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Sufficient inspiratory effort for a dry powder inhaler - do we have to measure it, or can we observe it? – Post hoc analysis of the PIFotal study.

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Sufficient inspiratory effort for a dry powder inhaler - do we have to measure it, or can we observe it? – Post hoc analysis of the PIFotal study.

Background: The PIFotal study found that nearly a third of COPD patients on dry powder inhaler (DPI) maintenance therapy did not generate an optimal peak inspiratory flow (PIF) for their device during a typical inhalation manoeuvre.^{1,2} PIF can be assessed by either observing inhalation technique or by measuring it objectively. However, it is unclear whether these methods differ in their accuracy to guide optimal DPI use.

Objective: To compare methods that assess PIF (measured vs. observed) for guiding DPI use, based on their association with health status in COPD patients.

Method: Cross-sectional observational multinational study in 1,389 COPD patients (mean±SD: 69±9yrs) on DPI maintenance therapy. PIF was assessed by 1) videorecording and rated with checklists (i.e. 'inspiratory effort') and 2) measurement at the resistance of patient's DPI with In-Check Dial G16. Health status was assessed with Clinical COPD Questionnaire.

Results: Patients with sufficient inspiratory effort, as assessed with video (n = 987), but with suboptimal PIF (sPIF n = 365), as measured with In-Check Dial G16, had significantly worse health status compared to patients with optimal PIF and sufficient inspiratory effort (Fig. 1, β^* 0.19; 95%CI [0.03, 0.35]; p = 0.02).

Conclusion: Even when PIF was observed to be sufficient, 37% of patients had sPIF when measured. Thus, observations were inadequate to identify sPIF, a factor associated with poorer health status. Objective measurements of PIF should guide the DPI selection process.

** β = estimate of the difference in CCQ-score compared to the reference group (optimal PIF and 'inspiratory flow' sufficient)*

1. Kocks, J. W. H. *et al.* Factors associated with health status and exacerbations in people with COPD who receive maintenance therapy through a Dry Powder Inhaler: the cross-sectional observational PIFotal study. *NPJ Prim Care Respir Med*, **submitted**, (2022).
2. Leving, M. T. *et al.* Impact of PIF, Inhalation Technique and Medication Adherence on Health Status and Exacerbations in COPD: Protocol of a Real-World Observational Study (PIFotal COPD Study). *Pulmonary Therapy* **7**, 591–606 (2021).

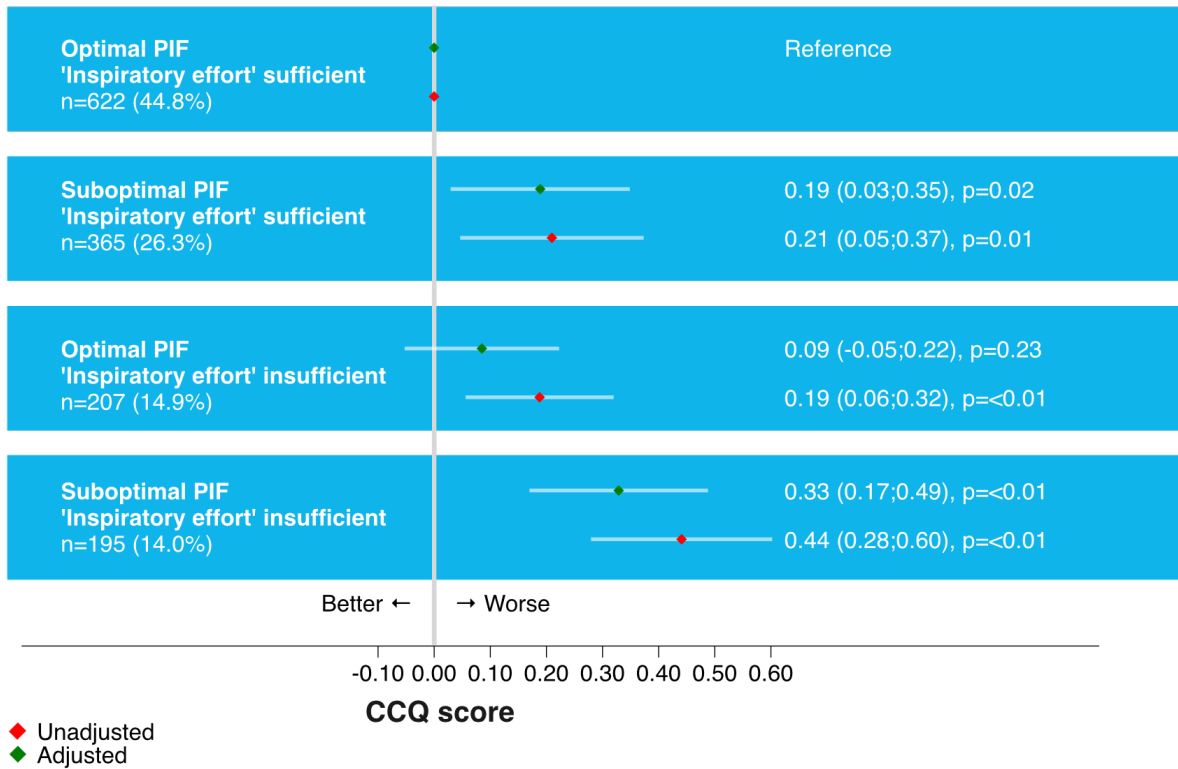


Figure 1. Association of measured PIF and observed 'inspiratory effort' with health status (CCQ score)
 Note: PIF as assessed at the resistance of patient's DPI (In-Check Dial G16); 'inspiratory effort' sufficient or insufficient as assessed by inhalation technique videorecording rating.