Research Article

An Assessment of Demographics, Clinical Features, and Risk Factors in Patients With Chronic Respiratory Disorders in Two Latin American Countries

Albert Farrugia[1,2], Claudia Jiménez[3], Rafael Salazar[3], Eva Maroto[3], Andrea Gonzales[2], Rosario D'Imperio[2], Shane Fitch[2]

1. Medical School, University of Western Australia, Australia; 2. Lovexair Foundation, Spain; 3. Respiratory Physiotherapy, Lovexair Foundation, Spain

Chronic respiratory diseases such as asthma and COPD are prevalent in Latin America, yet diagnostic and management challenges persist. This study assessed the demographics, clinical characteristics, and risk factors of patients with respiratory disorders in Colombia and Mexico. A total of 103 patients were evaluated using spirometry, exhaled nitric oxide (FeNO), the COPD Assessment Test (CAT), and the Asthma Control Test (ACT). Only 22% of participants showed abnormal spirometry despite a reported prevalence of asthma and COPD of 39%. Conversely, FeNO abnormalities closely matched asthma prevalence. A significant association between BMI and dyspnea was also observed. These findings highlight diagnostic gaps and the need for enhanced screening methods in underdiagnosed populations. The results of this study may inform targeted interventions to improve respiratory health outcomes in these regions. A total of 103 patients with respiratory problems were assessed, using spirometry, the exhaled nitric oxide test (FeNO), the COPD Assessment Test (CAT) and the Asthma Control Test. Only 22% of the study population showed abnormal spirometry, despite a prevalence of asthma and COPD of 39%. Conversely, the FeNO test was abnormal to the same extent as asthma was prevalent. This population also showed an association between BMI and dyspnoea. The subjects showed a high level of awareness on the effect of environmental pollution on their respiratory problems. The experience and results of this exercise will be used to inform and guide clinical and social interventions aiming to improve the prospects and quality of life in patients with chronic respiratory disorders. They should assist in identifying and addressing diagnostic and treatment gaps in communities suffering from respiratory illness.

Corresponding author: Albert Farrugia, Albert.farrugia@uwa.edu.au

Introduction

Chronic respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD) represent a significant public health burden worldwide, particularly in low- and middle-income countries where underdiagnosis and suboptimal management are common. In Latin America, factors such as environmental pollution, socioeconomic disparities, and limited access to specialized care contribute to diagnostic and treatment challenges. Traditional diagnostic tools like spirometry are widely used, but their limitations in detecting early or atypical cases highlight the need for complementary approaches, such as exhaled nitric oxide (FeNO) testing.

This study aimed to assess the demographic characteristics, clinical features, and risk factors of patients with chronic respiratory conditions in two Latin American countries—Colombia and Mexico. Using data collected during community health events conducted in late 2023, we evaluated 103 patients using spirometry, FeNO, the COPD Assessment Test (CAT), and the Asthma Control Test (ACT). The goal was to identify patterns of disease burden, assess the utility of different diagnostic methods, and explore potential gaps in respiratory healthcare. These findings may provide insights into targeted strategies to improve diagnosis and management in underserved populations.

Methods

Patients with respiratory disorders were invited to participate in two workshops, one in Colombia, one in Mexico. Thirteen health care professionals trained in assessing respiratory illnesses through spirometry and other respiratory function tests described in the Results. During the workshops, these health care professionals conducted interviews with patients to collect information about their respiratory diseases, comorbidities, symptoms, risk factors (smoking, internal and external contamination, family history) exacerbations, triggers, treatment and adherence, pursuing an active life, and daily activities. Patient quality of life, the patients' overall state of health and their respiratory function were assessed and recorded. A total of 103 patients with respiratory problems were assessed. Ethical approval for this study was obtained from the ethics sub-committee of the Board of the Lovexair foundation (https://www.lovexair.com/en/consejo-asesor/) using the International Ethical Guidelines for Biomedical Research Involving Human Subjects (CIOMS 2016) and the Declaration of helsinki as guidance documents, and all participants provided informed consent. During the workshops, all patients received a

clinical report and educational materials about lung health as part of the workshop activities. After the workshops, patients were invited to attend webinars about their diseases.

Healthcare professionals held small meetings with patients to educate them on various aspects of their diseases, including inhaler use, breathing exercises, symptom management, and diaphragmatic breathing.

After the workshops, patients were invited to attend various webinars about their diseases.

Results

The patient demographic characteristics were similar between the two countries ($p > 0.05$) and are summarized as follows: Gender: 71% female, 29% male.

Age distribution:

- 5 – 17 12%
- 18 – 35 29%
- 36 – 64 32%
- >65 22%

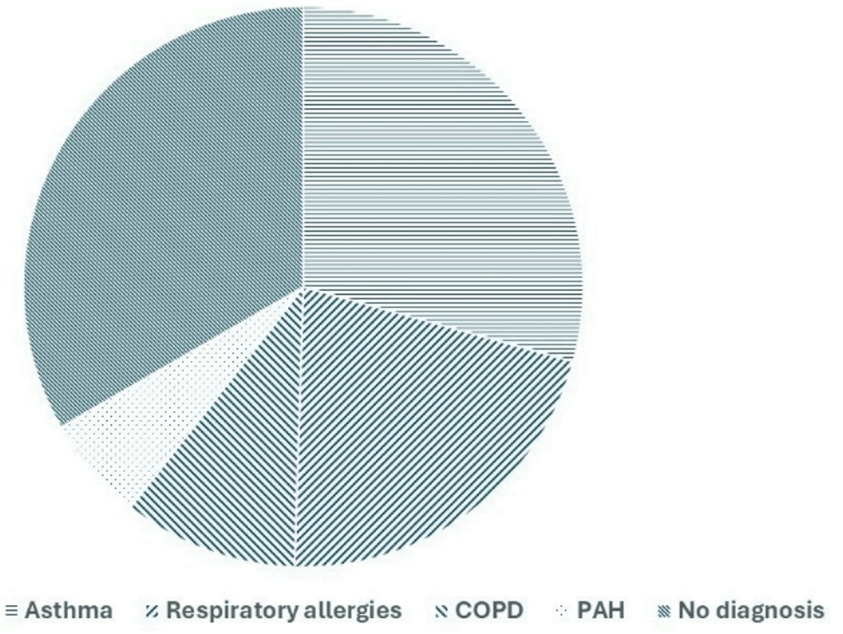

Figure 1. Previously diagnosed disorders in the study population

doi.org/10.32388/9OTTH5

The spectrum of previously diagnosed disorders is shown on **Fig 1**. Further assessment carried out over the course of the HappyAir events included spirometry[1], the exhaled nitric oxide test (FeNO)[2], the COPD Assessment Test (CAT)[3] and the Asthma Control Test (ACT)[4]. In addition, a subset of patients from Colombia were assessed for their respiratory health status relative to body mass index (BMI) and for the effect of their respiratory health status on their emotional health. In addition, the degree of dyspnoea was assessed using the MRC scale[5]. The results of these tests are shown in **Table 1**.

Patients	%
Abnormal spirometry	22
Abnormal FeNO	29
Undiagnosed patients who reported dyspnoea	69
High BMI indicating overweight and obese	55
High BMI reporting dyspnoea	62
Uncontrolled asthma (on basis of ACT)	14
Severe/very severe COPD (on basis of CAT)	50
Reporting high impact from environmental pollution	43
Considering impact of pollution significant	37
Ex/still/passive smokers	24
Respiratory illness affects their work	20
Severe emotional issues	44

Table 1. Test results in the study population

Discussion

These results align with previous findings on the limitations of spirometry in diagnosing chronic respiratory disorders such as COPD and asthma. While 39% of participants had a reported diagnosis of asthma or COPD, only 22% demonstrated abnormal spirometry[6][7], suggesting that alternative

diagnostic tools, such as FeNO testing, may be useful in certain cases. Our findings indicate that FeNO abnormalities were present in 29% of participants[8], matching the prevalence of asthma in the study population. While these findings support FeNO's potential role in asthma management, further research with larger and more diverse cohorts is needed to validate its clinical utility.

Notably, a high proportion of study participants expressed awareness of the impact of environmental pollution on respiratory health, consistent with prior studies in similar populations. These findings highlight the need for expanded diagnostic strategies and patient education programs in underserved communities. While this study provides preliminary insights, further investigation is necessary to assess how targeted interventions could improve early diagnosis and disease management.

This population also showed an association between BMI and dyspnoea, as has been shown in other patient groups[9]. Importantly, the study subjects showed a high level of awareness on the effect of environmental pollution on their respiratory problems, an aspect confirmed in other studies[10].

This study provides preliminary insights into the demographics, clinical features, and risk factors associated with chronic respiratory diseases in two Latin American countries. The findings highlight the limitations of spirometry as a standalone diagnostic tool and suggest that complementary assessments, such as FeNO testing, may improve detection rates for asthma in certain populations. Additionally, the association between BMI and dyspnea observed in this study supports the need for integrated management strategies that address both respiratory and metabolic health.

While these findings contribute to the understanding of respiratory disease burden in underserved communities, further research is necessary to validate these results in larger and more diverse populations. Future studies should explore the long-term clinical outcomes of patients diagnosed through different screening methods and assess the impact of targeted interventions on disease management and quality of life.

References

1. ^*Ponce MC, Sankari A, Sharma S. Pulmonary Function Tests. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Feb 6]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK482339/.*
2. ^*Harnan SE, Tappenden P, Essat M, Gomersall T, Minton J, Wong R, et al. Measurement of exhaled nitric oxide concentration in asthma: a systematic review and economic evaluation of NIOX MINO, NIOX VERO and*

NObreath. NIHR Journals Library; 2015.

3. ^*Lin JS, Webber EM, Thomas RG. Introduction to Screening for Chronic Obstructive Pulmonary Disease. In: Screening for Chronic Obstructive Pulmonary Disease: A Targeted Evidence Update for the US Preventive Services Task Force [Internet]. Agency for Healthcare Research and Quality (US); 2022 [cited 2024 Feb 6]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK580644/.*
4. ^*Przybyszowski M, Stachura T, Szafraniec K, Sladek K, Bochenek G. The influence of self-assessment of asthma control on the Asthma Control Test outcome. J Asthma Off J Assoc Care Asthma. 2021 Apr;58(4):537–46.*
5. ^*Fletcher CM, Elmes PC, Fairbairn AS, Wood CH. The significance of respiratory symptoms and the diagnosis of chronic bronchitis in a working population. Br Med J. 1959 Aug 29;2(5147):257–66.*
6. ^*Arne M, Lisspers K, Ställberg B, Boman G, Hedenström H, Janson C, et al. How often is diagnosis of COPD confirmed with spirometry? Respir Med. 2010 Apr 1;104(4):550–6.*
7. ^*Fortis S, Corazalla EO, Kim HJ. Does normal spirometry rule out an obstructive or restrictive ventilatory defect? Respir Investig. 2017 Jan 1;55(1):55–7.*
8. ^*Karrasch S, Linde K, Rücker G, Sommer H, Karsch-Völk M, Kleijnen J, et al. Accuracy of FENO for diagnosing asthma: a systematic review. Thorax. 2017 Feb;72(2):109–16.*
9. ^*Wang Z, Zhou X, Deng M, Yin Y, Li Y, Zhang Q, et al. Clinical impacts of sarcopenic obesity on chronic obstructive pulmonary disease: a cross-sectional study. BMC Pulm Med. 2023 Oct 18;23(1):394.*
10. ^*Yan P, Liu P, Lin R, Xiao K, Xie S, Wang K, et al. Effect of ambient air quality on exacerbation of COPD in patients and its potential mechanism. Int J Chron Obstruct Pulmon Dis. 2019;14:1517–26.*

Declarations

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.