

Blood Cadmium Is Associated with Osteoporosis in Obese Males but not in Non-Obese Males: The Korea National Health and Nutrition Examination Survey 2008–2011

Table S1. Effects of blood cadmium on osteoporosis by body site (results of logistic regression analysis using the Korean reference for osteoporosis).

Body Site	Strata (BMI ¹⁾)	Variables	Prevalence of Osteoporosis			Model 1 ⁽³⁾			Model 2 ⁽⁶⁾			Model 3 ⁽⁷⁾		
			Frequency	Weighted Frequency	Prevalence (%)	OR ⁽⁴⁾	95% CI ⁽⁵⁾	<i>p</i> -for-Trend	OR	95% CI	<i>p</i> -for-Trend	OR	95% CI	<i>p</i> -for-Trend
Total hip	<25 kg/m ²	Cd ⁽²⁾ (µg/L)												
		<1.00	14/281	20,124/487,263	4.1	Ref			Ref			Ref		
		1.00~1.50	11/227	16,661/373,098	4.5	1.09	0.44 2.67	0.32	1.00	0.40 2.51	0.34	0.85	0.29 2.47	0.90
		>1.50	15/213	23,119/366,862	6.3	1.57	0.67 3.69		1.59	0.64 3.97		1.08	0.32 3.70	
		Age (years)							1.13	1.08 1.17		1.14	1.09 1.20	
		BMI (kg/m ²)										0.60	0.50 0.72	
		Serum creatinine (mg/dL)										3.44	0.89 13.37	
		Vitamin D deficiency										1.83	0.84 4.00	
		Current smoking										0.74	0.29 1.92	
		Alcohol drinking										1.36	0.38 4.94	
		Physical activity										1.38	0.49 3.91	
	≥25 kg/m ²	Cd (µg/L)												
		<1.00	2/167	3,344/301,348	1.1	Ref			Ref			Ref		
		1.00~1.50	2/119	2,906/226,105	1.3	1.16	0.14 9.81	0.27	0.50	0.03 7.77	0.67	0.88	0.04 19.30	0.66
		>1.50	2/ 82	6,119/154,850	4.0	3.67	0.43 31.57		1.53	0.21 11.04		0.58	0.05 6.45	
		Age (years)							1.25	1.15 1.36		1.27	1.16 1.39	
		BMI (kg/m ²)										0.54	0.29 1.01	
		Serum creatinine (mg/dL)										0.18	0.01 47.32	
		Vitamin D deficiency										1.61	0.21 12.50	

Table S1. Cont.

Body Site	Strata (BMI ⁽¹⁾)	Variables	Prevalence of Osteoporosis			Model 1 ⁽³⁾			Model 2 ⁽⁶⁾			Model 3 ⁽⁷⁾		
			Frequency	Weighted Frequency	Prevalence (%)	OR ⁽⁴⁾	95% CI ⁽⁵⁾	p-for-Trend	OR	95% CI	p-for-Trend	OR	95% CI	p-for-Trend
Femur neck	<25 kg/m ²	Current smoking										4.08	0.22 74.60	
		Alcohol drinking										-	-	
		Physical activity										-	-	
		Cd (µg/L)												
		<1.00	75/281	122,646/487,263	25.2	Ref			Ref			Ref		
		1.00~1.50	57/227	82,968/373,098	22.2	0.85	0.55 1.33	0.94	0.76	0.48 1.22	0.84	0.75	0.45 1.24	0.18
		>1.50	56/213	91,930/366,862	25.1	0.99	0.62 1.59		0.97	0.59 1.60		0.69	0.39 1.20	
		Age (years)							1.11	1.08 1.13		1.11	1.08 1.14	
		BMI (kg/m ²)										0.70	0.63 0.78	
		Serum creatinine (mg/dL)										1.70	0.61 4.72	
	≥25 kg/m ²	Vitamin D deficiency										0.78	0.51 1.20	
		Current smoking										1.43	0.89 2.30	
		Alcohol drinking										1.21	0.65 2.28	
		Physical activity										1.05	0.60 1.83	
		Cd (µg/L)												
		<1.00	14/167	16,414/301,348	1.1	Ref			Ref			Ref		
		1.00~1.50	10/119	21,374/226,105	1.3	1.81	0.70 4.72	<0.01	1.55	0.56 4.30	<0.01	1.78	0.62 5.14	0.01
		>1.50	17/ 82	33,098/154,850	4.0	4.72	1.98 11.28		4.10	1.69 9.98		4.57	1.49 14.01	
		Age (years)							1.10	1.04 1.17		1.10	1.04 1.16	
		BMI (kg/m ²)										0.96	0.72 1.28	
		Serum creatinine (mg/dL)										0.72	0.08 6.14	
		Vitamin D deficiency										0.81	0.35 1.89	
		Current smoking										0.78	0.29 2.10	
		Alcohol drinking										0.38	0.10 1.48	

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			Frequency	Weighted Frequency	Prevalence (%)	OR ⁽⁴⁾	95% CI ⁽⁵⁾	<i>p</i> -for-Trend	OR	95% CI	<i>p</i> -for-Trend	OR	95% CI	<i>p</i> -for-Trend
		<1.00	2/167	1,578/301,348	0.5	Ref			Ref			Ref		
		1.00~1.50	4/119	9,544/226,105	4.2	8.37	1.27 55.19	0.16	8.61	1.25 59.43	0.13	4.41	0.79 24.56	0.44
		>1.50	1/ 82	1,802/154,850	1.2	2.24	0.20 25.14		2.37	0.21 26.26		2.18	0.12 40.11	
		Age (years)							0.97	0.85 1.11		0.99	0.88 1.11	
		BMI (kg/m ²)										1.69	1.33 2.16	
		Serum creatinine (mg/dL)										1.26	0.13 12.57	
		Vitamin D deficiency										2.79	0.45 17.40	
		Current smoking										0.68	0.19 2.41	
		Alcohol drinking										1.10	0.41 2.94	
		Physical activity										1.21	0.30 4.86	

(1) BMI, body mass index (kg/m²); (2) Cd, blood cadmium concentration (lowest tertile (<1.00 µg/L) as a reference); (3) Model 1, unadjusted model; (4) OR, odds ratio; (5) 95% CI, 95% confidence interval; (6) Model 2, adjusted for age; (7) Model 3, adjusted for age, BMI (as a continuous variable), serum creatinine (as a continuous variable), vitamin D deficiency (serum 25(OH)D <20 ng/mL), smoking (current smoker vs non-smoker), alcohol drinking (>7 drinks of alcoholic beverage per time, twice or more in a week: yes or no) and physical activity (vigorous physical activity for more than 20 min per time, 3 times or more in a week: yes or no).