015 Aug; 35(6): 87–94.
9. Itoh M, Tsuji T, Nemoto K, Nakamura H, Aoshiba K.Undernutrition in patients with copd and its treatment. nutrients,5,1316-1335; doi: 10.3390/nu5041316
10. Trullàs JC, Formiga F, Montero M, Conde A, Casado J, Carrasco FJ,et al. Paradox of obesity in the heart failure: results from the spanish rica registry.medicina clínica 2011dic,157(15); doi:10.1016/j.medcli.2011.03.036
11. De la Iglesia F, Serrano J, Montes J. Enfermedad obstructiva crónica (EPOC) y comorbilidades. Galicia clin 2012;73(supl.1): s30-s36
12. Otero F, Grigorian l, Fransi l, Názara C, Fernández JM, Del Alamo A, et al. Estudio gallego de insuficiencia cardiaca en atención primaria.rev esp cardiol. 2007;60(4):373-83.
13. Guerra l, Martínez C, Fresno M. Cribado nutricional en pacientes con insuficiencia cardiaca: Análisis de 5 métodos. nutr hosp. 2015;31 (2): 890:899. doi:10.3305/nh.2015.31.2.7665.
14. Álvarez J. Enfoque terapéutico global de la disfunción muscular en la EPOC. nutr.hosp.2006; 21(supl.3)76-83
15. Vermeeren M, Creutzberg E, Schols a. prevalence of nutritional depletion in a large out- patient population of patients witch copd. respiratory medicine. 2006;100, 1349-1355.
16. Pirlich M, Schütz T, Kemps M, Luhman N, Minko N, Lübke HJ, et al. Social risk factors for hospital malnutrition. nutrition. 2005 mar,21(3):295-300.

17. Calvert M, Freemantle N, Cleland J. The impact of chronic heart failure on health-related quality of life data acquired in the baseline phase of the care-hf study. The european journal of heart failure. 2005:243-251
18. Naveiro JC, Diez MD, Flores L, et al. La calidad de vida en los enfermos con insuficiencia cardiaca: visión desde atención primaria de salud. gac sant. 2012;26(5):436-443
19. De la Iglesia F, Serrano J, Montes J. Enfermedad obstructiva crónica (EPOC) y comorbilidades. Galicia clín 2012;73(supl.1):s30-s36

ISSN 1695-6141