Validated economic tool to measure the direct costs for patients with Idiopathic Pulmonary Arterial Hypertension (PAH) and chronic thromboembolic pulmonary hypertension (CTEPH) in Colombia

Poster Session 5
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Introduction

Pulmonary Hypertension (PH) is a rare (1% of the global population), progressive, and fatal disease characterized by increased pressure in the pulmonary circulation due to narrowing of the pulmonary arterial tree. This increase in pressure raises resistance to blood flow, making it more difficult for the heart to pump blood to the lungs for oxygenation (1). It is defined as a mean pulmonary arterial pressure (mPAP) greater than 20 mmHg at rest, measured during a right heart catheterization (RHC), and a pulmonary vascular resistance (PVR) >2 Wood Units (WU) (2). This study focused in:

-Group 1 – Idiopathic Pulmonary Arterial Hypertension (PAH)
-Group 4 - Chronic thromboembolic pulmonary hypertension and other arterial obstructions (CTEPH)

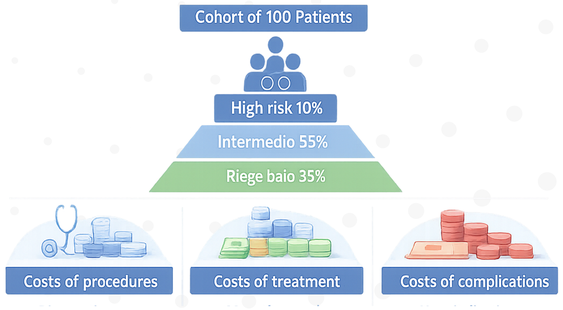
It is understood that pulmonary arterial hypertension can impose a significant financial burden on patients, their families, and healthcare systems. The estimation of the economic burden of a disease represents the economic weight that a disease places on the patient, caregiver, system, and society. This burden can be estimated through direct and indirect medical costs, family costs related to the care or support of the patient, and/or costs that healthcare systems must bear due to the complexity of the disease, care, treatment, or recovery of the patient. In terms of direct costs in Colombia, there is no validated estimation or tool that separates costs into categories such as complications, technology, and procedures. Therefore, a base scenario was created using public data from SISPRO databases and a literature review, followed by validation of the estimates with a group of experts.

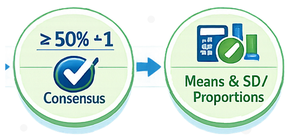
Objectives

To validate a tool that estimates the direct care costs of patients with idiopathic PAH and CTEPH in Colombia, classifying mortality risk and categorizing Healthcare Resource Utilization (HRU) in three areas: procedures, complications, and pharmacological treatments

Methods

The objective of the estimation is to provide a scenario based on the clinical practice regarding the costs associated with these patients and to calculate clinical budgets, technical notes, the budget impact of the disease, the cost of illness, and the cost of a typical patient with pulmonary hypertension (PH) in Group 1 and Group 4, using the following population distribution scheme and costs segmentation in terms of treatment patterns, Complications costs and Procedures costs





Surveys were conducted with five experts: four pulmonologists and one health economist. The responses were summarized in average values and percentages, considering consensus on a parameter if it reached 50% + 1

Results

Table 1. Distribution of Patients with PH by Risk Group Reported by Clinical Experts

Groups	Característica	n = 4[1]
PAH	Low Risk	28,8 (16,5)
	Intermediate Risk	56,3 (7,5)
	High Risk	15,0 (10,0)
CTEPH	Low Risk	45,8 (16,5)
	Intermediate Risk	37,0 (10,6)
	High Risk	17,3 (12,8)

[1]Mean (SD). One expert (1) excluded due to abstentio.

The pulmonologist experts had an average of 17.8 years (SD 5.3) of experience in the care of patients with pulmonary hypertension (PH). Additionally, they have treated an average of 269.3 (199.7) patients with PH during their professional practice. From August 2023 to August 2024, the average expert primarily cared for patients with PAH (70%) and, to a lesser extent, patients with chronic thromboembolic pulmonary hypertension (CTEPH) (30%).

Regarding the complications of patients with PH:

-Costing approach: All experts (5/5; 100%) agreed on including hospital complications both related and unrelated to right heart failure, using a macro-costing approach, with micro-costing applied exclusively to right heart failure; mean costs per complication event were validated by 80% of experts (4/5).

-Differences between PH and CTEPH: A majority of experts (3/5; 60%) indicated that the proportion of patients experiencing complications differs between PAH and CTEPH

-Frequency of complications: Sixty percent of experts (3/5) agreed with the proposed annual complication frequencies; right heart failure events were considered less frequent in low- and intermediate-risk patients but higher in high-risk patients, increasing from 1.1 to 1.3 events per year.

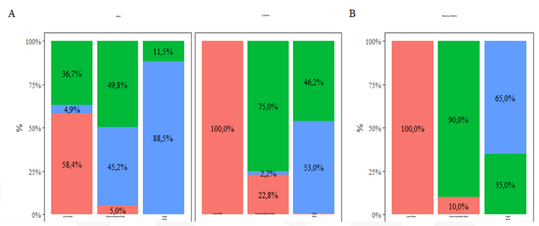
Regarding the treatment schemes (Figure 1), the experts determined different distributions in the treatment schemes by risk groups and type of pulmonary hypertension (PH) (Figure 1, Panel A), compared to the distribution to be validated (Figure 1, Panel B).

-In the monotherapy scheme, Phosphodiesterase 5 Inhibitors (39.5%) and Endothelin Receptor Antagonists (ERA) (33.6%) are the most used treatments.

-For dual therapy, the combination of ERA + PDE5i is predominant (86.7%). In the intermediate risk group, both monotherapy and dual therapy are common, with PDE5i (50%) as the main monotherapy and ERA + PDE5i (43.3%) as the most frequent dual therapy.

-In the high-risk group, triple therapy is the primary management strategy (88.5%), with the combination of ERA + PDE5i + Treprostinil being the most utilized (45.9%).

Figure 1. Distribution of treatment schemes according to experts for PAH and CTEPH (A). Proposed or validation treatment scheme (B).



Expert validation indicated that outpatient service use should be assessed separately for PAH and CTEPH, with the greatest discrepancies observed in specialist visits and emergency care, particularly in high-risk patients where specialist follow-up appears underestimated. Overall agreement was high for diagnostic tests, with minor adjustments in 6-minute walk test and NT-proBNP/BNP, while imaging and surgical procedures were generally less frequent than initially assumed, except for balloon pulmonary angioplasty in CTEPH.

Conclusions

The experts' evaluation of the methodological approach of the PH cost tool is satisfactory, particularly in stratifying these patients by risk groups. However, experts continue to emphasize that the use of technologies differs between patients with PAH and CTEPH. In terms of service usage frequencies, this difference is not as pronounced between the reference values of the tool and the values reported by the experts. However, it is identified that the pharmacological therapeutic approach differs both from the reference values and between PAH and CTEPH. Accordingly, it is recommended to model the groups of PH separately. Additionally, it is suggested to consider changes in the use of health services and technologies based on the therapeutic response of patients with PH

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