A Patient Journey Map for People Living with Autoimmune Pulmonary Alveolar Proteinosis (aPAP)

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OBJECTIVE

To describe the experiences and needs of people in the United States living with aPAP

CONCLUSIONS and CLINICAL IMPLICATIONS

This patient journey map (PJM) provides insights on the distinct phases of people's journeys with aPAP. Patients living with aPAP reported inconsistent, heterogeneous, burdensome, and circuitous journeys. These journeys often included multiple misdiagnoses, long periods without a correct diagnosis, and substantial treatment, financial, and emotional burdens.

People with aPAP also provided feedback on what could improve the experiences of those living with the disease, such as improved diagnostics and treatments, and greater education on the disease within the medical community.

This PJM provides the medical community with valuable information on the needs of people living with aPAP and increases the awareness and knowledge of this rare lung disease. Over time, these factors may improve diagnosis, treatment, and the overall holistic experience of people living with aPAP.

DISCLOSURES

Savara Inc. participated in the study design, study research, collection, analysis, and interpretation of data, as well as the writing, review, and approval of this poster for submission. All authors had access to the data, participated in the development, review, and approval of this poster, and agreed to submit this poster to the CHEST 2024 Annual Meeting. The presenting author has been given the right by all co-authors to present on their behalf. The patient author and patient participants have consented for this work to be presented and were reimbursed for their time and contributions to this study. Savara Inc. funded this research and provided writing support for this poster. Medical writing assistance, funded by Savara Inc., was provided by Mark Elms PhD of Oxford PharmaGenesis.

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Purpose

- Autoimmune pulmonary alveolar proteinosis (aPAP) is a rare lung disease mediated by granulocyte-macrophage colony-stimulating factor (GM-CSF) autoantibodies that block physiological GM-CSF signaling. This leads to reduced surfactant clearance in the lungs, causing abnormal accumulation of alveolar surfactant and impaired gas exchange.[1]
- People living with aPAP often face a complicated journey – physically, emotionally, and financially – to receive the correct diagnosis and treatment.[2]
- We have developed a patient journey map (PJM)[3] to describe the experiences and needs of people in the United States (US) living with aPAP throughout their journey with the disease.

Methods

- This PJM, which was created based on insights and feedback from people living with aPAP, was developed in four stages.
  1. Analysis of the existing literature.
  2. Two patient advisory board (PAB) meetings and two 1:1 patient interviews (n=7).
  3. An online survey of patients (n=19).
  4. A validation workshop with patients (n=6) to confirm that insights and experiences had been accurately represented in the PJM.

Results

Patient demographics

- The demographics of patients are shown in **Table 1**.

Table 1. Baseline demographics	PAB meeting and 1:1 interview patients (n=7)	Survey patients (n=19)	Workshop patients (n=6)
Sex at birth, n (%)			
Male	3 (42.9)	9 (47.4)	3 (50.0)
Female	4 (57.1)	10 (52.6)	3 (50.0)
Ethnicity, n (%)			
Caucasian or White American	5 (71.4)	17 (89.5)	5 (83.3)
Latin or Hispanic American	1 (14.3)	2 (10.5)	1 (16.7)
Asian or Asian American	1 (14.3)	0	0
Current age, years, n (%)			
18–30	1 (14.3)	2 (10.5)	0
31–45	3 (42.9)	5 (26.3)	2 (33.3)
46–64	3 (42.9)	11 (57.9)	4 (66.7)
65 and over	0	1 (5.3)	0
Age at diagnosis, years, n (%)			
13–17	0	1 (5.3)	0
18–30	3 (42.9)	4 (21.1)	2 (33.3)
31–45	2 (28.6)	8 (42.1)	3 (50.0)
46–64	2 (28.6)	6 (31.6)	1 (16.7)
Employment, n (%)			
Full-time employed	2 (28.6)	6 (31.6)	2 (33.3)
Self-employed	0	3 (15.8)	0
Part-time employed	2 (28.6)	2 (10.5)	1 (16.7)
Retired	1 (14.3)	2 (10.5)	0
Unable to work	0	2 (10.5)	1 (16.7)
Unemployed	1 (14.3)	2 (10.5)	1 (16.7)
Semi-retired	1 (14.3)	1 (5.3)	1 (16.7)
Other	0	1 (5.3)	0
Health insurance coverage, n (%)			
Private	5 (71.4)	12 (63.2)	4 (66.7)
Public	1 (14.3)	6 (31.6)	2 (33.3)
Private and public	0	1 (5.3)	0
Unknown	1 (14.3)	0	0
Region of the US by census divisions, n (%)			
Midwest	0	2 (10.5)	2 (33.3)
Northeast	1 (14.3)	4 (21.1)	1 (16.7)
South	2 (28.6)	6 (31.6)	2 (33.3)
West	4 (57.1)	7 (36.8)	1 (16.7)

Abbreviations: PAB, patient advisory board; US, United States.

Results

Patient journey map

- Four distinct phases of the patient journey were identified: 1) symptoms and experience before diagnosis; 2) diagnosis with aPAP; 3) treatment; and 4) ongoing monitoring (**Figure 1**).

Survey – Symptoms and experience before diagnosis

- The most commonly reported initial symptoms were breathlessness (89.5%), fatigue (84.2%), and dry cough (73.7%).
- The majority of patients (73.7%) reported receiving at least 1 misdiagnosis, most commonly pneumonia (42.1%).
- Of the patients who reported having a misdiagnosis (n=14), 92.9% reported receiving treatment for a misdiagnosis.
  - Of those who received treatment for a misdiagnosis (n=13), the most common treatments were antibiotics (76.9%) and steroids (69.2%).

Survey – Diagnosis with aPAP

- Patients reported heterogeneous diagnostic pathways comprising numerous diagnostic tests, and often waited several months or years after initial presentation to a healthcare professional (HCP) before receiving the correct diagnosis of aPAP.
  - The most commonly reported diagnostic test that led to an aPAP diagnosis was a lung biopsy (52.6%). Only 21.1% of patients reported receiving the pathognomonic GM-CSF autoantibody test. This low percentage is likely due to poor knowledge and low availability of the test until recently.[4,5]
  - The majority of patients (52.6%) visited 2 or more HCPs before being referred to a pulmonologist, and most (57.9%) reported visiting 2 or more pulmonologists before receiving an aPAP diagnosis.
  - Patients reported waiting long periods of time to receive a correct diagnosis, ranging from a minimum of 1 month to over 2 years. The majority of patients (89.5%) received a correct diagnosis between 1 and 18 months after first visiting an HCP.

Survey – Treatment

- Treatment pathways varied substantially, and currently available aPAP treatments (specifically lung lavages) and off-label therapies were frequently described as burdensome, emotionally taxing, and/or financially worrisome.
  - The most commonly reported treatments for aPAP by patients (n=18*) were lung lavages (94.4%), followed by off-label inhaled GM-CSF (66.7%), and oxygen therapy (61.1%).
  - It is likely that the lack of standardized guidelines for aPAP diagnosis and treatment until very recently has led to the reported heterogeneity and inconsistency in diagnostic and treatment pathways experienced by patients.[6–9]

Survey – Ongoing monitoring

- Patients reported that long-term concerns of living with aPAP centered around ongoing symptomatology, financial worries, and emotional challenges.
- Patients also reported inconsistent long-term care, with a lack of standardized protocols in place for regular check-up appointments.
  - The patients (n=18*) reported 6 different appointment schedules for long-term care for their aPAP, with the most common frequency of check-up appointments (50.0%) being every 6 months.

*1 patient did not answer the respective survey questions.

Additional patient insights

- Throughout their journeys, patients described an "emotional rollercoaster", especially during the pre-diagnosis and treatment stages.
- Patients also reported common barriers to care, particularly problems with insurance and access to expert care.
  - Patients specifically cited the need for increased help with insurance challenges (most notably, coverage related to off-label inhaled GM-CSF) and the need for improved education on aPAP within the medical community.

Validation workshop

- The workshop patients (n=6) generally agreed with the content of the PJM, and no patients disagreed.
- The level of agreement reported by the workshop patients for each phase of the PJM is shown in **Table 2**.

Table 2. PJM validation	"Agree" or "Mostly agree"	"Neither agree nor disagree"	"Mostly disagree" or "Disagree"
Phase 1. Symptoms and experience before diagnosis, n (%)	5 (83.3)	1 (16.7)	0
Phase 2. Diagnosis with aPAP, n (%)	4 (66.7)	2 (33.3)	0
Phase 3. Treatment, n (%)	6 (100)	0	0
Phase 4. Ongoing monitoring, n (%)	6 (100)	0	0

Abbreviations: aPAP, autoimmune pulmonary alveolar proteinosis; PJM, patient journey map.

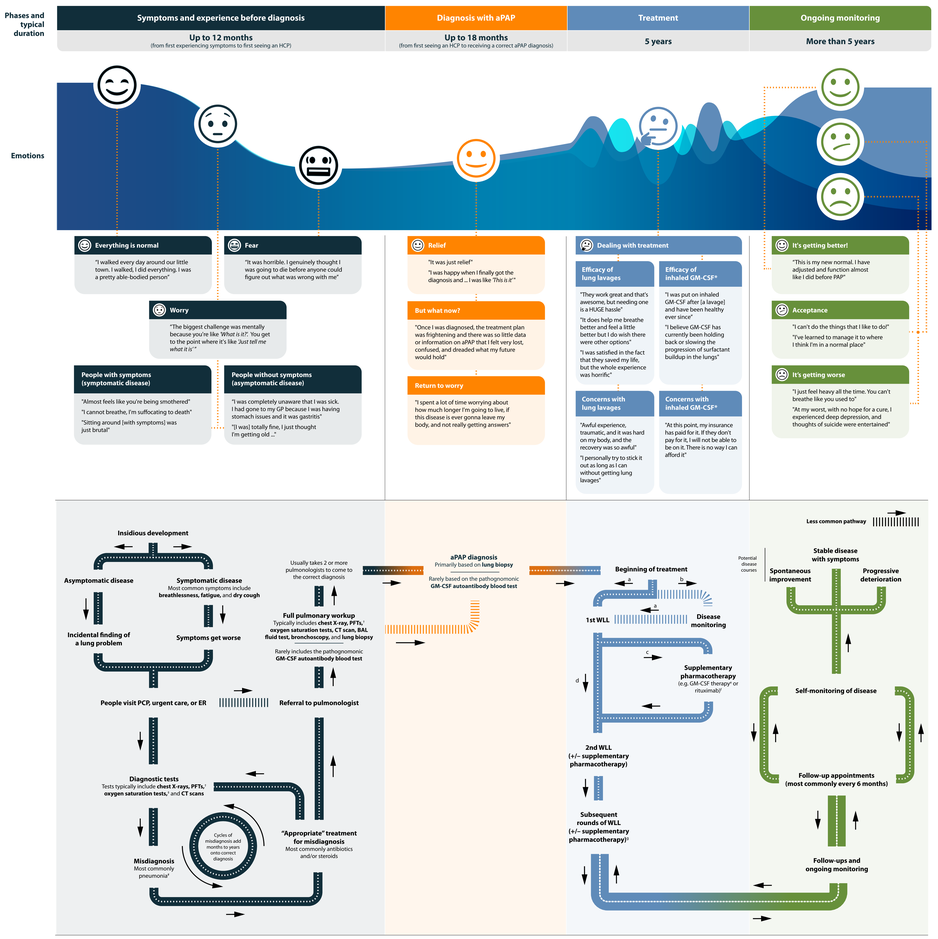

Figure 1. Patient journey map. *Inhaled GM-CSF refers to off-label, compounded GM-CSF. †PFTs typically include spirometry, 6-minute walk test, arterial blood gas analysis, and lung diffusion capacity analysis. ‡Due to observed low oxygen saturation levels during diagnosis, people often start on oxygen therapy at this point. For many, this continues throughout the remainder of their journey on a continuous, intermittent, or ad hoc basis dependent on disease severity. §Other common misdiagnoses include asthma and bronchitis. ¶If symptoms are affecting QoL or daily activities. ‖If asymptomatic or symptoms are not affecting QoL or daily activities. #Patients with relief of symptoms and most surfactant removed may be prescribed supplementary pharmacotherapy to lengthen time between WLLs. **Patients with no immediate improvement in surfactant buildup or symptoms may be expedited to subsequent WLLs. ††Off-label, compounded GM-CSF (sargramostim, or molgramostim as part of a clinical trial). ‡‡Use of GM-CSF treatment is limited due to lack of FDA approval and lack of dosing and administration guidelines. In rare cases, rituximab may be used in situations when access to GM-CSF treatment is limited, or patients are refractory to treatment. Other rare treatments for aPAP include plasmapheresis, statins, and pioglitazone. §§In those with serious complications, such as pulmonary fibrosis, lung transplantation and/or ECMO may be needed. Abbreviations: aPAP, autoimmune pulmonary alveolar proteinosis; BAL, bronchoalveolar lavage; CT, computed tomography; ECMO, extracorporeal membrane oxygenation; ER, emergency room; FDA, US Food and Drug Administration; GM-CSF, granulocyte-macrophage colony-stimulating factor; GP, general practitioner; HCP, healthcare professional; PAP, pulmonary alveolar proteinosis; PCP, primary care physician; PFT, pulmonary function test; QoL, quality of life; US, United States; WLL, whole lung lavage. Grammar and spelling errors in direct patient quotes have been amended to ensure readability.