

Appendix

Associations of coke oven emissions exposure with pulmonary function, blood pressure, and blood cell parameter, and biochemical indices in coking workers: a cross-sectional pilot study

Min Sun ^{acd‡}, Xin Li ^{b‡}, Mengmeng Geng ^{acd}, Xiaoling Zhou ^{acd}, Zhiyan Zhang ^{acd},
Huixiang Nie ^b, Na Xia ^{acd}, Guoshun Huang ^e, Xuhong Wang ^e, Hongmei Zhang ^{acd*}

^a Department of Environmental Health, School of Public Health, Shanxi Medical University, Taiyuan 030001, Shanxi, China; ^b Radiological Health Department of TISCO General Hospital, Taiyuan 030003, Shanxi, China; ^c Center for Ecological Public Health Security of Yellow River Basin, Shanxi Medical University, 56 Xinjian South Road, Taiyuan 030001, China; ^d Key Laboratory of Coal Environmental Pathogenicity and Prevention Shanxi Medical University, Ministry of Education, Taiyuan, China; ^e Health Examination Department of TISCO General Hospital, Taiyuan 030003, Shanxi, China.

*Corresponding author: Hongmei Zhang, PhD, Department of Environmental Health, Shanxi Medical University, 56 Xinjian South Road, Taiyuan 030001, China. E-mail: hm.zhang@sxmu.edu.cn.

‡These authors contributed equally to this work.

TABLE S1 Conditions for the urinary phenol measurement using a gas chromatography

TABLE S2 Correlation analysis of plasma Σ_{15} PAHs and 15 PAH homologs

TABLE S3 Correlation analysis of coke oven emissions and health outcomes

TABLE S4 Comparison of the sociodemographic characteristics between the Low PAHs group and High PAHs group ^a [Mean \pm SD or n (%)]

FIGURE S1 Restricted cubic spline (RCS) regression of health outcomes with Σ_{15} PAHs and urinary phenol concentrations.

TABLE S5 Comparison of the sociodemographic characteristics between the Low phenol group and High phenol group ^a [Mean \pm SD or n (%)]

TABLE S1 Conditions for the urinary phenol measurement using a gas chromatography

Item	Parameters
Chromatographic column	Rtx-1701 capillary column (15 m×0.53 mm×1.00 μm)
Split/split less sample injector (SPL)	Temperature: -220.0 °C, Injection method: Split injection, 1 min
Carrier gas	Nitrogen/air
Control mode	Pressure (17.0 kPa)
Column temperature	110.0 °C (balanced for 3 min)
Temperature of the flame ionization detector (FID)	-220.0 °C
Signal acquisition	Sampling speed: 40 msec Stop time: 6 min, Dely time: 0 min
Make-up gas:	Nitrogen/air (nitrogen: 50.0 mL/min, air: 400.0 mL/min, tail flow rate: 30.0 mL/min)

TABLE S2 Correlation analysis of plasma \sum_{15} PAHs and 15 PAH homologs

	PAHs homologs							
	Acy	Ace	Phe	Flu	Flt	Ant	Pyr	BaA
\sum_{15} PAHs	0.59**	0.42**	0.75**	0.78**	0.7**	0.75**	0.67**	0.69**
	Chr	BkF	BbF	BaP	DhA	InP	BgP	
	0.65**	0.68**	0.40**	0.35**	0.35**	0.083*	0.031#	

Note: **: $P < 0.01$; *: $P < 0.05$; #: $P < 0.10$

TABLE S3 Correlation analysis of coke oven emissions and health outcomes

Coke oven emissions	Health outcomes													
	FVC	FEV1	FEV1/FVC	SBP	DBP	WBC	RBC	HGB	PLT	GLU	TC	TG	HDL	LDL
$\sum_{15}\text{PAHs}$	0.04	0.05	-0.01	-0.07	-0.02	0.08	0.06	0.14**	-0.01	-0.03	-0.04	0.01	0.03	-0.06
Phenol	0.13*	0.01	-0.09	0.05	0.08	0.02	0.10	0.12*	-0.16**	-0.02	0.05	0.07	-0.12*	-0.01

Abbreviation: FVC, forced vital capacity; FEV1, forced expiratory volume in 1 second; SBP, systolic blood pressure; DBP, diastolic blood pressure; WBC, white blood cell counts; RBC, red blood cell counts; HGB, hemoglobin; PLT, platelet; GLU, glucose; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein.

Note: **: $P < 0.01$; *: $P < 0.05$.

TABLE S4 Comparison of the sociodemographic characteristics between the Low PAHs group and High PAHs group ^a [Mean \pm SD or n (%)]

Characteristics	Low Σ_{15} PAHs (n = 283)	High Σ_{15} PAHs (n = 283)	χ^2/t	<i>P</i>
Gender (N (%))			8.36	<0.01
Male	256 (90.46)	273 (96.47)		
Female	27 (9.54)	10 (3.53)		
Educational level			7.78	0.02
Junior high school and below	88 (31.10)	59 (20.85)		
Senior high school	90 (31.80)	101 (35.69)		
College and above	105 (37.10)	123 (43.46)		
Age (yrs)	45.75 \pm 7.37	43.23 \pm 8.25	3.83	<0.01
Employment duration (yrs)	26.64 \pm 7.97	23.66 \pm 9.57	4.03	<0.01
BMI (kg/m ²)	25.41 \pm 3.62	24.91 \pm 3.06	1.79	0.07
Tobacco smoking			0.35	0.61
Non smoking	118 (41.70)	125 (44.17)		
Smoking	165 (58.30)	158 (55.83)		
Alcohol drinking			0.07	0.86
Non drinking	171 (60.42)	174 (61.48)		
Drinking	112 (39.58)	109 (38.52)		

Note: a: Subgroups based on the median of the plasma Σ_{15} PAHs concentrations median include low Σ_{15} PAHs group (<8.85 ng/mL) and high Σ_{15} PAHs group (\geq 8.85 ng/mL).

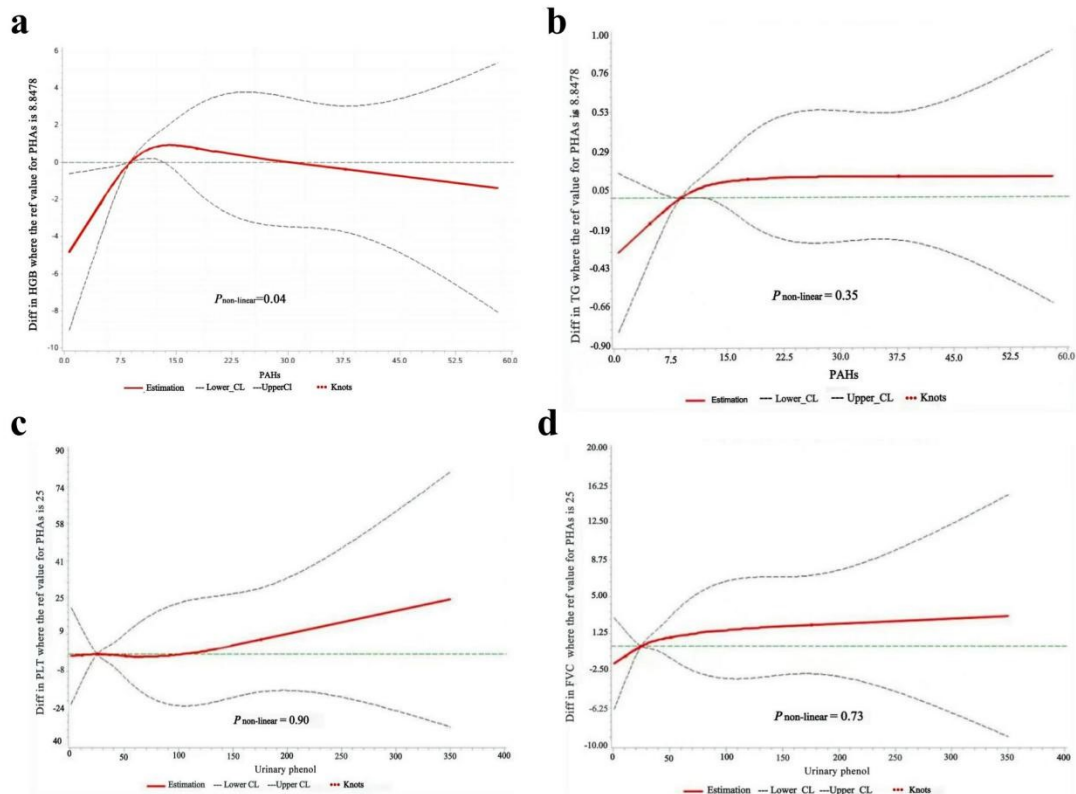


FIGURE S1 Restricted cubic spline (RCS) regression of health outcomes with \sum_{15} PAHs and urinary phenol concentrations.

Note: Panel a~b: Restricted cubic splines regression (RCS) of HGB and TG with \sum_{15} PAHs concentrations, respectively; Panel c~d: Restricted cubic splines regression (RCS) of PLT and FVC with urinary phenol concentrations, respectively.

TABLE S5 Comparison of the sociodemographic characteristics between the Low phenol group and High phenol group ^a [Mean \pm SD or n (%)]

Characteristics	Low phenol subgroup (n = 150)	High phenol subgroup (n = 283)	χ^2/t	<i>P</i>
Gender			0.23	0.79
Male	142	139		
Female	8	6		
Educational level			0.21	0.89
Junior high school and below	34 (22.67)	30 (20.69)		
Senior high school	50 (33.33)	48 (33.10)		
College and above	66 (44.00)	67 (46.21)		
Age (yrs)	44.55 \pm 7.40	42.05 \pm 8.01	1.77	<0.01
Employment duration (yrs)	25.02 \pm 8.65	22.62 \pm 9.14	1.18	0.02
BMI (kg/m ²)	24.82 \pm 3.05	25.17 \pm 3.13	0.17	0.33
Tobacco smoking			0.14	0.73
Non smoking	64 (42.67)	65 (44.83)		
Smoking	86 (57.33)	80 (55.17)		
Alcohol consumption			0.93	0.34
Non consumption	88 (58.67)	93 (64.14)		
consumption	62 (41.33)	52 (35.86)		

Note: a: Subgroups based on the median of the urinary phenol concentrations median include low phenol group (< 6 μ g/mL) and high phenol group (\geq 6 μ g/mL)