



Supplementary Figure S1. Flowchart of study population inclusion exclusion.

Supplementary Table S1. Detection limit and recovery rate of urine testing instrument

Element	IDLs ($\mu\text{g/L}$)	Thyroid ($n = 51$)	Detection rate (%)	Control ($n = 48$)	Detection (%)	Spiked recovery (%)
Be	0.009	9	17.65	9	18.37	75.2–104.2
Al	5.04	20	39.22	17	34.69	
V	0.0032	51	100.00	46	93.88	84.8–110.0
Cr	0.14	17	33.33	17	34.69	86.2–105.1
Mn	0.06	7	13.73	7	14.29	82.2–105.4
Fe	1.07	42	82.35	40	81.63	85.2–116.0
Co	0.053	4	7.84	19	38.78	80.0–101.9
Ni	0.063	45	88.24	46	93.88	82.8–103.4
Cu	0.11	49	96.08	48	100.00	81.1–105.9
Zn	1.33	51	100.00	48	100.00	83.5–107.1
Ga	0.0028	1	1.96	19	38.78	
As	0.03	51	100.00	48	100.00	91.2–109.6
Se	0.4	44	86.27	47	95.92	81.7–102.9
Sr	0.41	51	100.00	47	95.92	90.5–104.8
Ag	0.13	0	0.00	0	0.00	
Cd	0.0013	51	100.00	48	100.00	80.1–105.5
Cs	0.055	51	100.00	48	100.00	
Ba	0.16	10	19.61	31	63.27	
Tl	0.017	31	60.78	31	63.27	
Pb	0.078	9	17.65	16	32.65	
U	0.0006	2	3.92	7	14.29	

Note. IDLs: Instrumental detection limit.

Supplementary Table S2. Gender and disease distribution in thyroid nodule and control groups

Variables	Thyroid nodule $n = 51$ (%)	Controls $n = 48$ (%)	Chi-square test P -value
Gender			
Male	4 (7.84)	25 (53.06)	< 0.001
Female	47 (92.16)	23 (46.94)	
Thyroid nodule			
No	0 (0.00)	48 (100.00)	< 0.001
Yes	51 (100.00)	0 (0.00)	

Supplementary Table S3. Age distribution in thyroid nodule and control groups

Age (years)	Thyroid nodule <i>n</i> = 51 (%)	Controls <i>n</i> = 48 (%)	Chi-square test <i>P</i> -value
< 20	0 (0.00)	1 (2.08)	0.161
21–30	2 (3.92)	1 (2.08)	
31–40	7 (13.73)	6 (12.50)	
41–50	10 (25.49)	5 (12.50)	
51–60	20 (39.22)	15 (31.25)	
> 60	9 (17.65)	20 (39.58)	

Supplementary Table S4. Various elements and thyroid hormone levels in thyroid nodule and control groups

Serological assays	Thyroid nodule <i>n</i> = 51 (%)	Controls <i>n</i> = 48 (%)	Independent <i>t</i> test <i>P</i>
K (mmol/L)	3.97 ± 0.29	3.99 ± 0.34	0.817
Na (mmol/L)	143.47 ± 1.70**	140.67 ± 4.47	< 0.001
Cl (mmol/L)	106.11 ± 2.27**	103.65 ± 5.71	0.007
Ca (mmol/L)	2.34 ± 0.09	2.30 ± 0.12	0.118
TC (mmol/L)	4.96 ± 1.06	4.85 ± 1.11	0.611
TG (mmol/L)	1.27 ± 0.49	1.73 ± 1.62	0.065
HDL (mmol/L)	1.36 ± 0.25	1.29 ± 0.41	0.289
LDL (mmol/L)	2.99 ± 0.89	2.78 ± 0.88	0.248
TSH (μIU/mL)	2.44 ± 4.18	2.79 ± 3.04	0.636
T3 (nmol/L)	1.52 ± 1.31	1.77 ± 2.48	0.509
T4 (nmol/L)	124.50 ± 34.62	121.97 ± 31.96	0.707

Note. ** Significant at the 0.01 level (two-tailed).