

Incidence of thyroid microcarcinoma in relation to gender and age in non-toxic thyroid diseases treated with total thyroidectomy



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Introduction- Objective

Thyroid cancer comprises the most common endocrine malignancy (~90%) and ~1% of all malignant tumours. The rate between females and males is 2-3:1.

Established risk factors for differentiated thyroid cancer (DTC):

1. Head and neck radiation for a variety of illnesses, mainly at child- and adolescent age
2. Iodine deficiency
3. Gene mutations with activation of oncogenes or loss of the function of genes, which inhibit the activity of oncogenes.

There appears to be a poor relationship of thyroid cancer with racial- demographic factors, origin, nutritional habits, etc.¹

A variety of clinical studies worldwide have examined the incidence of microcarcinomas in benign thyroid disorders (rate 5.0-22.0%).^{2,3,4}

Objective of the present retrospective study was the assessment of the possible influence of age and gender parameters in the presence of thyroid microcarcinoma in a patient cohort with non-autonomous thyroid disorders and without cytological establishment of thyroid cancer who underwent total thyroidectomy.

Patients and Methods

Between 2005-2010 186 patients (146 females/ 46 males - 79,8% / 20,2%) underwent total thyroidectomy because of non-toxic goiter with a solitary nodule (STN) or multiple nodules (multinodular goiter; MTG). The classification of patients in both genders was conducted in the following age-groups: a= 20-39 y, b= 40-59 y, c=>60 y. The surgical specimens were histopathologically examined at the University Pathology Department for the establishment of the final diagnosis of benignity or malignancy. Thyroid cancer cases were categorised in relation to gender and age group.

Exclusion criteria were the following: 1. Any type of previous thyroidectomy, 2. Any history of head and neck radiation, 3. Any cytological diagnosis of thyroid malignancy.

Results

32 patients (17.2%) were diagnosed with incidental thyroid microcarcinoma (ITC) (rate females:males 2.2:1), while 154 patients (82.8%) were free of thyroid malignancy. Specifically: 30 subjects (93.75%) had DTC [26 papillary (81.25%) and 4 follicular thyroid cancer (12.5%)]
1 medullary (3.125%)
1 anaplastic (3.125%)

The incidence of thyroid cancer in male subjects was 25.0% (10/40) and mainly in the subgroup of solitary nodule compared to multinodular goiter (41.67% vs 17.86%). The respective cancer frequency in female subjects was 15.0% (22/146).

Variation of preoperative diagnoses according to gender

Gender	Non-toxic STN	Non-toxic MTG	Total
Males	12	28	40
Females	22	124	146
Total	34	152	186

Prevalence of thyroid cancer in males

Diagnosis	No of patients	ITC (%)
STN	12	5 (41.67)
Non-toxic MTG	28	5 (17.86)
Total	40	10 (25.0)

Prevalence of thyroid cancer in females

Diagnosis	No of patients	ITC (%)
STN	22	6 (27.3)
Non-toxic MTG	124	16 (12.9)
Total	146	22 (15.0)

There was no statistically significant difference in the incidence of thyroid microcarcinoma between males and females ($p=0.140$; odds ratio 1,88, 95% ci 0.81-4.38)

Prevalence of thyroid cancer in the different age groups

Gender	a (20-39 y)	b (40-59 y)	c (>=60 y)	p value
Males	4/9 (44.4)	1/15 (6.67)	5/16 (31.25)	0.089
Females	7/40 (17.50)	9/73 (12.30)	6/33 (18.20)	0.65

Comparison of ITC incidence between males and females per age group

Age group	Males (% Ca)	Females (% Ca)	p value	Odds ratio (OR)
a (20-39 y)	4/9 (44.4)	7/40 (17.50)	0.080	3.77
b (40-59 y)	1/15 (6.67)	9/73 (12.30)	0.529	0.51
c (>=60 y)	5/16 (31.25)	6/33 (18.20)	0.304	2.05

The prevalence of ITC was statistically significant higher (~4 times) in males 20-39 years compared to women of the same age range. There was no statistically significant difference in the other age groups.

Conclusions

Thyroid microcarcinoma shows an elevated incidence in males with non-toxic goiter, especially in the age groups 20-39 y and >60 y. Total thyroidectomy appears to be the therapeutic method of choice in men with indication of surgical removal of an euthyroid goiter which belong to the above age groups. Contrarily, there is no statistically significant variation of microcarcinoma incidence in women with benign thyroid disorders in relation to age.

- References:** 1. Nagataki, S, Nyström, E. Epidemiology and primary prevention of thyroid cancer. *Thyroid* 2002; 12:889.
2. Miccoli P, Minuto MN, Galleri D, et al. Incidental thyroid carcinoma in a large series of consecutive patients operated on for benign thyroid disease. *Anz J Surg* 2006; 76:123e126.
3. J Smith, X Chen, D Schneider, JT Broome, RS Sippel, H Chen, CC Solorzano. Cancer after Thyroidectomy: A Multi-Institutional Experience with 1,523 Patients. *J Am Coll Surg* 2013; 216:571e579.
4. Askitis D, Efremidou EI, Karanikas M, Mitrakas A, Tripsianis G, Polychronidis A, Liratzopoulos N. Incidental thyroid carcinoma diagnosed after total thyroidectomy for benign thyroid diseases: incidence and association with thyroid disease type and laboratory markers. *Int J Endocrinol.* 2013; 2013:451959.