

Abstract

Objective: The purpose of this study is to compare objective measures of SGS severity in the form of PFTs with validated patient-reported outcome measures (PROMs). Ultimately, we aim to understand how the disease process as well as patient perception of disease changes over time.

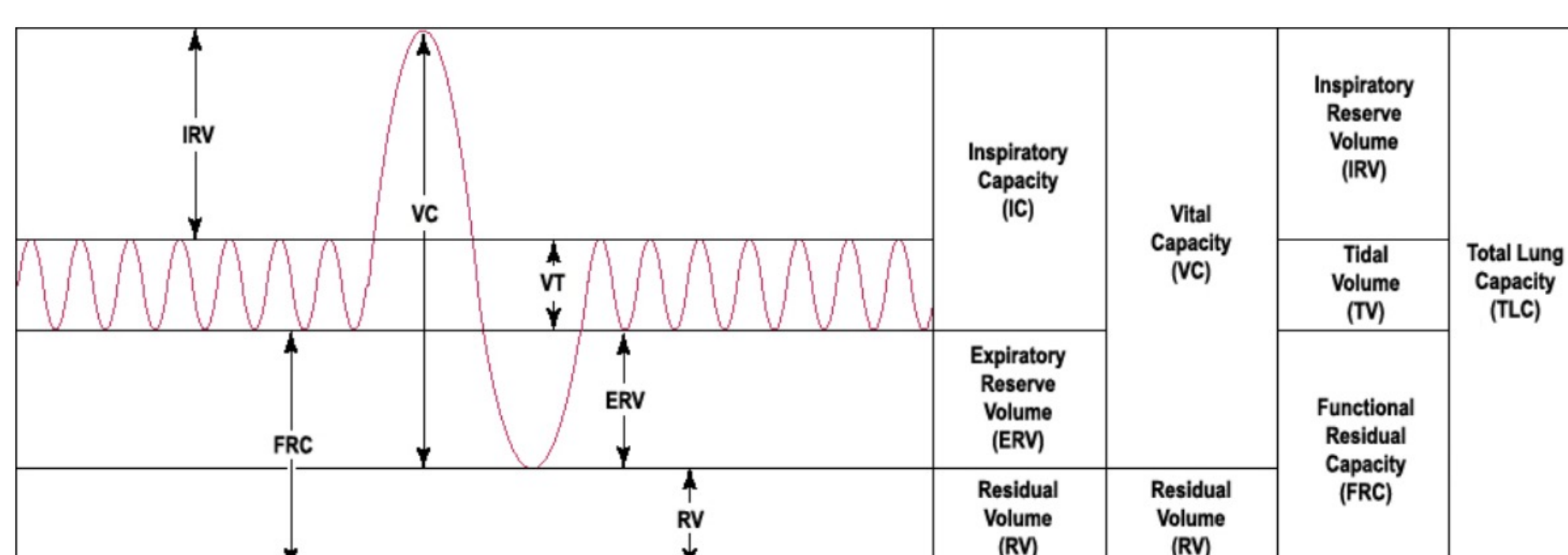
Methods: This is a retrospective case series of 50 patients diagnosed with iSGS evaluated longitudinally at a single tertiary academic medical center from 2015 to 2019. Only patients with multiple PFT results and multiple PROMs (Voice handicap index (VHI-10) and Clinical Dyspnea Questionnaire (CDQ)) were included in the study. The datapoints were then used to calculate the rate of change in PFT measures as well as PROM scores. Simple linear and multiple linear regression analysis was then performed.

Results: A total of 130 observations were used in our analysis. Four key measures of PFTs (FEV1, PEFR, EDI and TPF) were correlated with two subjective measures of PROM using the VHI-10 and CDQ scoring system. Both simple and multiple linear regression models looking into absolute PFT values vs VHI/CDQ scores did not demonstrate any significant correlation with the exception of TPF vs VHI. Similarly, the same models looking into the rate of change in PFT values (Δ PFT) in relation to the rate of change in PROM scores (Δ VHI, Δ CDQ) did not show any significant correlation.

Conclusion: In this small cohort, there is no clear correlation between subjective patient reported outcome and objective severity of iSGS as measured by spirometry.

Background

Idiopathic subglottic stenosis (iSGS) is a rare inflammatory condition that accounts for approximately 15% of all SGS, most commonly presenting as a peri-menopausal Caucasian females. Current management entails on a combination of endoscopic +/- open interventions in addition to adjuvant medical therapy. The frequency and invasiveness of intervention is a shared decision-making process between providers and patients, relying on objective measures of stenosis (endoscopy, imaging, spirometry) as well as self-reported changes in airway symptoms. In our study, we utilized four key measures of PFT/spirometry (FEV1, PEFR, EDI, TPF) as representative of the objective change in this disease process. The value of these spirometry parameters in surveillance and management of iSGS has previously been studied and validated. We then selected two validated survey tools for patient reported dyspnea, VHI-10 and CDQ, to gauge patients' subjective change in stenosis over time.



Methods and Materials

This is a single institution retrospective cohort analysis of patients treated for the diagnosis of iSGS from 2015 to 2019. Every patient included in the analysis underwent multiple PFT studies and completed multiple PROMs (VHI-10 or CDQ). Goodness of fit was tested with simple and multiple regression analysis. Stratified analysis incorporating patient co-morbidities (anxiety, obesity, etc.), length of diagnosis and number of interventions is ongoing.

Results

There were 130 total observations included in analysis from 50 patients fulfilling the inclusion criteria.

Regression analysis did not show any statistically significant correlation between absolute PFT measures when compared to absolute PROM scores with the exception of total peak flow rate and VHI-10 scores. Similar analysis performed between the rate of change in PFT parameters against the rate of change in PROM scores also did not show any R value of statistical significance.

Conclusion & Future Direction

- There is no statistically significant correlation between subjective patient reported outcome and objective severity of iSGS as measured by FEV1, PEFR, EDI and TPF.
- Current PROMs assessing patient's level of upper airway stenosis and subjective experience may be lacking and unreliable. Patient perception of disease and dyspnea symptom may change over time, which further highlights the discrepancy between subjective and objective measures.
- Further subgroup analysis including relevant co-morbid conditions, including anxiety, depression, obesity and systemic inflammatory disease is ongoing in order to identify a potential subset of patients that are more sensitive to disease progression.
- The frequency of airway intervention, as well as modality of intervention (in-office injection, OR endoscopic vs open intervention) will need to be included in future analysis.

Figure 1. Goodness of Fit Analysis comparing absolute PFT values (FEV1, PEFR, EDI, TPF) with absolute VHI-10 ($R^2 = 0.1542$ / Adjusted $R^2 = 0.1271$)

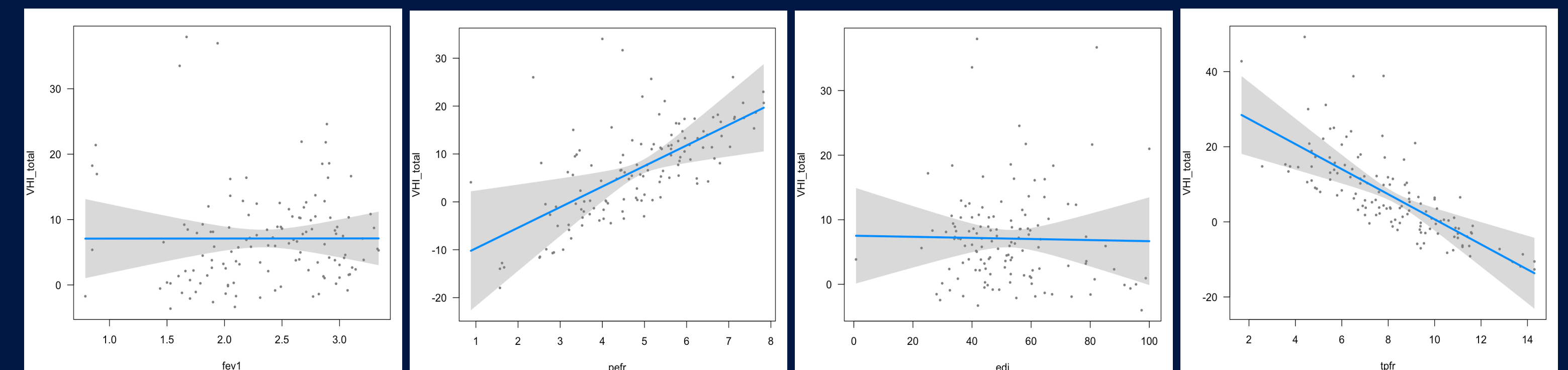


Figure 2. Goodness of Fit Analysis comparing absolute PFT values (FEV1, PEFR, EDI, TPF) with absolute CDQ ($R^2 = 0.0707$ / Adjusted $R^2 = 0.0409$)

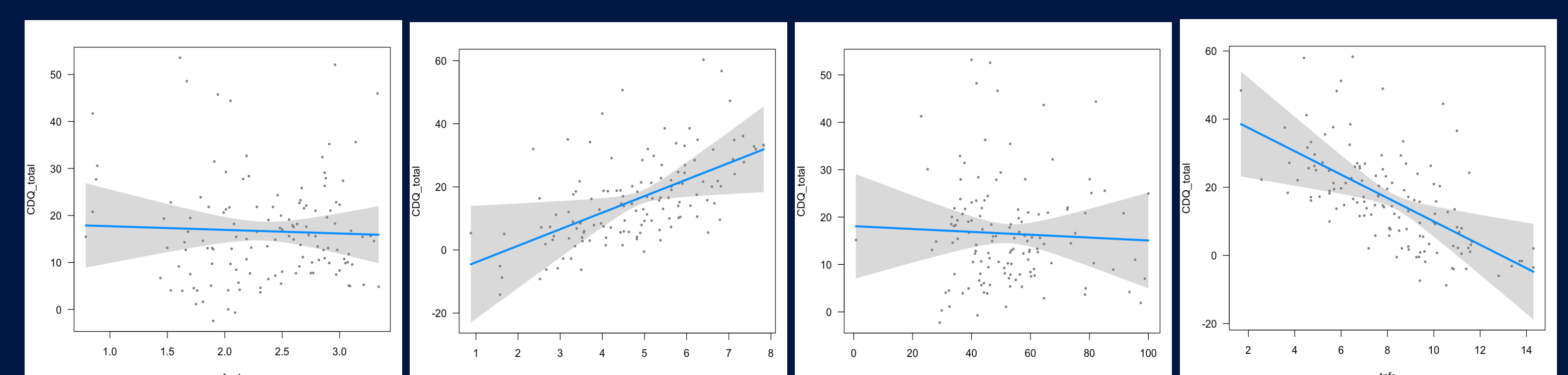


Figure 3. Goodness of Fit Analysis comparing rate of change in PFT values (Δ FEV1, Δ PEFR, Δ EDI, Δ TPFR) with rate of change in VHI-10 (Δ VHI) ($R^2 = 0.0129$ / Adjusted $R^2 = 0.0400$)

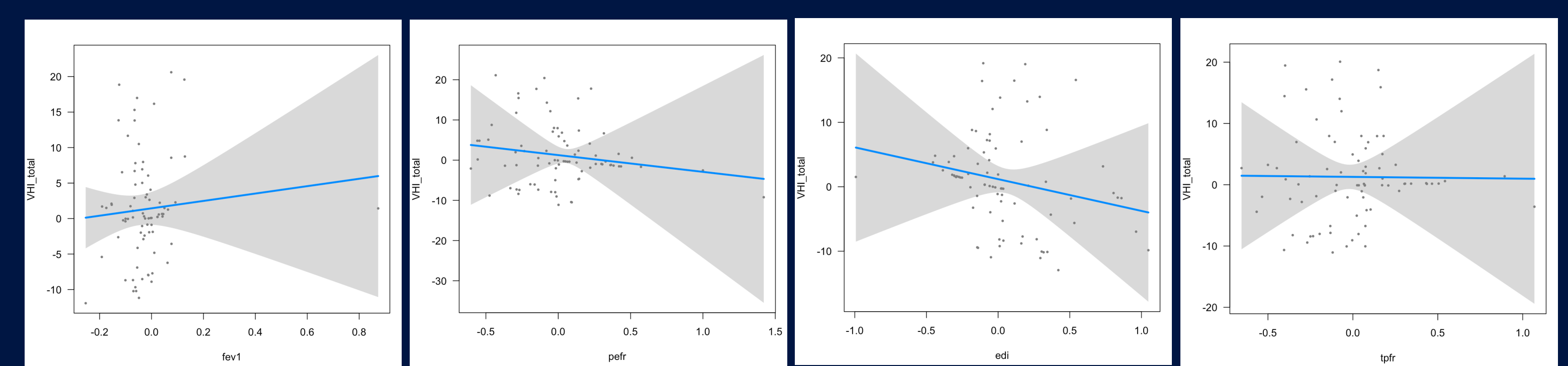
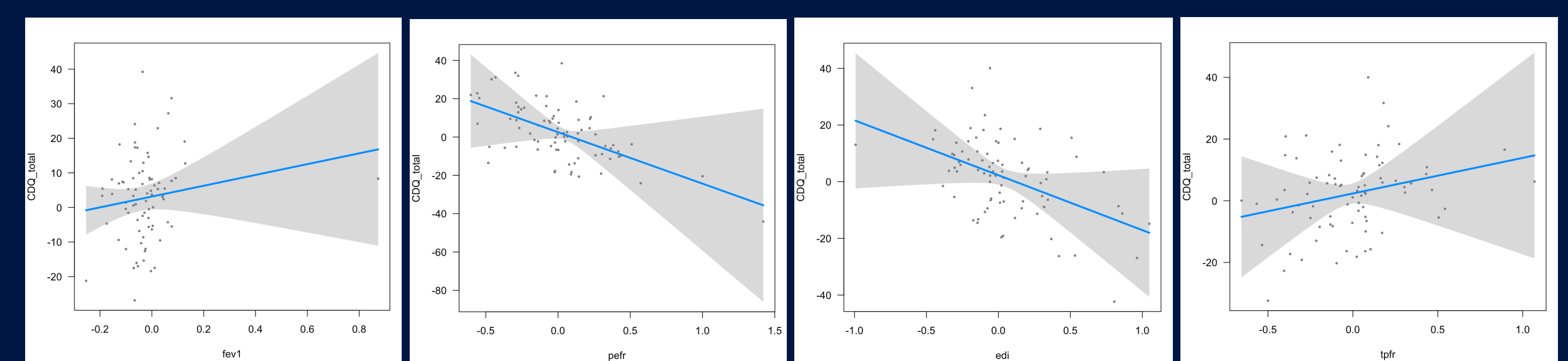


Figure 4. Goodness of Fit Analysis comparing rate of change in PFT values (Δ FEV1, Δ PEFR, Δ EDI, Δ TPFR) with rate of change in CDQ (Δ CDQ) ($R^2 = 0.0676$ / Adjusted $R^2 = 0.0179$)



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