

Ten-year Comparison of the Prevalence of Thyroid Cancer in the Neck With Retrosternal Thyroid in Shahid Beheshti and Ayatollah Rouhani Hospitals in Babol, Iran

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Background: Any deviation in the normal descent of the thyroid gland can lead to ectopic thyroid. In this study ten-year comparison of the prevalence of cervical thyroid cancer with retrosternal thyroid was performed.

Objectives: By knowing prevalence of the disease actions may be performed to know the risk factors associated with the disease. The purpose of this study was to compare the prevalence of cervical thyroid cancer with retrosternal thyroid in Shahid Beheshti and Ayatollah Rouhani Hospitals in Babol, Iran, during 2000 - 2010.

Materials and Methods: This cross-sectional study was performed on 158 patients referred to Shahid Beheshti and Ayatollah Rouhani Hospitals in Babol City, Iran, during 10 years (from 2000 - 2010). Demographic characteristics, smoking, family history of thyroid cancer, the signs and symptoms and pathology reports were collected in a checklist format.

Results: From a total of 158 patients with thyroid cancer, 144 cases were diagnosed with cervical thyroid and 14 cases diagnosed with retrosternal thyroid. In both groups, dyspnea and hoarseness were the most prevalent symptoms. The pathology report showed that in the cervical thyroid, benign cases were more than malignant cases but in retrosternal thyroid, the opposite happened.

Conclusions: The prevalence of cervical thyroid was 91.1% and the prevalence of retrosternal thyroid was about 8.9%. The prevalence rates of malignancy in the cervical and retrosternal thyroid were 34.7% and 21.4%, respectively.

Keywords: Thyroid Nodule; Thyroid Gland; Goiter

1. Background

The thyroid gland is the largest endocrine that weighs about 15 - 20 g, and is located in the anterior neck. Any deviation from the normal descent of the thyroid gland can lead to ectopic thyroid (1). If more than 50% of the thyroid gland is located in the mediastinum, it is called a retrosternal goiter (2). Thyroid cancer is occurred due to uncontrolled thyroid gland cells of thyroid cancer in the thyroid gland. The prevalence rate of thyroid cancer in women is more than twice that in men (1). Types of thyroid cancer include papillary, follicular, medullary, and anaplastic lymphoma. Papillary carcinoma is the most common and the most benign type of thyroid cancer (3). An important sign of cancer is a nodule in the thyroid, but most types of thyroid cancers do not have any symptoms (1). Other symptoms of thyroid cancer noted as hoarseness, esophageal and tracheal compression, such as shortness of breath, neck pain, and pressure when swallowing and also swollen lymph nodes (1). After the

detection of nodules, examination is the first action and in order to determine whether it is benign or malignant, procedures including fine-needle aspiration, and radioisotope scan should be done (1). Treatment of thyroid cancer, depending on tumor stage and tumor type, is different and includes surgery, radioactive iodine and radiotherapy (1). Benign enlargement of the thyroid gland, which increases its volume and appears as big nodule in the throat, neck and posterior to the sternum is called a goiter. According to our initial published research in different sources in Iran, comprehensive information on the cancer prevalence of a retrosternal and neck goiter has not been obtained. Therefore, considering all thyroidectomy cases during the last ten years, comprehensive information can be provided on the case of thyroidectomy and symptoms of thyroid disease in cancer patients.

2. Objectives

By knowing prevalence of the disease actions may be

performed to know the risk factors associated with the disease. The purpose of this study was to compare the prevalence of cervical thyroid cancer with retrosternal thyroid in Shahid Beheshti and Ayatollah Rouhani Hospitals of Babol City, Iran, during 2000 - 2010.

3. Materials and Methods

In this cross-sectional study, all the patients diagnosed with thyroid cancer that underwent thyroidectomy by two surgeons in Rouhani and Shahid Beheshti Hospitals (Babol City, Iran) during 2000 - 2010 were enrolled. To collect data, at first by using the recorded codes for thyroid surgery in the operating room in the hospital, all cases of thyroidectomy from 2000 - 2010 were extracted and the patients' files were retrieved from the case records. The checklist is based on age, gender, residence location, family history of thyroid cancer, history of radiotherapy, obesity, dysphagia, dyspnea, pain, hoarseness and pathological reports including diagnosis of the cancer type and its code based on International Classification of Diseases for Oncology (ICD-O) (4). Data were analyzed using SPSS software version 20, t-test and chi-square test. A t-test was used to compare the means of a normally distributed interval dependent variable for two independent groups like age and cancer. The chi-square test was used to determine the associations between the two variables like baseline characteristics, clinical signs and pathology report in two groups.

4. Results

Out of 158 patients with thyroid cancer, 144 cases (91.1%) had cervical thyroid and 14 cases (8.9%) had retrosternal thyroid. Sixteen patients (10.1%) were males and 142 patients (89.9%) were females ($P = 0.99$). The mean age of male patients was 48.25 ± 13.25 years old while the female patients were 42.23 ± 13.42 years. Ninety-four patients (59.5%) lived in towns and 64 patients (40.5%) resided in villages. In terms of family history and radiotherapy record, there was one case (7.0%) in cervical thyroid group, no cases were found in the retrosternal thyroid ($P = 0.99$) (Table 1). Clinical signs including obesity, dysphagia, dyspnea, pain, hoarseness were also studied (Table 2). Graves' disease has been reported in 6 cases (4.2%) in the cervical thyroid group. Other pathologies were few that were not statistically significant ($P = 0.38$) (Table 3). From a total of 158 patients, 50 patients with cervical thyroid (34.7%) and 3 patients with retrosternal thyroid (21.4%) had cancer ($P = 0.38$). The mean age of the patients with cancer was 39.81 ± 12.10 years, while the patients without cancer was 44.37 ± 13.94 years old ($P = 0.04$). The prevalence of cervical thyroid cancer was 8.86% with confidence interval of (CI 95%: 4.38 - 13.34), also the prevalence of total cancer was 33.54% with confidence interval of (CI 95%: 24.31 - 38.98) ($P = 0.38$).

Table 1. Baseline Characteristics

Variables	Cervical Thyroid	Retrosternal Thyroid	P Value
Age, y	42.50 ± 13.28	46.36 ± 15.48	0.30
Gender^a			0.99
Male	15 (10.4)	1 (7.1)	
Female	129 (89.6)	13 (92.9)	
Residence^a			0.78
Urban	85 (59.0)	9 (64.3)	
Rural	59 (41.0)	5 (35.7)	
Family History^a			0.99
No	143 (99.3)	14 (100)	
Yes	1 (0.7)		
History of Radiotherapy^a			0.99
No	143 (99.3)	14 (100)	
Yes	1 (0.7)		

^a Data are presented as No. (%).

Table 2. Clinical Signs in Groups, Cervical Thyroid and Retrosternal

Variables	Cervical Thyroid ^a	Retrosternal Thyroid ^a	P Value
Obesity			0.99
No	131 (91.0)	13 (92.9)	
Yes	13 (9.0)	1 (7.1)	
Dysphagia			0.52
No	112 (77.8)	10 (71.4)	
Yes	32 (22.2)	4 (28.6)	
Dyspnea			0.75
No	101 (70.1)	11 (78.5)	
Yes	43 (29.9)	3 (21.5)	
Pain			0.99
No	138 (95.8)	14 (100)	
Yes	6 (4.2)	0 (0)	
Hoarseness			0.46
No	119 (82.6)	13 (92.9)	
Yes	25 (17.4)	1 (7.1)	

^a Data are presented as No. (%).

Table 3. Pathology Report^a

Variables	Cervical Thyroid ^b	Retrosternal Thyroid ^b	P Value
MNG + NG + CG + CN	88 (61.1)	11 (78.6)	0.25
Greaves	6 (4.2)		0.99
Papillary Carcinoma	38 (26.4)	3 (21.4)	0.99
Hurthle Cell Adenoma	6 (4.2)		0.99
Follicular Adenoma	6 (4.2)		0.99

^a Abbreviations: CG, colloid goiter; CN, colloid nodule; MNG, multinodular goiter; NG, nodular goiter.

^b No. (%).

5. Discussion

The prevalence of retrosternal goiter in the general population is 1 out of 5000 (2). The majority of cervical and retrosternal goiters are extensions and enlargement of thyroid gland. However, in some studies the prevalence of thyroid cancer has been reported up to 23% in retrosternal goiter (5).

In a study conducted by Razmpa et al. in Imam Khomeini Hospital, Tehran on 320 patients with thyroid cancer during 2007-2008, the mean age of patient was reported to be 50.2 ± 15.6 years and the ratio of female to male was 1.5 (6). Bizakis et al. in Greece conducted a 14-year study on 591 cases of thyroidectomy among which there were 37 cases of retrosternal thyroid, in the study, the mean age for the women was 57.1 years and 61 years for men. The proportion of female to male was 3 (7). In our study, the mean age was 42.50 ± 13.28 years for the patients with cervical thyroid and 46.36 ± 15.48 years for those with retrosternal thyroid.

Pang et al. in Iceland in 2007 carried out a study on 480 patients with thyroid cancer. For benign and malignant cases, the mean age was 47.9 ± 00.0 and 48.1 ± 00.0 years, respectively. The ratio of female to male was reported 2.8, which are consistent with our results. The most common symptoms among patients were painful nodules (6.7%), hoarseness (6%), and dysphagia (6%). In terms of pathology, nodular goiter was 47.9%, and papillary carcinoma was 77% (8). Mofid et al. in 1998 in Taleghani Hospital carried out a study on 5299 patients who had undergone thyroidectomy. Patients' mean age was 35 ± 12 years and the female to male ratio was 1.57. In terms of pathology, 58% multinodular goiter, 64% papillary carcinoma and 25% hurthle-cell tumor were reported (9).

Modarres et al. investigated 441 thyroidectomy cases among which 26 cases had substernal thyroid with mean age of 53.82 ± 15.79 and 77.3% were females. The most common symptoms were dyspnea, dysphagia and neck mass. Pathology report showed that 12 cases had multinodular goiter, Hashimoto's thyroiditis, carcinoma follicular and papillary carcinoma, 5 cases has colloid goiter and 2 cases had follicular adenoma (10). In another study conducted in America by Netterville et al. on 23 patients with retrosternal thyroid, the mean age was 59.0 ± 00.0 years and 78% of the patients were female. Symptoms such as shortness of breath, asphyxia, dysphagia, and hoarseness were the most common symptoms. In terms of pathology, 70% multinodular goiter and 17% malignancy were reported (11).

Sakkary et al. during 2001 - 2011 carried out a study on 1481 thyroidectomy cases out of which 73 cases were retrosternal thyroid. The most common symptoms were dyspnea and neck mass. In pathology report, 83.3% were malignant cases and 16.7% benign cases, which is consistent with the results of the present study (12).

In a study in Ahvaz conducted in 2005 on 100 patients with thyroid cancer by Talaiezhade et al. dyspnea was con-

sidered as the most common symptom. The most common diagnosis reported in pathology was multinodular goiter and papillary carcinoma (13). Ben Nun, A et al. studied 75 cases of retrosternal thyroid that underwent thyroidectomy in 1990 and 2005. According to this study, the most common symptoms were shortness of breath and asphyxia. In terms of pathology, 88% of the cases were benign while 12% were reported as malignant (14). In this study, based on the results of pathology report, in cervical thyroid there are more benign cases in cervical thyroid than malignant ones, while in retrosternal thyroid, the opposite is true. These results are in agreement with those reported by Talaiezhade et al. (13). Due to the low number of cases in retrosternal thyroid, further studies need to be performed. The prevalence of cervical thyroid was 91.1% and the prevalence of retrosternal thyroid was about 8.9%. The prevalence rates of malignancy in cervical and retrosternal thyroid were 34.7% and 21.4%, respectively.

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Authors' Contributions

Seyyed Reza Modarres and Ali Naghshineh performed the surgery. Sekineh Kamali, Neda Amani and Farham Moslemi collected the data. Hedyeh Sadat Hadian wrote the manuscript and the other authors revised it.

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