

Supplementary Material: Radioactive Iodine Treatment for Thyroid Cancer Patients Increases the Risk of Long-Term Gastrointestinal Disorders: A Nationwide Population-Based Cohort Analysis

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Table S1. ICD-9-CM codes used in this study for data extraction and analysis.

ICD-9-CM / NHI Code / Definition	
Study population	
Thyroid cancer	193
Thyroidectomy	OP06.4
Intervention: Radioactive iodine treatment	OP92.29, 26038B
Excluding: Other cancers	140–208, except for thyroid cancer
Outcome: Gastrointestinal disorders	Any of the listed
Ulcer	531–534
Gastric ulcer	531
Duodenal ulcer	532
Peptic ulcer	533
Gastrojejunal ulcer	534
Malignant neoplasm of stomach	151
Atrophic gastritis	535.1
Comorbidities	
<i>Helicobacter pylori</i> infection	041.86
Obesity	278
Alcoholism	303, 305.0, V11.3
Chronic lymphocytic thyroiditis	245.2
Celiac disease	579.0
Charlson Comorbidity Index Revised (CCI_R)	CCI removed cancer, and peptic ulcer disease

ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; NHI, national health insurance; CCI_R, revised Charlson comorbidity index

Table S2. Years to Develop Gastrointestinal Disorders.

RAI	Min	Median	Max	Mean ± SD
With	0.02	3.19	12.95	3.82 ± 3.01
Without	0.09	3.39	11.53	3.81 ± 2.78
Total	0.02	3.22	12.95	3.82 ± 2.97

RAI, radioactive iodine; SD, standard deviation

Table S3. Risk factors analysis for gastrointestinal disorders stratified by variables listed in the table by using Cox regression.

RAI Stratified	With			Without			With vs. Without (Reference)				
	Events	PYs	Rate (per 10 ⁵ PYs)	Events	PYs	Rate (per 10 ⁵ PYs)	Ratio	Adjusted HR	95% CI	95% CI	p
Total	218	12,034.78	1811.42	42	3169.54	1325.11	1.367	1.314	1.040	1.842	0.029*
Gender											
Male	65	2379.52	2731.64	12	620.67	1933.41	1.413	1.361	1.052	2.001	0.015*
Female	153	9655.26	1584.63	30	2548.88	1176.99	1.346	1.265	0.703	1.796	0.398
Age groups (years)											
20–39	16	2169.31	737.56	5	684.20	730.78	1.009	1.114	0.663	1.902	0.688
40–59	77	5297.00	1453.65	18	1350.02	1333.31	1.090	1.135	0.468	2.684	0.735
60–79	90	3719.21	2419.87	14	911.05	1536.68	1.575	1.199	1.052	3.402	0.009*
≥ 80	35	849.27	4121.18	5	224.26	2229.51	1.848	1.742	1.197	3.241	0.001*
Helicobacter pylori infection											
Without	218	12,034.66	1811.43	41	3162.27	1296.54	1.397	1.310	1.037	1.831	0.031*
With	0	0.12	0.00	1	7.27	13,761.92	0.000	0.000	-	-	0.999
Obesity											
Without	218	12,034.71	1811.43	42	3169.44	1325.15	1.367	1.314	1.040	1.842	0.029*
With	0	0.07	0.00	0	0.10	0.00	-	-	-	-	-
Alcoholism											
Without	218	12,033.40	1811.63	42	3165.01	1327.01	1.365	1.314	1.040	1.842	0.029*
With	0	1.39	0.00	0	4.53	0.00	-	-	-	-	-
Chronic lymphocytic thyroiditis											
Without	218	11,841.83	1840.93	42	3121.41	1345.55	1.368	1.314	1.040	1.842	0.029*
With	0	192.95	0.00	0	48.13	0.00	-	-	-	-	-
Celiac disease											
Without	218	11,648.89	1871.42	42	3075.67	1365.56	1.370	1.314	1.040	1.842	0.029*
With	0	352.89	0.00	0	96.87	0.00	-	-	-	-	-
Thyrogen											
Without	205	11,575.45	1770.99	40	3060.57	1306.95	1.355	1.308	1.035	1.824	0.031*
With	13	459.33	2830.21	2	108.97	1835.57	1.542	1.529	1.098	1.876	0.001*
Levothyroxine dose											
< 33% (60 µg / day)	109	6173.25	1765.68	28	2135.27	1323.97	1.347	1.282	1.016	1.797	0.037*
≥ 33% (60 µg / day), < 67% (128 µg / day)	75	3991.22	1879.12	9	661.08	1327.61	1.380	1.361	1.078	1.909	0.011*
≥ 67% (128 µg / day)	34	1870.31	1817.88	5	373.19	1327.23	1.357	1.317	1.042	1.845	0.027*

Adjusted HR means adjusted for variables listed in the table. PYs = Person-years; RAI, radioactive iodine; HR, hazard ratio; CI, confidence interval; * $p < 0.05$.