

Baseline COPD in Lung Cancer Patients is Not Associated with Increased Radiation Pneumonitis or Increased Pulmonary Function Decline Following Lung Radiation Therapy

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Purpose/Objectives

- The association between COPD and pulmonary toxicity following thoracic radiation is not fully understood.
- In this study, we review toxicity data from patients treated with IMRT to determine if baseline COPD is associated with increased post-treatment pulmonary toxicity.

Materials/Methods

- Between 05/2008 and 10/2015, lung cancer patients treated with definitive-intent IMRT with baseline and serial post-radiation pulmonary function tests (PFTs) were identified.
- Baseline patient characteristics, treatment details, and subacute and late toxicities were recorded.
- COPD was defined as $FEV1/FVC < 0.7$. CTCAE grade > 2 radiation pneumonitis (RP) was defined as requiring steroids within 12 months following radiation, unrelated to medical comorbidities.
- Post-treatment PFTs were normalized by patient to baseline PFTs and the relative declines were reported in < 6 month and > 12 month time intervals, which were the time intervals representative of the subacute (pneumonitis) and chronic (fibrotic) settings, respectively.
- Determination of baseline COPD status as a predictor for RP and PFT decline following radiation was performed.

Results

Baseline PFT test (% predicted)	COPD (n=100)	No COPD (n=88)	P-value
DLCO	69±22	84±23	<0.001
FEV1	63±20	83±21	<0.001
FVC	81±20	84±21	N.S.

Table 1: Baseline PFT stratified by COPD status: DLCO -- diffusing capacity for carbon monoxide, FEV1 -- forced expiratory volume in one second, FVC -- forced vital capacity. COPD patients had pretreatment DLCO and FEV1 that were significantly lower compared to non-COPD patients.

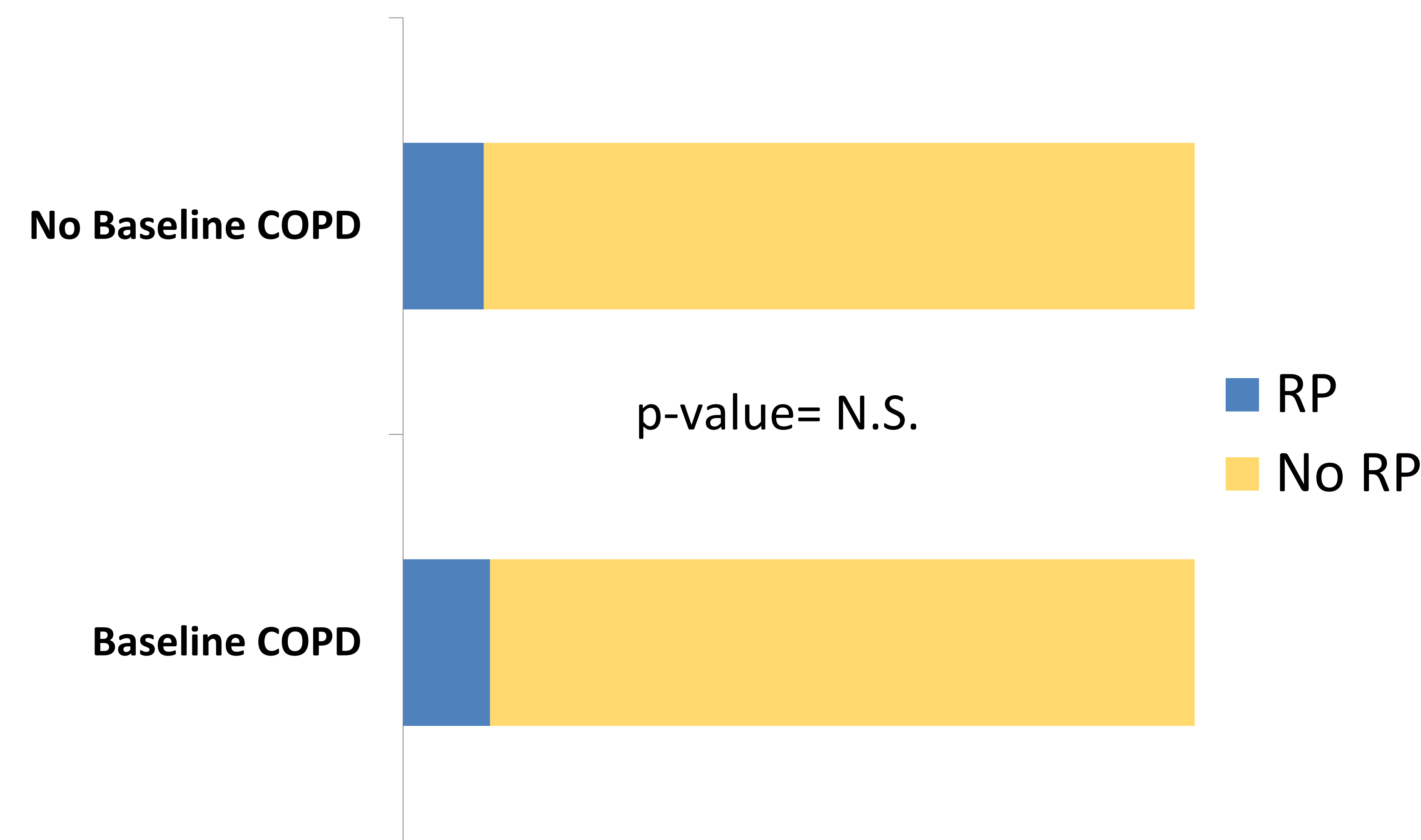


Figure 1: RP stratified by COPD: Baseline COPD did not predict for the development of CTCAE Grade ≥ 2 RP (10.2% vs 11%, non-COPD vs COPD)

Conclusions

- COPD was not associated with relative declines in PFTs or increased CTCAE Grade ≥ 2 RP.
- COPD appears protective against FEV1 and FVC reduction in the subacute setting (< 6 months), but these trends do not persist in the chronic phase (> 12 months).

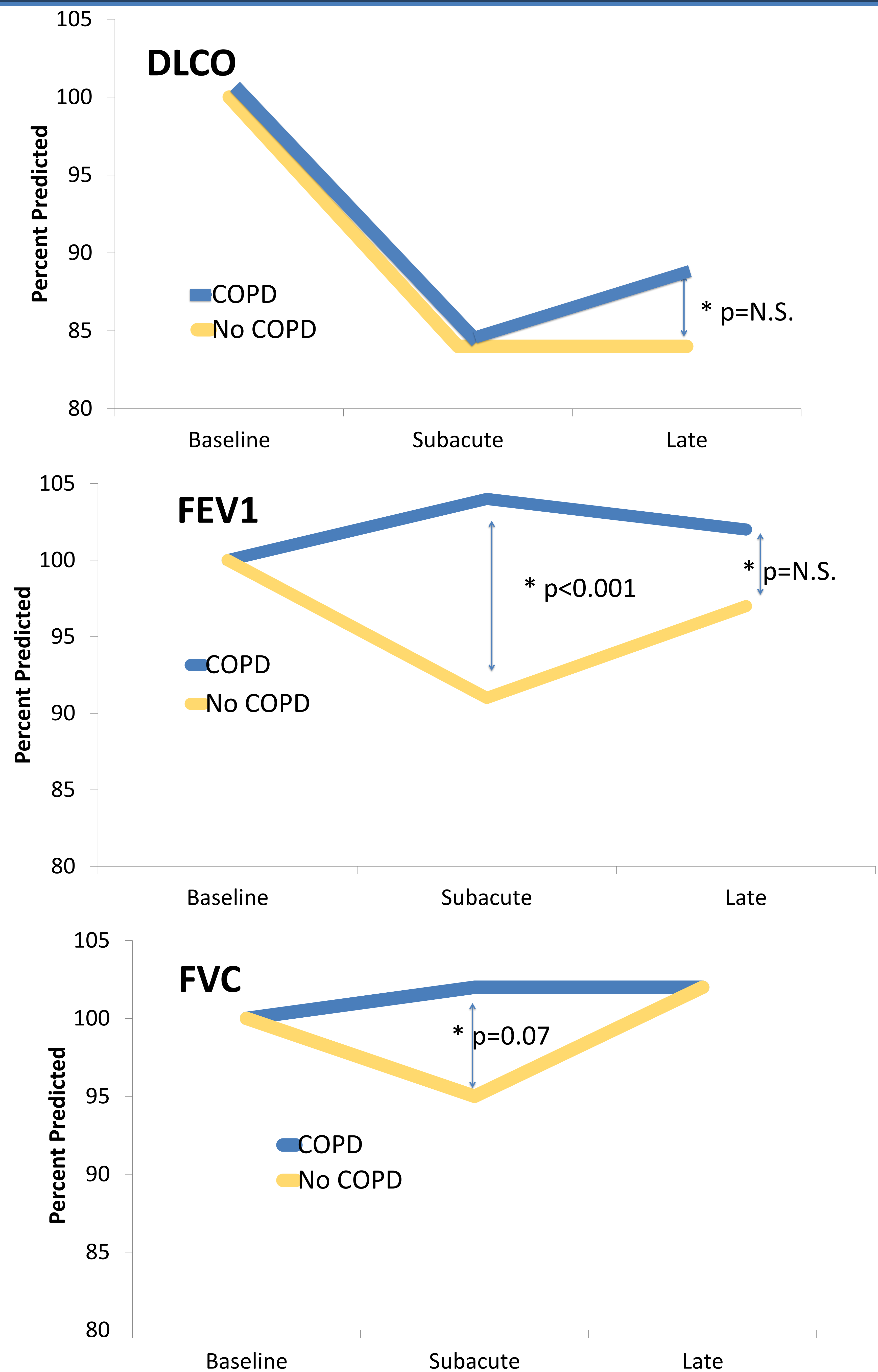


Figure 2: PFT changes stratified by baseline COPD: Mean subacute (< 6 month) and late (> 12 month) percent predicted PFT values normalized to baseline mean PFTs. Patients without baseline COPD had greater relative reductions in FEV1 and FVC in the subacute setting compared with COPD patients. There were no PFT correlations > 12 months post-treatment.