Supplemental Material

Associations between Greenness, Impervious Surface Area, and Nighttime Lights on Biomarkers of Vascular Aging in Chennai, India

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Figure S2: Linear regression model for association between an interquartile range (IQR) increase in residential exposure to greenness (IQR = 0.17) on biomarkers of vascular aging stratified by low, moderate and high physical activity.

Table S1: Correlation matrix between built environment measures and participant characteristics.

Variable	ISA	NTL	NDVI	Age	Female	BMI	FBS	Sedentary	Smoke	Anxiety	SES
ISA											
NTL	0.62										
NDVI	-0.74	-0.65									
Age	0.03	0.01	-0.02								
Female	-0.02	-0.01	0.05	-0.20							
BMI	0.03	0.04	0.02	0.05	0.21						
FBS	0.02	0.00	0.00	0.21	-0.02	0.04					
Sedentary	0.06	-0.05	-0.07	0.20	-0.02	0.12	0.08				
Smoke	0.03	0.04	-0.03	0.04	-0.34	-0.11	-0.03	-0.04			
Anxiety	0.06	0.04	-0.07	0.03	0.15	0.03	0.01	0.05	-0.03		
SES	0.10	0.05	-0.10	0.06	-0.33	0.07	0.02	0.08	0.04	-0.20	

Body Mass Index (BMI); Fasting Blood Sugar (FBS); Impervious surface area ratio (ISA); Nighttime lights (NTL); Normalized difference vegetation index (NDVI); Socioeconomic status (SES).

Table S2: Mean and standard deviation of greenness, ISA and NTL by demographic variables.

Characteristics	ISA	Greenness	NTL
Gender			
Female	0.64 (0.15)	0.41 (0.12)	0.09 (0.04)
Male	0.64 (0.15)	0.40 (0.12)	0.09 (0.04)
Age (years)			
< 40	0.64 (0.16)	0.41 (0.12)	0.09 (0.04)
40-50	0.63 (0.12)	0.42 (0.12)	0.09 (0.04)
51-60	0.65 (0.15)	0.40 (0.12)	0.10 (0.04)
60 +	0.65 (0.13)	0.41 (0.12)	0.10 (0.04)
BMI (kg/m²)			
Underweight (<18.5)	0.63 (0.18)	0.40 (0.12)	0.09 (0.05)
Normal weight (18.5–22.9)	0.63 (0.16)	0.42 (0.12)	0.09 (0.05)
Overweight (23–24.9)	0.64 (0.15)	0.41 (0.12)	0.09 (0.04)
Obese (25+)	0.65 (0.15)	0.41 (0.12)	0.09 (0.04)
Socioeconomic score (Quartiles)			
1st	0.62 (0.17)	0.42 (0.12)	0.09 (0.04)
2nd	0.65 (0.15)	0.42 (0.12)	0.09 (0.04)
3rd	0.65 (0.14)	0.40 (0.11)	0.10 (0.04)
4th	0.66 (0.14)	0.40 (0.11)	0.10 (0.04)
Anxiety Score (Quartiles)			
1st	0.61 (0.17)	0.44 (0.12)	0.08 (0.04)
2nd	0.65 (0.15)	0.40 (0.12)	0.10 (0.04)
3rd	0.66 (0.14)	0.39 (0.11)	0.10 (0.04)
4th	0.66 (0.14)	0.40 (0.11)	0.10 (0.04)
Physical Activity			
Low	0.65 (0.15)	0.40 (0.11)	0.10 (0.04)
Moderate	0.65 (0.15)	0.41 (0.12)	0.09 (0.04)
High	0.50 (0.24)	0.47 (0.12)	0.07 (0.05)
Smoking Status			
Smoker	0.65 (0.14)	0.40 (0.12)	0.10 (0.04)
Non-smoker	0.64 (0.16)	0.41 (0.12)	0.9 (0.04)
Energy Intake			
Excess	0.65 (0.14)	0.40 (0.11)	0.10 (0.04)
Adequate	0.64 (0.15)	0.41 (0.12)	0.09 (0.04)
Deficit	0.63 (0.16)	0.42 (0.12)	0.09 (0.04)

Body Mass Index (BMI); Impervious Surface Area (ISA); Normalized Difference Vegetation Index (NDVI); Nighttime Lights (NTL; units are in W/cm2/sr).

Table S3: Univariate linear regression model for effect of an interquartile range (IQR) increase in residential exposure to greenness (IQR = 0.17), ISA (IQR = 0.19) and NTL (IQR = 0.06 W/cm2/sr) on biomarkers of vascular aging.

|	SBP (mmHg)[a] IQR (95%CI)	DBP (mmHg)[a] IQR (95%CI)	cPP (mmHg)[a] IQR (95%CI)	%FMD[b] IQR (95%CI)
ISA	3.12 (2.18, 3.84)	0.99 (0.52, 1.46)	1.96 (1.34, 2.58)	-0.90 (-1.28, -0.51)
NTL	3.46 (2.45, 4.48)	1.10 (0.52, 1.67)	1.29 (0.71, 1.87)	-1.23 (-1.67, -0.79)
Inverse NDVI	5.70 (4.36. 7.03)	1.95 (1.20, 2.71)	3.74 (2.74, 4.75)	-1.75 (-2.35, -1.15)

Impervious surface area ratio (ISA); Nighttime lights (NTL); Normalized difference vegetation index (NDVI); Systolic blood pressure (SBP); Diastolic blood pressure (DBP); central Pulse Pressure (cPP); Flow mediated dilatation (FMD).

Table S4: Multivariable regression model for effect of an interquartile range (IQR) increase in neighborhood (1 km buffer) exposure to greenness (IQR = 0.17), ISA (IQR = 0.19) and NTL (IQR = 0.06) on biomarkers of vascular aging.

|	SBP (mmHg)[a] IQR (95%CI)	DBP (mmHg)[a] IQR (95%CI)	cPP (mmHg)[a] IQR (95%CI)	%FMD[b] IQR (95%CI)
ISA	1.22 (0.47, 1.89)	0.98 (0.27, 1.23)	0.74 (0.32, 1.18)	-0.71 (-1.22, -0.39)
NTL	0.66 (-0.09, 1.08)	0.27 (0.03, 0.58)	0.38 (0.02, 0.77)	-0.92 (-1.32, -0.54)
Inverse NDVI	3.71 (3.18, 4.10)	1.18 (0.74, 1.62)	3.28 (2.62, 3.89)	-1.03 (1.51, -0.72)

Impervious surface area ratio (ISA); Nighttime lights (NTL); Normalized difference vegetation index (NDVI); Systolic blood pressure (SBP); Diastolic blood pressure (DBP); central Pulse Pressure (cPP); Flow mediated dilatation (FMD). (a)Adjusted for age, gender, BMI, Fasting, LDL, sedentary score, smoking status, anxiety score and SES. (b)Adjusted for age, gender, BMI, Fasting, LDL, sedentary score, smoking status, anxiety score, SES and SBP.

Figure S1: Parsimonious multivariable regression model for effect of an interquartile range (IQR) increase in residential exposure to greenness (IQR = 0.17), ISA (IQR = 0.19) and NTL (0.06) measures on biomarkers of vascular aging.
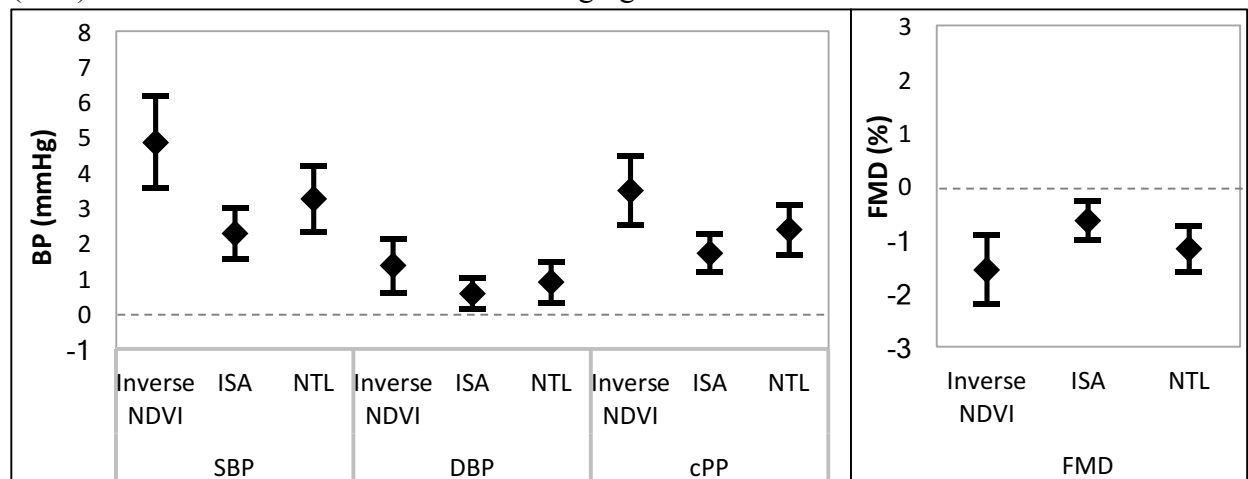
Adjusted for age, gender, BMI and smoking status.

Figure S2: Linear regression model for association between an interquartile range (IQR) increase in residential exposure to greenness (IQR = 0.17) on biomarkers of vascular aging stratified by low, moderate and high physical activity.
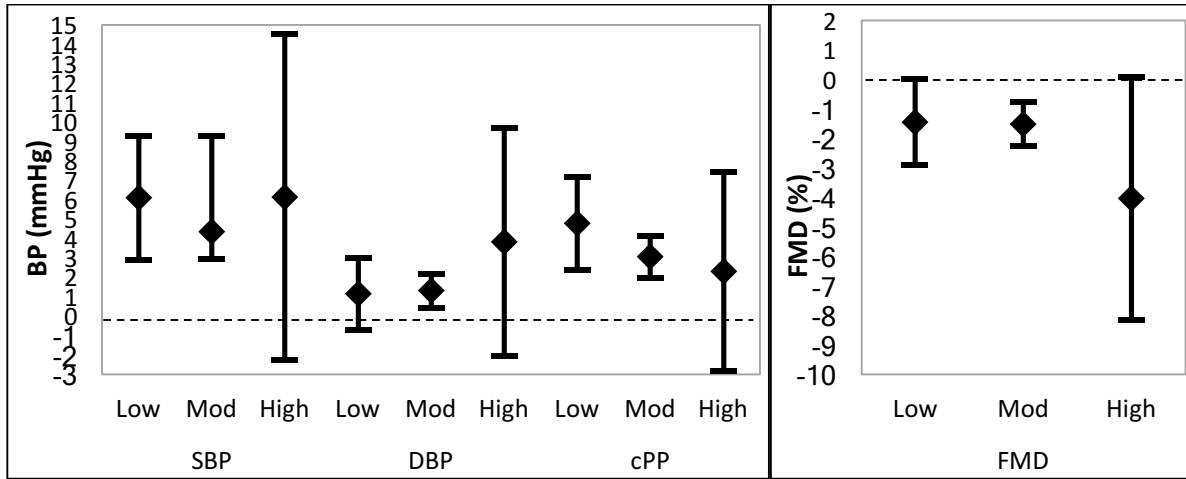
All models Adjusted for age, gender, BMI and smoking status. Moderate physical activity (Mod).