**EFFECT OF SMOKING ON SPIROMETRY OF AFRICAN AMERICANS AND CAUCASIANS**

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**Abstract:** Smoking is the single most important risk factor for Chronic Obstructive Pulmonary Disease (COPD); yet, there is still disagreement about the differences in the effect of smoking between Caucasians (C) and African Americans (AA). We hypothesized that the results of spirometry between smokers of the two races are equivalent, if reference equations and lower limits of normal appropriate for each race are used. We retrospectively analyzed all spirometries in smokers over a one year period from the G.V. (Sonny) Montgomery VA Medical Center and excluded those that did not meet American Thoracic Society standards for acceptability and repeatability, or from patients with additional medical problems. The remaining patients were divided by race and then matched for age and smoking history; 108 patients in each group were included, which met the power analysis goal of 90. The two groups were similar in age (57.5 vs. 57.0), pack years smoked (46.1 vs. 46.0), and BMI (27.0 vs. 28.3) for AA and C, respectively. Data were analyzed using the unpaired t-test and P values were adjusted for multiple comparisons using the Bonferroni factor. There were statistically significant differences between AA and C smokers in FVC (3.67 ± 0.07 vs. 4.26 ± 0.08, P = 0.001) and FEV₁ (2.33 ± 0.07 vs. 2.72 ± 0.08, P = 0.002), as expected from the normal populations; however, there were no differences in FVC as % predicted (89.1 ± 1.3 vs. 86.7 ± 1.5, P = 0.71) and FEV₁ as % predicted (71.9 ± 2.1 vs. 72.2 ± 1.8, P = 1.00) when the reference equations appropriate for race were used (NHANES III). There were also no differences between the number with abnormal FEV₁/FVC (56 vs. 58, P = 1.00) when the appropriate lower limits of normal were used. Reports in the literature disagree as whether C or AA is more susceptible to the effects of smoking. This disagreement results from two faulty practices used in the analysis of spirometry: cut-offs, and predicted equations for C corrected for race. By applying these erroneous procedures, we mimicked the two conflicting results. By defining normality with a FEV₁/FVC of 70% as the cut-off, rather than the statistically-based lower limits of normal, a larger percentage of C than AA were found to be abnormal. If instead of using the NHANES III equations appropriate for race, we used the C equations adjusted for AA, more AA smokers than C were found to be abnormal. There are no differences in spirometry between AA and C when abnormality is defined appropriately using reference equations and lower limits of normal for each race. By using either % cut-offs for abnormality, or by adjusting for AA equations only appropriate for C, we were able to mimic with our data conflicting results in the literature.