



Research Article

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Use of Triple Therapy in A Cohort of Patients with COPD Associated Wood Smoke and High Risk: Real Life Study of Five Cases

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Abstract

Introduction: Chronic obstructive pulmonary disease associated with exposure to wood smoke (COPD-L) is part of 30% of the etiology of this entity. We know that COPD-L has different characteristics compared to the association with tobacco. There is little worldwide experience in the use of bronchodilators and inhaled steroids in patients with this disease. Currently, the high risk of patients with COPD-L is the main cause of exacerbations and short-term cardiovascular outcome is the cause of increased morbidity and mortality. Triple therapy is currently a treatment used in patients with COPD-T with excellent clinical and symptomatic benefits.

Objective: To describe the effect of triple therapy in a series of 5 cases of patients with COPD associated with wood smoke (COPD-L) after 1-3-6 months of administration, improving symptoms and benefiting lung function.

Methods: Prospective, cross-sectional, observational real-life study carried out in the Department of Pulmonology of a third-level hospital in the City of Puebla in the period from January 1, 2024 to August 1, 2024 in patients with symptomatic L-COPD under the CAT scale despite dual bronchodilator therapy treatment.

Results: 100% of patients were female, exposed to wood smoke with an average of 196 hours/year; Eosinophil count of 338 cells on average, with CAT starting greater than 24 points before treatment and 13 points at the end of treatment at 6 months. Decrease to 50% of the eosinophil count, as well as Decrease in dyspnea 1 point on the MMRC scale and 5 points on the BORG scale.

Conclusion: The cases described offer initial evidence of our medical practice on the benefits of triple therapy in patients with COPD associated with firewood. Beclomethasone/Formoterol/Glycopyrronium have demonstrated good tolerance and safety without presenting adverse effects. These benefits have allowed the patient a better quality of life and a radical decrease in the prevalence of symptoms.

Keywords: COPD, Biomass, Triple therapy, High risk, Wood smoke

Introduction

The treatment of COPD has currently been based on the different international evidence-based guidelines, in this report we have based ourselves on the Spanish guidelines for their great use

worldwide and evidence-based (GesEPOC 2022). The COPD patient care process proposes an evaluation in 4 areas: Diagnosis and General Measures, Risk Stratification and selection of the inhaled



medication according to symptoms, clinical phenotype and finally approach to treatable traits. In high-risk patients, GesEPOC 2021 recognizes three phenotypes in the pharmacological treatment scheme: Non-exacerbating, eosinophilic exacerbator, and non-eosinophilic exacerbator. Under the above scheme and treatment algorithm, the eosinophilic and non-eosinophilic exacerbating patient benefits from the triple therapy to the increase in symptoms or exacerbation, as well as the increase in the number of eosinophils greater than 300 cells per deciliter in patients with high-risk COPD associated with tobacco. As has been stated, there are numerous writings regarding the association with tobacco but not with exposure to wood smoke. Patients with COPD associated with tobacco and firewood have similarities in some characteristics, especially in the diagnosis, but they also have different physical and clinical characteristics. Patients with high-risk COPD associated with tobacco benefit from triple therapy described in multiple studies for improvement in symptoms, reduction of exacerbations and reduction of mortality, which is why it is relevant to demonstrate in a descriptive way the benefit of triple therapy in the group of patients with high-risk COPD associated with wood smoke. The justification for carrying out the project is in order to have clear and real-life data both symptomatic and clinical of the use of the treatment in a group of patients with the same disease, but associated with another exhibitor and whose benefit has already been widely described in one of them. The importance of demonstrating the improvement in clinical and functional parameters in this group of patients is of utmost importance for its use in patients who present this clinical phenotype, especially in our Mexican and Latin American population. Perez Padilla, Villegas and Sansores et al are so far the only Latin American pulmonologists who have described the benefit of bronchodilators in patients with COPD associated with firewood with excellent results as well as the pathophysiology of the year, taking into account that the survival of patients associated with firewood and tobacco are similar as they have described, because it is beneficial to think that patients with triple therapy benefit from its use. Determining the clinical benefits of patients with high-risk COPD associated with wood smoke in a cohort of patients in a real-life study is of utmost importance in clinical and demonstrates the same benefit that is obtained in patients with high-risk COPD associated with tobacco. However, COPD in general, and exposure

studies using in vitro and in vivo model systems to understand the molecular mechanisms of COPD have been investigated primarily in relation to tobacco smoke. Studies on biomass-induced COPD, as well as biomass smoke exposure studies, are limited and the few available are mainly limited to Particulate Matter (PM2.5) wood smoke. Smoke from combustion processes is a complex mixture [1-6].

Material and Methods

Prospective, cross-sectional and real-life observational study carried out in the Department of Pneumology of a tertiary hospital in the City of Puebla in the period from January 1, 2024 to August 1, 2024. Inclusion Criteria; 1) patients diagnosed with COPD by GOLD/ATS/BTS/SEPAR criteria classified as high risk who attended the Pneumology outpatient clinic, 2) Patient with the use of LABA/LAMA dual bronchodilator therapy. 3) That they agreed to participate and signed a letter of informed consent. 4) Patients who have had an exacerbation in the previous year and persisted symptomatic by CAT score.

a) Exclusion Criteria: Patients with Asthma and Asthma-COPD Over position. Mainly patients who come to the outpatient clinic are described [7-9].

b) Development: Once the diagnosis of COPD was confirmed, the patient had post-bronchodilator spirometry, eosinophils in the blood. It was determined that as they went to the outpatient clinic during the next 1.3-6 months of starting the triple bronchodilator therapy due to previous exacerbation (at least a moderate exacerbation). CAT levels before and after treatment. The clinical dyspnea scales have been standardized in BORG, MMRC which are endorsed by different international organizations to determine the measurement of dyspnea.

Results

100% of female patients were exposed to wood smoke with an average of 196 hours/year, with an average of 196 hours/year, with an average of 338 cells, with CAT starting greater than 24 points before treatment and 13 points at the end of treatment at 6 months. Decrease in eosinophil count to 50%, as well as Decrease in dyspnea 1 point on MMRC scale and 5 points on BORG scale. (Tables 1 and 2) and (Figures 1 and 2).

Table 1: CLINICAL CHARACTERISTICS OF PATIENTS DIAGNOSED WITH COPD-L (exposure to firewood).

	PATIENT 1	PATIENT 2	PATIENT 3	PATIENT 4	PATIENT 5
GENDER	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE
AGE	56	65	67	78	81
SMOKING	-	-	-	-	-
EXPOSURE TO WOOD SMOKE (h/a)	160	200	260	160	200
EOSINOPHILES	310	390	370	290	330
INITIAL SPIROMETRY					
REL	55	58	44	50	63
FAWI	57	56	50	51	59
POSTBD	57	57	56	53	61
%	0	3	6	2	3
ML	0	80	110	60	75

CAT	24	29	30	30	24
SPIROMETRY AL					
MES 1					
REL	55	58	44	50	63
FAWI	57	56	50	51	59
POSTBD	58	58	58	54	62
%	1%	4%	8%	3%	4%
ML	31	90	130	75	82
CAT	21	22	24	24	22
SPIROMETRY AL					
MES 3					
REL	55	58	44	50	63
FAWI	56	57	50	51	59
POSTBD	58	60	60	53	60
%	2%	3%	10%	2%	1%
ML	35	75	170	55	28
CAT	16	20	16	20	16
SPIROMETRY AL					
MES 6					
REL	57	58	44	50	63
FAWI	60	57	50	51	61
POSTBD	61	59	58	53	63
%	1%	2%	8%	2%	2%
ML	29	75	120	58	64
CAT	13	16	13	16	11

Note*: REL: FEV1/FVC ratio. FEV1: Expired fraction in 1 second

PostBD: Post bronchodilator. ML: milliliters

CAT: COPD ASSESSMENT TEST (COPD Assessment Questionnaire, COPD Impact Test and Quality of Life).

Table 2: CLINICAL IMPROVEMENT OF PATIENTS WITH COPD-L WITH TRIPLE THERAPY (Glycopyrronium/Formoterol/Beclomethasone).

	PATIENT 1	PATIENT 2	PATIENT 3	PATIENT 4	PATIENT 5
Eosinophiles					
1 MONTHS	290	320	360	210	290
3 MONTHS	250	210	270	170	210
6 MONTHS	120	170	180	90	190
PREVIOUS CAT TT	24	29	30	30	24
CAT					
6 MONTHS	13	16	13	16	11
TT					
DYSPNEA					
PREVIOUS TT					
MMRC	2	2	2	2	2
BORG	7	6	7	6	5
DYSPNEA					
6 MONTHS					
TT					
MMRC	0	1	1	0	1
BORG	2	2	2	1	2

Note*: CAT: COPD ASSESSMENT TEST (COPD Assessment Questionnaire, COPD Impact Test and Quality of Life.

MMRC Scale: Medical Research Council Modified Dyspnea Scale)

Escala BORG (BORG Rating of Perceived Exertion)

TT: Trpple Terapia.



Figure 1: Improvement of the Cat with Triple Therapy After 6 Months of Treatment.

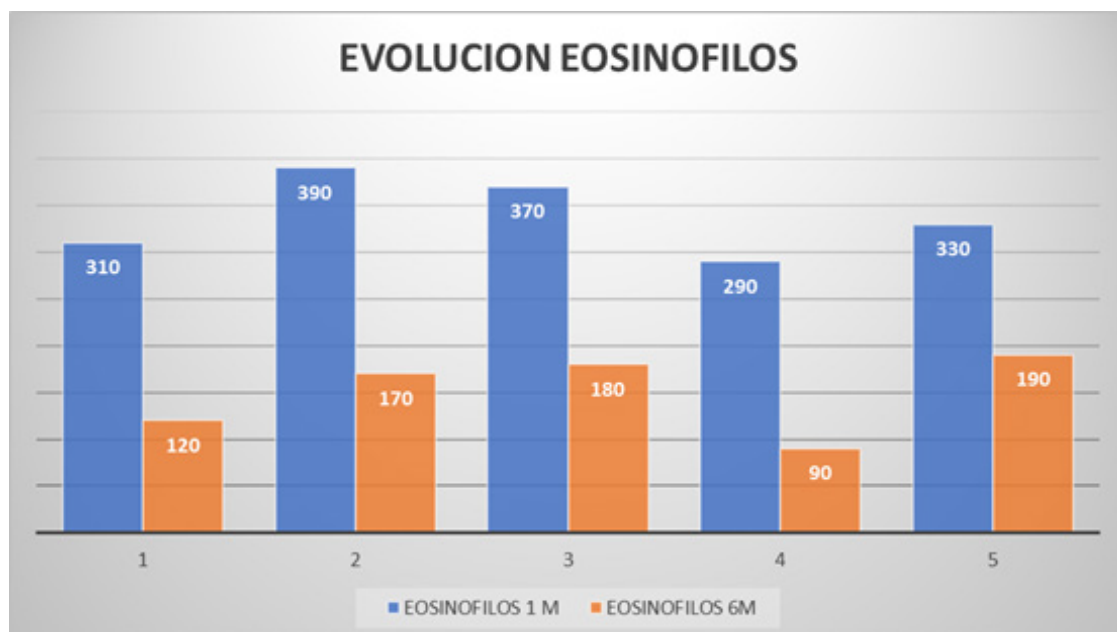


Figure 2: Evolution of Eosinophils.

Discussion

Patients with L-COPD associated with wood smoke so far are part of a percentage greater than 30% of those associated with tobacco, there is little evidence, but as commented by [3,4] *Dr Pérez Padilla, Ramírez and Sansores, et al.* have demonstrated the efficacy of double bronchodilation in patients with symptomatic COPD-L in previous studies, So far they are the most outstanding doctors

worldwide in the study of patients associated with firewood. This small, real-life study still reflects the presence of patients in Latin America who still cook with firewood and develop the disease over time. It is a small cut of patients in a short period of time, but enough to demonstrate short-term improvement very similar to those described in patients associated with tobacco in several studies with triple therapy [10,11].

Conclusion

This study of 5 real-life patients with L-COPD with high cardiovascular risk demonstrates the improvement of symptoms with the use of triple bronchodilator therapy (Glycopyrronium/Formoterol/Beclomethasone) with improvement of symptoms, decreased CAT, dyspnea and increase in lung function.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Camp PG, Ramirez Venegas A, Sansores RH, Alva LF, McDougall JE, et al., (2014) COPD phenotypes in biomass smoke- versus tobacco smoke-exposed Mexican women. *Eur Respir J* 43(3): 725-734.
2. Ramírez Venegas A, Torres Duque CA, Guzmán Bouilloud NE, González García M, Sansores RH, et al., (2019) SMALLa AIRWAY DISEASE IN COPD ASSOCIATED TO BIOMASS EXPOSURE. *Rev Invest Clin* 71(1): 70-78.
3. Ramírez Venegas A, Sansores RH, Pérez Padilla R, Regalado J, Velázquez A, et al., (2006) Survival of patients with chronic obstructive pulmonary disease due to biomass smoke and tobacco. *Am J Respir Crit Care Med* 173(4): 393-397.
4. Perez Padilla R, Ramirez Venegas A, Sansores Martinez R (2014) Clinical characteristics of patients with biomass smoke-associated COPD and chronic bronchitis. *Chronic Obstr Pulm Dis* 1(1): 23-32.
5. Ramírez Venegas A, Velázquez Uncal M, Aranda Chávez A, Guzmán Bouilloud NE, Mayar MayaME, et al., (2019) Bronchodilators for hyperinflation in COPD associated with biomass smoke: clinical trial. *International Journal of Chronic Obstructive Pulmonary Disease* 14: 1753-1762.
6. Miravittles, JJ Soler Cataluña, M Calle, J Molina, P Almagro, JA Quintano, et al., (2012) Spanish COPD guidelines (GesEPOC) Pharmacological treatment of stable COPD. *Arch Bronconeumol* 48(7): 247-257.
7. MCalle, B Alcázar, JB Soriano, JJ Soler Cataluña, JM Rodríguez, et al., (2017) Clinical audit of COPD in outpatient respiratory clinics in Spain: the EPOCONSUL study. *Int J Chron Obstruct Pulm Dis* 12: 417-426.
8. M Miravittles, M Calle, JJ Soler Cataluña (2021) One More Step Towards Personalized Treatment of COPD. *Arch Bronconeumol* 57(1): 9-10.
9. Solidoro Paolo, Albera Carlo, Ribolla Fulvia, Bellocchia Michela, Brussino Luisa, et al., (2022) Triple Therapy in COPD: Can We Welcome the Reduction in Cardiovascular Risk and Mortality? *Frontiers in Medicine*: 9.
10. Cazzola M, Rogliani P, Laitano R, Calzetta L, Matera MG, et al. (2022) Beyond Dual Bronchodilation – Triple Therapy, When and Why. *Int J Chron Obstruct Pulmon Dis* 17: 165-180.
11. Calzetta L, Matera MG, Rogliani P, Cazzola M (2020) The role of triple therapy in the management of COPD. *Expert Rev Clin Pharmacol* 13(8): 865-874.