Title: Evaluating Spirometry Challenges and the Need for Simplified Lung Function Test: A Multi-Centric Indian Study

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Background:
Spirometry is crucial for diagnosing various lung diseases and is considered the gold standard for lung function measurement. However, it remains a challenging test for many patients, requiring significant effort and cooperation.

Objective & Methods:
In this cross-sectional, observational, point prevalence study, we evaluated the challenges faced by spirometry technicians and pulmonologists referring patients for spirometry, particularly those undergoing the test for the first time. The study was conducted across 10 centers (pulmonologist clinics) in India, located in Uttar Pradesh, South Delhi, Telangana, Tamil Nadu, Kerala, Karnataka, Madhya Pradesh, West Bengal (2 centers), and Rajasthan.

Results:
The study included 12 experienced technicians (average experience of 6.9 years) and 316 patients [Mean age: 44.39 ± 17.23, range18-96 years; M: F = 57.9%: 42.1%]. One patient refused to perform spirometry. Of the 315 who underwent spirometry, all completed 3 blows, except one who was unable to perform due to old age. The average spirometry trials performed were 4 and the average time taken was 23 minutes (range: 6-60 mins) The primary reasons for spirometry testing were obstructive airway disease (50%), breathlessness (23%), and cough (18%). According to the pulmonologists, use of spirometry influenced management in 27.85% and diagnosis in 25.32% of patients. The spirometry technicians reported that 29% of patients found it challenging to perform the test (74.7% due to breathing difficulties, 9.9% due to inability to follow instructions, and 15.38% due to other reasons). Furthermore, 34.9% of patients themselves reported challenges with the test, primarily breathing issues (58.2%), instructional difficulties (22.7%), and mouthpiece–related problems (12.73%). Approximately 34.81% of patients indicated a preference for a simpler alternative lung test to spirometry.

Conclusion:
Despite the involvement of well-trained technicians, a significant proportion of patients (around one-third) found spirometry difficult to perform. This highlights the ongoing need for simpler, more accessible alternatives to traditional spirometry for lung function assessment.

Discussion: Despite being the gold standard for lung function testing, spirometry poses challenges for many patients, emphasizing the need for improved patient preparation and simpler, more accessible alternatives for better compliance and outcomes.

Keywords: Spirometry, lung function test, patient challenges, technician experience, alternative lung test, obstructive airway disease, diagnostic tool, pulmonary function.