

Online Supplement

Title: Cigarette Smoke Exposure and Radiographic Pulmonary Vascular Morphology in the Framingham Heart Study

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Figure Legends

Figure E1: Difference in BV5/TBV by Pack-Years

*Penalized spline demonstrating difference in BV5/TBV as a function of total pack-years of cigarette smoke exposure. Data were fitted using a penalized spline with 2 degrees of freedom and adjusted for age, sex, height, weight, personal educational attainment, occupation category, quartiles of census tract median neighborhood income, and Framingham Heart Study cohort (Offspring vs. Third Generation). The solid line represents adjusted difference in BV5/TBV and the dashed lines indicate the 95% confidence interval bands. The distribution of pack-years is displayed by the rug plot along the x-axis.

Figure Legends

Figure E2: Difference in BV5 and TBV by Pack-Years

*Penalized spline demonstrating difference in TBV (A) and BV5 (B) as a function of total pack-years of cigarette smoke exposure. Data were fitted using a penalized spline with 6 degrees of freedom and adjusted for age, sex, height, weight, personal educational attainment, occupation category, quartiles of census tract median neighborhood income, and Framingham Heart Study cohort (Offspring vs. Third Generation). The solid line represents adjusted difference in BV5/TBV and the dashed lines indicate the 95% confidence interval bands. The distribution of pack-years is displayed by the rug plot along the x-axis.

Tables

Table E1: Associations of participant characteristics with radiographic pulmonary vascular measures

	Total Blood Vessel Volume (TBV)		Small Vessel Blood Volume (BV5)		Small Vessel Fraction (BV5/TBV)	
	Difference, mL (95% CI)	p-value	Difference, mL (95% CI)	p-value	Difference, pp (95% CI)	p-value
Age (per 10 years)	-1.6 (-2.8, -0.3)	0.01	-1.2 (-1.7, -0.6)	<0.0001	-0.36 (-0.54, -0.18)	<0.0001
Sex (Female vs. Male)	-14.6 (-17.1, -12.2)	<0.0001	-1.5 (-2.6, -0.5)	0.006	3.0 (2.6, 3.3)	<0.0001
Height (per inch)	4.7 (4.4, 5.1)	<0.0001	1.9 (1.8, 2.1)	<0.0001	0.08 (0.03, 0.13)	0.002
Weight (per 10 lbs)	-0.6 (-0.8, -0.3)	<0.0001	-1.0 (-1.1, -0.8)	<0.0001	-0.53 (-0.57, -0.50)	<0.0001
Occupation						
Labor vs. Professional	4.9 (1.6, 8.3)	0.004	1.6 (0.9, 3.1)	0.04	-0.1 (-0.6, 0.3)	0.6
Sales vs. Professional	0.3 (-1.8, 2.4)	0.97	-0.4 (-1.3, 0.5)	0.4	-0.3 (-0.6, -0.04)	0.03
Other vs. Professional	1.1 (-1.2, 3.5)	0.3	-0.01 (-1.0, 1.0)	0.98	-0.3 (-0.7, -0.01)	0.04
Educational attainment						
<High School vs. College Graduate	-4.7 (-12.4, 3.1)	0.2	-3.5 (-7.0, -0.1)	0.04	-1.3 (-2.4, -0.1)	0.03
High School vs. College Graduate	-1.0 (-3.3, 1.4)	0.4	-0.9 (-2.0, 0.2)	0.09	-0.3 (-0.7, 0.02)	0.07
Some College vs. College Graduate	-2.0 (-4.0, -0.03)	0.046	-1.3 (-2.1, -0.4)	0.005	-0.4 (-0.6, -0.07)	0.01
Median neighborhood income (by quartile)						
4 (highest) vs. 1 (lowest)	1.4 (-0.9, 3.7)	0.2	0.09 (-0.9, 1.1)	0.9	-0.3 (-0.7, -0.002)	0.05
3 vs. 1	1.9 (-0.5, 4.3)	0.1	-0.3 (-1.3, 0.8)	0.6	-0.7 (-1.0, -0.3)	0.0002
2 vs. 1	3.0 (0.7, 5.4)	0.01	0.5 (-0.6, 1.5)	0.4	-0.5 (-0.8, -0.1)	0.006
Cohort (Third Generation vs. Offspring)	-1.0 (-3.6, 1.6)	0.5	-0.6 (-1.7, 0.6)	0.3	-0.1 (-0.5, 0.2)	0.5

*Results of fully adjusted linear regression models, including adjustment for all listed covariates and also smoking status and pack-years of cigarette smoke exposure

Tables

Table E2: Comparison of Spirometry and Radiographic Pulmonary Blood Vessel Volumes in Participants with Moderate-to-Severe Obstruction and Remainder of Cohort

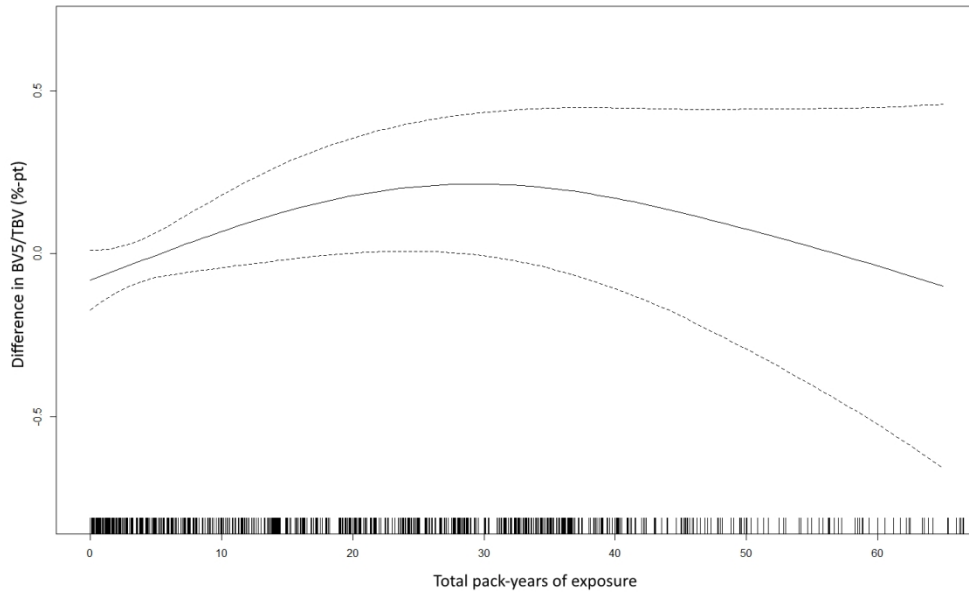
Spirometry	Participants with Moderate-to-Severe Obstruction (n=167)	Remainder of Cohort (n=2,109)	p-value
%-Predicted FEV ₁	67.8 ± 10.1	100.3 ± 12.7	<0.0001
%-Predicted FVC	87.2 ± 11.1	103.0 ± 12.8	<0.0001
FEV ₁ /FVC (%)	59.4 ± 7.7	75.4 ± 5.8	<0.0001
Blood Vessel Volumes			
BV5 (mL)	53.7 ± 11.3	56.1 ± 11.4	0.01
TBV (mL)	141.1 ± 31.4	143.2 ± 30.5	0.39
BV5/TBV (%)	38.4 ± 4.3	39.4 ± 4.1	0.003

Tables

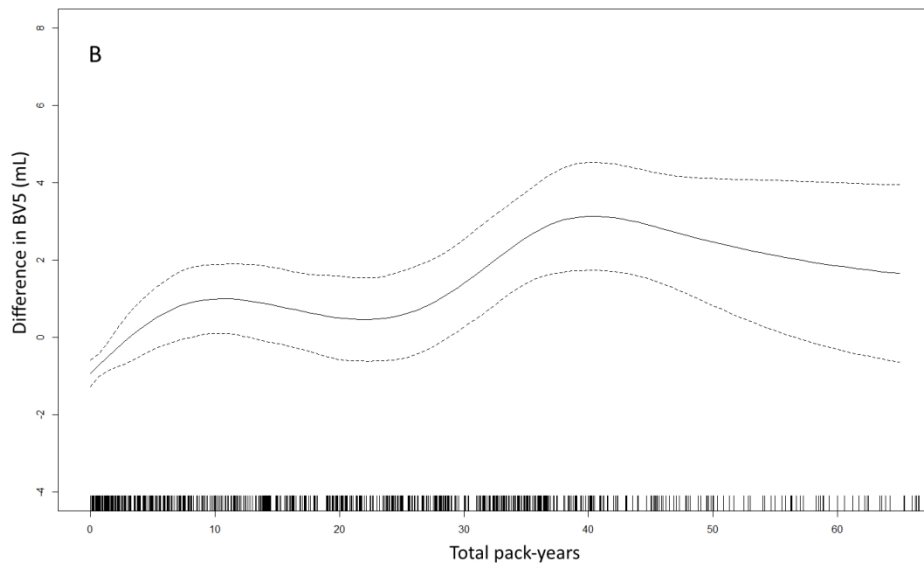
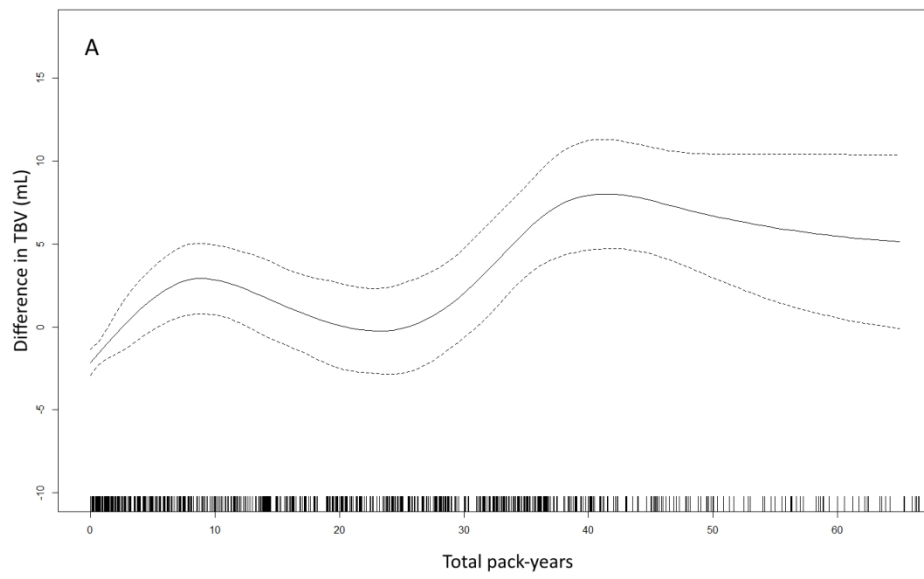
Table E3: Distribution of Cardiac Comorbidities in the Study Sample and by Smoking Status

Comorbidity (n, %)	Overall Cohort (n=2,410)	Never-Smokers (n=1,168)	Former Smokers (n=1,064)	Current Smokers (n=178)
Cardiovascular disease	165 (6.9)	54 (4.6)	99 (9.3)	12 (6.7)
Diabetes mellitus	215 (8.9)	90 (7.7)	110 (10.3)	15 (8.4)
Antihypertensive medication use	862 (35.8)	360 (30.8)	447 (42.0)	55 (30.9)
Statin use	963 (41.1)	413 (36.2)	489 (47.4)	61 (35.5)

*Cardiovascular disease is defined as any cardiovascular event (myocardial infarction, angina pectoris, congestive heart failure, cerebrovascular accident, or death due to cardiovascular disease or stroke) as adjudicated annually by a three-person Framingham Heart Study review committee; diabetes mellitus is defined as a fasting glucose > 126 mg/dL, any diabetic medication use, or any reported history of diabetes (excluding gestational diabetes); antihypertensive medication use is defined as any self-reported use of beta blockers, calcium channel blockers, diuretics, or renin-angiotensin-aldosterone system inhibitors; statin use is defined as any self-reported use of a statin.



Difference in BV5/TBV by Pack-Years



Difference in BV5 and TBV by Pack-Years