MORBIDITY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN COLOMBIA. RESULTS OF THE STUDY SANEPOC-2

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Resumen:

OBJECTIVE: to establish relationships between the morbidities of patients from the COPD program of a health institution in Anserma, Caldas (Colombia).
MATERIAL AND METHODS: a descriptive study was presented including a sample of 51 patients who underwent exploratory spirometry. The findings were contrasted with the main comorbidities reported by the patients or the Medical Record through descriptive and inferential statistics.
RESULTS: 50% of the evaluated population had at least one comorbidity in the records; the main morbidity found was Arterial Hypertension followed by Chronic Kidney Disease. An associated behavior was found between the GOLD classification and the presence of symptoms with non-statistically significant values. No statistically significant association was found between comorbidities and spirometric values.
CONCLUSIONS: new research that assesses clearly causality in Colombian population.
Key words: COPD; Morbidities; spirometry: Colombia; symptoms

Introduction

Following the GOLD guides (Global Initiative for Chronic Obstructive Lung Disease), Chronic obstructive pulmonary disease (COPD) is defined as a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases 1. Nowadays, it is considered a chronic non-communicable disease 2, with certain prevalence that makes it the fourth cause of death globally. 3

As the spread of the disease is continuously growing, different strategies to measure the the epidemiological behavior of COPD are being develop. Strategies like PLATINO4 and BOLD5 have attempted to unify the criteria for determining the prevalence while decreasing the interobserver variable6 in the diagnosis of COPD, obtaining estimated results of 8-10% globally.7

Studies like the ECLIPSE8 have posed questions about the natural behavior of the disease and have cast doubt on the role of VEF1/FVC as a measure for staging it. Nonetheless, the spirometry remains the GOLD standard for diagnosing COPD. 9

In Colombia, the PREPOCOL study10 established an approximate prevalence of 8,9% for the disease after carrying an transversal cut study which measured, by spirometry and by validated questionnaire, a sample of patients with risk factors for COPD in 5 different cities of the country (Bogota, Medellin, Cali, Bucaramanga and Barranquilla). In Medellin city, they found a prevalence of 13,5%. Due to the geographic location of the study, we use it as a sample of the region in the coffee belt; however, the article clearly states that the comparison of the disease's prevalence in different geographic regions is not recommended.

The ESE Hospital de San Vicente de Paul carried the first study on the importance of COPD in the program of chronic non-communicable diseases which was called SANEPOC-1. The main conclusion reported of that study was the misdiagnosis of COPD in an average of 2,07% of patients with diagnosis by spirometry. The conclusion of the study was the need of new, more complex studies that attempt to establish the prevalence and the characteristics of patients with COPD in the institution and in the region.

The objective of the SANEPOC-2 is to determine the morbidity associated to Chronic obstructive pulmonary disease, through an observational study of transversal cut in the department of chronic non-communicable diseases and the COPD program in a primary care hospital.

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Methods

This study wants to determine the morbidity associated to chronic obstructive pulmonary disease by checking the spirometric analysis of the patients that belong to the COPD program of the Anserma's council, Caldas, Colombia.

Study type: transversal cut study, descriptive and prospective.

Subjects: We took a sample of 572 patients with COPD diagnosis from the region of Anserma, Caldas, Colombia, belonging to the council's COPD program (trust level 85%, heterogeneity 50%).

Inclusion criteria: Patients older than 40 years old who belong to the COPD program and who accepted being in the research.

Exclusion criteria: Patients whose clinical records were incomplete, patients with a preexisting mental pathology, patients who cannot make the spirometric test: record of thoracoabdominal surgery in the last 3 months, record of acute coronary syndrome in the last 3 months, record of retinal detachment or ophthalmologic surgical procedure in the last 3 months, hospitalization due to heart causes in the last 3 months, active anti-tuberculosis therapy, pregnancy, heart rate higher than 160 beats per minute.

Criteria for the diagnosis of increase in the anteroposterior (AP) diameter: AP diameter equal or higher in length (in centimeters) than the transverse diameter of the rib cage associated to the data detected by the evaluator during the inspection (barrel chest).

Criteria for the diagnosis of cyanosis: bluish coloration in distal zones of the body (fingers, nose, ears, etc.) as seen by the evaluator and associated to pulse oximetry lower than 85%.

Bioethical component: this research includes an intervention with minimal risks, all patients gave informed consent and we had the relevant permission of the institution.

Data collection and analysis plan: data will be collected in a complementary way, partly through spirometric and clinical evaluation of the patients included in the research protocol. To add more information we included data taken from the patient's medical records included in the institution's data base, which is completed with the information provided by each of the selected patients. All the information was tabulated in the program Microsoft Excel 2013. For the data analysis, we used inferential and descriptive statistics, we used the program Stata version XII. The statistical significance was $p < 0,05$.

RESULTS

The COPD program's internal data show 572 patients (table 1), 10 of those (10,48%) are patients requiring oxygen, out of the 100% of patients belonging to the program, 64,3% is diagnosed with COPD without stratification; 20,1% is diagnosed with exacerbated COPD and 15,6% was diagnosed with COPD with acute infection in the lower airways. We called 81 (14,16%), 20 (24,69%) of which declined the invitation to participate on the study, from the remaining total (n=61) we excluded 16,39% after applying elimination and exclusion criteria. The details of the selection can be seen in Figure 1.

E.P.S	PATIENTS TOTAL		REQUIRING OXYGEN	
Caprecom	91	15,9%	16	26,7%
Cafesalud	279	48,77%	28	46.7%
Asmetsalud	157	27,44%	10	16.7%
Contributivo	572	7,89%	6	9.9%
TOTAL	**572**	**100%**	**60**	**100%**

Table 1. Sample of patients with COPD

50% of the evaluated patients presented morbidity (table 2). There was a predominance of cardiovascular-originated pathologies being hypertension and chronic kidney disease the most predominant pathologies. When we evaluated the coexistence of this two pathologies, we found that 95,4% of the patients with hypertension underwent some stage of Chronic Kidney Disease. 100% of patients who had diabetes comorbidity had hypertension and the 94,1% shared the morbidities hypertension and dyslipidemia.

Morbidity Characteristics	Sex distribution		Geographic distribution		Total percentaje
	Men	Women	Rural areas	Urban areas	
Burden of disease*	50%	50%	37%	63%	50%
Hypertension	54,2%	45,8%	62.5%	37,5%	47.1%
CKD	50%	50%	63.6%	36,4%	43,1%
Dyslipidemia	41,2%	58.8%	82.4%	17,6%	33,3%
Coronary disease	71.4%	28,6%	57,2%	42,8%	13,7%
Diabetes Mellitus	40%	60%	80%	20%	9,8%
Asthma	75%	25%	75%	25%	7,8%
Hypothyroidism	66,7%	33,3%	66,7%	33,3%	5,9%
Cerebrovascular disease	100%	0%	0%	100%	2%
Assistance to controls	56,4%	43,6%	69,3%	30,7%	76,5%
Total	60,8%	39,2%	62,7%	37,3%	50%**

Table 2. Burden of disease distribution by sex and location. *Burden of disease: at least one chronic associated pathology. **Corresponds to the global percentage of the burden of disease

Regarding the geographic distribution, in spite of the fact that most patients belonged to the council's region, we found a relationship rural areas:urban areas patients of 2:1 for pathologies like hypertension, chronic kidney disease, hypothyroidism and coronary disease. It is remarkable that the relationship increases to 4:1 regarding patients with dyslipidemia diagnosis. The adherence to medical controls on the analyzed population was 7:3. The morbidity details can be found in

When testing the presence of dyspnea during the intervention, we found that 90% of the patients who followed criteria for dyspnea were in a GOLD stage of 2-3 with a distribution 1:2(p=0.001). 100% of the patients who followed criteria for cyanosis were in the GOLD stage 4 (P=0,001) at the moment of the evaluation. Regarding the Increased front-to-back diameter of the chest during the intervention, we found that 80% of the patients were around the 2-3 GOLD stage with a distribution of 3:1; however, as the number of cases was limited, we did not consider the results conclusive(p=0,18). The behavior of the symptoms compared to the spirometry values are illustrated in Figure 2. We should highlight that alterations exacerbate in women.

DISCUSSION

By carrying this study, we attempted to approximate through spirometry a possible relation between the different morbidities of COPD patients' who belong to the health program of Anserma's council in Caldas, Colombia. According to the results, the alternate hypothesis raised by this team was not validated. This invalidation may be explained due to the transversal design of the study together with small sample that limits the structuring of links from a statistical point of view.

Regarding the morbidities found in the evaluated patients, we found results that were in line with Sievi and team[11], who through a transversal cut study reported as the most frequent comorbidity hypertension (50%). The coronary disease was also closely reported as well as the presence of dyslipidemia, concluding that the coexistence of 1 to 5 comorbidities can affect the development of the disease (p<0,001). Such results were postulated as potential predictors in the decrease of physical activity during the disease. Complementary, the mentioned decrease, that was tested with 6 minutes' walks, has been proven to be a clear predictor of mortality caused by lungs' problems (relative risk of mortality by all causes: 1,34 IC(1,26–1,42) P<0,001)[12]. Torres-Sanchez and team, in a systematic revision of literature, found multiple publications that related the presence of cognitive impairment and COPD in 3-30% of the cases, according to the studied publications. Nonetheless, due to the nature of the research, it is not possible to evaluate the causal relation in the reported findings[13]. Regarding a transversal cut study carried in *Bello Horizonte* by Pimienta-Pedrosa and team, the results showed potential relationships between the decrease in the score of Charlson's index and the presence of COPD in patients with a prior diagnosis of dementia syndromes[14].

The present research failed to establish clear relations between the reported morbidities and the found spirometric behaviors. The data was partially in line with the literature from all over the world. Black-Shinn and team evaluated the relation of hypertension with heart failure and COPD. They showed that heart failure was present in 15% of the cases, surpassing COPD after making adjustments due to confusing elements, categorizing both of them and independent from COPD. This event highlighted the need for new studies that focus on causality[15]. In a different study, Hersh and team[16] evaluated the presence of emphysema, using CT scan, and diabetes mellitus: they found potential associations that were statistically significant. Also, Torres-Sanchez and team[17], in a systematical literature review, found multiple publications that reported associations between endocrine metabolic diseases and COPD. Calverley and team in the TORCH study found a 27% death prevalence due to cardiovascular causes in patients with COPD[18]. New studies are needed that follow a methodology that allows us to create links and causalities between this disease and the most frequent comorbidities in the Colombian population.

After evaluating the presence of symptoms according to the GOLD classification and the spirometry of the patients, we found behaviors that suggest a relationship between the GOLD classification, the spirometry and the existence of symptoms. However, we must take into account the limiting factors such as the size of the sample, the little possibility of inference that the data provides and the applied exploratory method since the spirometric evaluation were exploratory: we did not made pre and post bronchodilator testing. As a result, new research that applies the spirometry test as it is demanded in the GOLD standard is needed. Also, new studies should include a better measure of symptoms, using valid and precise scales. All the mentioned elements could explain the differences with the ECLIPSE study results[19].

This study is limited, since it is an exploratory research, we cannot establish causal relationships between the studied variables. Prospective studies that deeply evaluate this objective are necessary. Although some results matched symptoms and spirometric figures, the size of the sample makes it impossible to establish clear associations. For this reason, we state that the results should be interpreted cautiously.

CONCLUSION

Although there are 50% of morbidities associated to chronic obstructive pulmonary disease in Anserma's council, Caldas, Colombia, the results of this research are not conclusive regarding the causal relationship between comorbidities and spirometric patterns. As a result, new research with methodical designs that target the causal relationships between comorbidities and spirometric figures is needed, as well as longitudinal studies in the Colombian population that validate the potential associations.

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