ORIGINAL ARTICLE

The Prevalence and Progression of Different Thyroid Tumors among Patients Referred to Shahid Sadughi Hospital: 9 Years Follow-Up Study

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Received: 27 April 2017

Accepted: 02 August 2017

Published in October 2017

Abstract

Objective: The study evaluated the prevalence and progression of different thyroid tumors in patients who referred to Shahid Sadoughi Hospital during 2005 to 2013, Yazd, Iran.

Materials and Methods: In this retrospective follow-up study, cytopathological data of patients suffering from thyroid masses was collected during 2005-2013. Age and sex of patients were recorded.

Results: Totally, 2055 patients were evaluated in this study. The patients were between 21-50 years old .Among the patients, pathological types identified were as follow: 86.8% goiter, 5.8% inflammatory lesions, 3.2% follicular lesions, 3.5%papillary carcinoma and 0.8% follicular neoplasm. Among 2055 patients, 91.7% were women and 8% were men. The frequency of thyroid nodules was increased from 2003 to 2013 with steep slope.

Conclusion: In total, regarding the current study, different kinds of thyroid tumors had growing trends in recent years and new plan and strategies are recommended to deal with this problem.

Keywords: Thyroid tumors, Follicular neoplasm, Papillary thyroid carcinoma, Goiter, Inflammatory lesions

Introduction

Thyroid tumors classified as goiter, epithelial tumors, and follicular lesion. Epithelial tumors are divided into benign and malignant types (1). Malignant type includes papillary thyroid carcinoma (PTC), follicular thyroid carcinoma (FTC), medullary thyroid carcinoma (MTC), Hürthle cell carcinoma and lymphoma. Follicular adenomas is categorized as benign epithelial tumor (2-5).Thyroid nodules are frequent (4 -8 %) in physical examination or various imaging procedures such as thyroid ultrasonography (US) (1). The initial evaluation should always include a history and physical examination focusing on malignancy. The prevalence of thyroid nodules increases with age. The possibility of malignancy of thyroid nodules are associated with different risk factors. Patients under 20 years of age and those aged 60 or over are more susceptible for malignant nodules (6,7). One percent of all new cancer diagnoses belongs to thyroid cancer in worldwide. This cancer is more common in women in comparison with men (8-12). We

decided to perform this study because of high incidence of thyroid nodules and the ascending trend of thyroid malignancies during recent decades and the importance of separating whether this ascending trend is due to increased cytology sampling rate or due to risk factors which are associated with head and neck cancer. The main aim of this study was to evaluate the prevalence and progression of different thyroid tumors in patients who referred to Yazd Shahid Sadoughi Hospital during 2003 to 2013.

Materials and Methods

This is a retrospective, trend study. Data were collected from medical documentation of patients suffering from thyroid masses and underwent Fine Needle Aspiration (FNA) during 2003 to 2013. These data were collected from a single center (pathology department of Shahid Sadoughi hospital, Yazd, Iran) for facilitation of follow-up. The collected data were: age, sex, year of diagnosis, and type of tumor. For this study, only cytopathological data was selected and utilized.

Statistical analysis

All the data was analyzed using SPSS software, version 20.0. *P*-value<0.05 was considered to indicate a statistically significant difference.

Results

Totally, 2055 patients were evaluated in this study. Among 2055 participants, 170 patients (8.3%) were male and 1885 patients (91.7 %) were female. Twenty six of patients were younger than 20 years old (1.3 %), 1411 aged between 21 to 50 years (68.7%), and 618 aged > 51 years (30.1%). With respect to ANOVA test, no significant difference was found in terms of mean age from 2005 to 2013 (*P*-Value =0.358) (Figure 1). The type of lesion was indicated in Table 1. As shown in this table, Type of pathology was goiter in 1783 patients (86.8%), Inflammatory lesions in 119 patients (5.8%) , follicular lesion in 65 patients (3.2%), papillary carcinoma in 71 patients (3.5%) , and follicular neoplasm in 17 patients (0.8%). The mean age of patients suffered from goiter was 44.41±12.72 years and the patients ware in the age range of 19-90 years. The lowest mean age was observed in patients with inflammatory lesion; whereas, the highest mean age was found in patients with follicular neoplasm. According to ANOVA test, no significant difference was found in terms of mean age among patients with different kinds of thyroid nodules (*P*-Value=0.377). The age range of male patients was 11-82 years and their mean age was 45.65±13.31 years; whereas, female patients were in the age range of 16-90 years and their mean age was 44.15-12.80 years. According to T-test, no significant difference was observed in terms of mean age between male and female patients (*P*-Value=0.143). Frequency distribution of tumor pathology type in terms of gender was summarized in Table 2. Inflammatory lesions was the most frequent as compared to other

Table 1. Frequency distribution of type of lesion

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Goiter	1783	86.8	86.8	86.8
Inflammatory lesions	119	5.8	5.8	92.6
Follicular lesion	65	3.2	3.2	95.7
Papillary carcinoma	71	3.5	3.5	99.2
Follicular neoplasm	17	.8	.8	100.0
Total	2055	100.0	100.0	

Table 2. Frequency distribution of tumor pathology type in terms of gender

Variable		Zayehcod					Total
		Goiter	Inflammatory lesions	Follicular lesion	Papillary carcinoma	Follicular neoplasm	
Gender	**Male**	146	10	6	5	3	170
	Female	1637	109	59	66	14	1885
Total		1783	119	65	71	17	2055

types during years of 2005 and 2006. However, its incidence was reduced from 2005 to 2006. During 2006, the most frequent types were follicular lesion and papillary carcinoma, respectively; whereas, the incidence of these diseases was also reduced from 2007 to 2008. Goiter allocated the highest frequency to itself from 2008-2013 while its incidence had ascending trend (Figure 2). The most frequent disease types according to age group were as follows: out of 2055 patients,1226 patients with goiter who aged between 21-50, 538 patients who aged >51 years, and 80 patients who aged between 21-50 years suffered from inflammatory lesions (Table 3). The rate of the disease was not changed notably among male patients as compared to female during the study and it had a steady trend in a way that the lowest frequency was 2 and the highest frequency was 52. Whereas, the incidence of the disease had ascending trend among female patients and the lowest and highest frequencies were 39 and 621, respectively (Table 4).

Conclusions

According to the National Cancer Institute, Thyroid cancer is the most common malignancy of the endocrine system (1-3). Although diagnosis of thyroid cancer or any other cancer is difficult due to special circumstances, the vast majority of thyroid cancers are treatable with surgery and other treatments (4-6). The Cancer Society has projected 62,450 new cases of thyroid cancer for 2016 and more than 1980 associated deaths including 1070 women and 910 men (7-16). The prevalence of thyroid cancer has been evaluated in different countries in the form of retrospective studies (17). The outcome disease has been assessed in different time intervals of 5, 10, and 15 years and in different regions by various studies (18-21). Given the importance of this issue, the prevalence and progression of different thyroid tumors in patients who referred to Shahid Sadoughi Hospital during 2005 to 2013 were examined and analyzed in this study using the patients' records in order to render a generalization about the prevalence and the treatment process of this disease. The results of the current study revealed higher incidence of thyroid tumors in women than men (91.73% for women vs. 8.27% for males). These results were consistent with results of other related studies. Researchers have shown that females are more likely to have different thyroid tumor at a ratio of 3:1 (22,23). It is not worthy to mention that the increase in the rate of thyroid cancer is due to growing increase of papillary cancer while the overall rate of other thyroid tumors is relatively stable (23,24). Thyroid cancer can happen in any age group, although it is most prevalent after age 30 and its aggressiveness grows significantly in older patients that is in line with the findings of the current study. The results of the current investigation demonstrated that 26 patients (1.3%) were younger than 20 years, 1411 patients (68.7%)

Table 3. Frequency distribution of tumor pathology type regarding age groups

Variable		Age group			Total
		< 20 years	21 to 50 years	>50 years	
Zayehcod	Goiter	19	1226	538	1783
	Inflammatory lesions	7	80	32	119
	Follicular lesion	0	47	18	65
	Papillary carcinoma	0	47	24	71
	Follicular neoplasm	0	11	6	17
Total		26	1411	618	2055

Table 4. Frequency distribution of gender based on year of diagnosis in the study population

Variable		year									Total
		84	85	86	87	88	89	90	91	92	
Gender	Male	2	9	12	11	10	12	30	32	52	170
	Female	39	76	154	121	136	175	262	301	621	1885
Total		41	85	166	132	146	187	292	333	673	2055

were in the age group of 21 to 50 years old, and 618 patients (30.1%) were older than 51 years. Thyroid tumors distribution had been observed in all age groups and the highest incidence was seen in middle-aged people. Luc G. Morris et al., showed that the incidence and progression of thyroid tumors is higher and faster in middle age. As it was mentioned earlier, our study also reported high incidence of thyroid tumors among middle-aged people (mean age of 44 years). Explanations for the worldwide increasing incidence of thyroid Cancer are controversial. the rate of thyroid cancer incidence has been increasing rapidly for unclear reasons and some researchers believe that this increase in frequency is due to increase of detection conditions and advances in related techniques (25,26). Other researchers believe that the actual increase of these thyroid tumors are possibly because of a change in life style and in the environment (27,28). In a retrospective study by G.T. MORRIS et al (2013), it was concluded that the incidence of thyroid malignancies has a rising trend and this increased incidence of thyroid cancer is most likely because of more sensitive diagnostic procedures as a result of increase in cytological sampling (29). The increased incidence was also found in our study in a way that the growing prevalence of thyroid tumors was observed from 2005 (2%) to 2013 (32.75) which is in line with the findings of the study conducted by Amy Y chen et al. In this retrospective study, the data of patients with thyroid malignancies were collected from 1988 to 2003. They concluded that all differentiated thyroid tumors had rising trend at all stages and sizes (30,31). Both hypothetical factors in this study can justify the growing trend of thyroid tumors observed in our study. Considering that the Shahid Sadoughi university of medical sciences is one of the best known and largest center in the Southeast of Iran, it is likely that the observed rising trend in the incidence of thyroid tumors from 2005 up to 2013 was caused because of huge number of patients who referred to this center from different parts of Iran and consequently the increased number of samplings. In the present study, the trend of

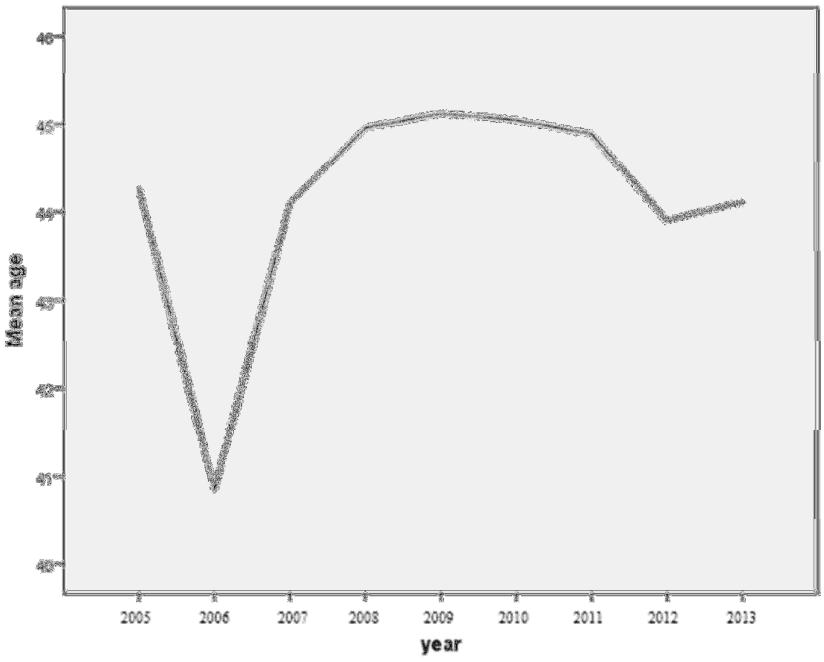

Figure 1. Mean age of patients with different kinds of thyroid nodules according to year of diagnosis

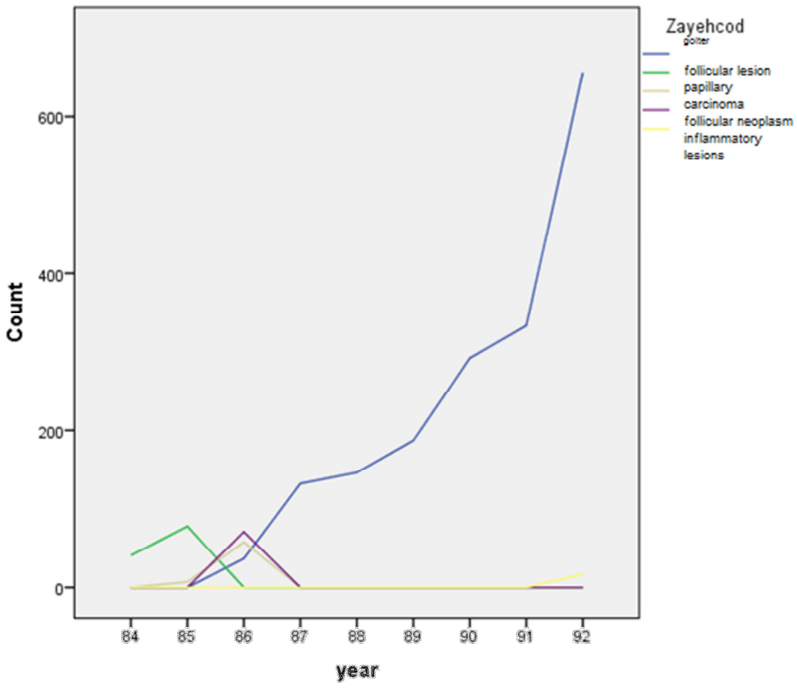

Figure 2. Changes in the incidence rate of thyroid tumors during the study period

changes in the mean age of patients with thyroid cancers was also evaluated. Based on the results, the average age was in the range of middle-aged people throughout all studied years. The minimum mean age was found in 2006 and the maximum mean age was observed in 2009 No statistically significant difference was observed regarding mean age of patients and in all conditions the incidence of these diseases are higher in middle-aged people. According to the Figure presenting the mean age of patients with thyroid tumors regarding the year of diagnosis, a drop of four years was found in mean age during 2005. In other studied years, there was a relatively stable trend and the prevalence of the disease across mean age was steadly and no significant difference was found regarding mean age during different years (*P*-value=0.358). In addition, the mean age of patients was examined in terms of tumor type. The lowest mean age was for patients with inflammatory lesion and the highest mean age was found among patients with follicular neoplasm. Regarding mean age, no significant difference was found among patients diagnosed with different thyroid cancers (*P*-value=0.377). Various studies have also shown that the prevalence of thyroid tumors was higher in adults (23,32).The mean age of male was higher than female but no statistically significant difference was found (*P*-value=0.143). Inflammatory lesions were the most frequent as compared to other types during years of 2005 and 2006. However, its incidence was reduced from 2006 to 2007. During 2007, the most frequent types were follicular lesion and inflammatory lesions, respectively; whereas, the incidence of these disease was also reduced from 2007 up to 2008. Goiter allocated the highest frequency to itself from 2008-2013 while its incidence had descending trend. Goiter allocated the highest frequency to itself from 2008-2013 while its incidence had ascending trend. These findings unraveled this fact that the prevalence of goiter had regular smooth ascending growth in contrast to other types which had

unpredictable and unregularly trend. Several studies prove the increase of thyroid tumors prevalence in different regions and present different reasons for this increased incidence (23,24, and 33). The current investigation in line with other related studies supported the increasing incidence of thyroid tumors in a ten years interval.

Conclusion

Regarding the current study, different kinds of thyroid tumors had growing trends in recent years and new plan and strategies are recommended to deal with this problem. It seems that high incidence and growing trend of thyroid tumors in Yazd is possibly due to this fact that this city becomes one of the major medical center in southeast of Iran in recent years and number of patients who referred to this hospital from different cities is increased.

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