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**Title:** COPD patients with exertional desaturation have a higher risk of rapid lung function decline

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**Body:** BACKGROUND: Until now, no clinical parameter has been suggested as a predictor of rapid lung function decline other than current smoking and emphysema severity in chronic obstructive pulmonary disease (COPD). OBJECTIVE: The main purpose of this study was to explore whether exertional desaturation can predict rapid lung function decline in patients with COPD. DESIGN: A retrospective analysis was performed on 57 patients with moderate to very severe COPD who underwent 6-minute walk test (6MWT). Exertional desaturation was defined as a nadir oxygen saturation of < 90% during the 6MWT. Rapid decline was defined as annual rate of decline in forced expiratory volume in 1 second (FEV<sub>1</sub>) ≥ 50 ml. The patients were divided into rapid decliner (n=26) and non-rapid decliner (n=31) groups. RESULTS: A statistically significant difference was observed between rapid decliner and non-rapid decliner in terms of exertional desaturation (p=0.003). No differences between the groups were found for age, smoking status, BODE index, and FEV<sub>1</sub>. Multivariate analysis showed that exertional desaturation was a significant independent predictor of rapid decline (RR, 6.788; 95% CI, 1.815 to 25.392; p=0.004). CONCLUSION: This study suggests that exertional desaturation is a predictor of rapid decline in lung function in patients with COPD. 6MWT may be useful for predicting rapid decline in COPD.