



The Clinicopathological Features of Thyroid Cancer in Adiwaniyah Province in Iraq

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Abstract:

Background: Neoplasms of thyroid tissue can benign and localized to thyroid gland or can metastasize to other regions of the body by either hematogenous or lymphatic routes. Based on morphological, clinical, and genetic characteristics, thyroid tumors are currently broadly categorized as follicle-derived (thyroid epithelial) neoplasms, other epithelial tumours, non-epithelial tumours, and secondary tumours.

Aim of the study: The current study was aiming at shedding light on the principal histopathological thyroid neoplasms and their associated clinicopathological features seen in Adiwaniyah province in Iraq.

Material and methods: The current cross sectional study was carried out in the central laboratories of Adiwaniyah Teaching Hospital, Adiwaniyah Province, Iraq. The study was based in retrieving the histopathological reports of patients with thyroid disease admitted to the hospital during the period extending from January 2020 till January 2023. The reports were reviewed for diagnosis, gross morphological description, microscopical description and results of immunohistochemistry. Data about type of thyroid lesions and their associated microscopical features were reported and then these data were transformed into a spread sheet of Microsoft Office Excel 2010.

Results: With respect to the size of neoplastic nodules, the mean size of all cases was 3.27 ± 1.99 cm, and there was no significant difference in mean size of tumor between male patients and female patients, 3.58 ± 2.00 cm versus 3.24 ± 1.99 cm, respectively ($p = 0.609$). Lymphovascular invasion was seen in 4 cases (4 %) and there was no significant difference in its rate between males and females ($p = 0.343$). Capsular invasion was seen in 13 cases (13 %) and there was no significant difference in its rate between males and females ($p = 0.615$). The vast majority were Papillary thyroid micro-carcinoma (98 %) and there were 2 cases of poorly differentiated thyroid carcinoma and there was no significant difference in rate of these tumors between males and females ($p = 0.191$).

Conclusion: Thyroid cancer is most commonly seen in women within the fifth decade of life and the most common type is papillary carcinoma. Size of thyroid nodules is not correlated to its malignant potential.

Key words: Thyroid cancer, Adiwaniyah, Iraq

Introduction

The thyroid gland is one of the major endocrine glands and is concerned with synthesis and secretion of a number of hormones enrolled in regulation of metabolic processes in the body (1). The gland itself is under control of pituitary gland by way of thyroid stimulating hormone and further regulated by hypothalamus by the way of thyroid releasing hormone mediated by its effect on anterior pituitary gland (2).

The thyroid gland is a target for number of disorders that can be congenital or acquired (3). Acquired disorders of the thyroid gland can be inflammatory in origin; however, a significant proportion of these disorders is neoplastic in origin (4). Neoplasms of thyroid tissue can be benign and localized to thyroid gland or can metastasize to other regions of the body by either hematogenous or lymphatic routes (5). Based on morphological, clinical, and genetic characteristics, thyroid tumors are currently broadly categorized as follicle-derived (thyroid epithelial) neoplasms, other epithelial tumours, non-epithelial tumours, and secondary tumours (6). The biological behavior of these tumors within the body determines whether they are benign, borderline, or malignant (7). Malignant neoplastic disorders of thyroid gland are grouped into several well distinct histopathological forms including papillary carcinoma, follicular carcinoma, medullary carcinoma, anaplastic carcinoma and other rare forms (5).

Approximately 80% of thyroid cancer patients are papillary carcinomas (8). Additionally, it is the thyroid cancer subtype that is most common in nations with an adequate or excessive intake of iodine (9). It is occurring more frequently (10). The causes are unknown, but they might be due to advancements that help in early cancer identification (11). Although it can develop at any age, congenital tumors have very occasionally been identified (12). With a mean age of 40 years, it is typically discovered in individuals between their third and fifth decades of life. Women are affected by PTC in ratios of 2:1 to 4:1 more commonly than men and the prevalence rises with age (13). There is a lot of curiosity in the etiology. An earlier history of radiation exposure is the only prominent or well-established environmental risk associated with tumor progression (14). Other potential risk factors are having a family history of PTC or having an underlying benign thyroid condition (15).

Low iodine diet is a risk factor for follicular thyroid carcinomas, which make up 6–10% of thyroid cancers. Minimally invasive follicular carcinoma, encapsulated angioinvasive carcinoma, and widely invasive follicular carcinoma are the three subtypes of FTC that can be classified by the World Health Organization (WHO) as of 2017 (16). The majority of DTC patients are characterized by a favorable prognosis despite having a variety of biological characteristics, as shown by 10-year survival rates of about 90% (20). As evidenced by 2-year survival rates of just approximately 10–15%, anaplastic thyroid carcinomas (ATCs), which are aggressive and rapidly lethal in nature, often have a poor prognosis. Three to five percent of thyroid carcinomas are poorly differentiated (17, 18), and the fluctuation in frequency is frequently attributed to environmental variables and variations in histological interpretation (19).

The current study was aiming at shedding light on the principal histopathological thyroid neoplasms and their associated clinicopathological features seen in Adiwaniyah province in Iraq.

Materials and methods

The current cross sectional study was carried out in the central laboratories of Adiwaniyah Teaching Hospital, Adiwaniyah Province, Iraq. The study was based in retrieving the histopathological reports of patients with thyroid disease admitted to the hospital during the period extending from January 2020 till January 2023. The reports were reviewed for diagnosis, gross morphological description, microscopical description and results of immunohistochemistry. Data

about type of thyroid lesions and their associated microscopical features were reported and then these data were transformed into a spread sheet of Microsoft Office Excel 2010.

Reported of thyroid cancer were isolated and the following data were obtained: age of patients, gender, number of lobes involved, lymphovascular invasion, capsular invasion, background non-neoplastic lesions and diagnosis. There was no need for patients' consent because the study was retrospective; however, ethical approval was issued by the ethical committee of the health directorate. Statistical description was based on reporting number, percentages, mean, range and standard deviation.

Results

The characteristics of patients with thyroid neoplasms classified according to gender are shown in table 1. The range of age of enrolled patients was between 19 and 77 years and the mean age was 43.64 ± 13.94 years. The study included 10 males and 90 females making a male to female ratio of 1: 9. The mean age of men was higher than that of women, 47.50 ± 18.95 years versus 43.21 ± 13.34 years, respectively, but this difference was statistically not significant ($p = 0.359$).

With respect to the size of neoplastic nodules, the mean size of all cases was 3.27 ± 1.99 cm, and there was no significant difference in mean size of tumor between male patients and female patients, 3.58 ± 2.00 cm versus 3.24 ± 1.99 cm, respectively ($p = 0.609$). In all cases the range of nodule size was between 0.4 cm and 12 cm. In most of the cases two lobes were involved accounting for 91 %; however, single lobe involvement was seen in 9 % of cases. There was no significant difference in the number of lobes involved between men and women ($p = 0.593$).

Lymphovascular invasion was seen in 4 cases (4 %) and there was no significant difference in its rate between males and females ($p = 0.343$). Capsular invasion was seen in 13 cases (13 %) and there was no significant difference in its rate between males and females ($p = 0.615$).

Histopathological types of thyroid neoplasms reported in this study are demonstrated in table 2. The vast majority were Papillary thyroid micro-carcinoma (98 %) and there were 2 cases of poorly differentiated thyroid carcinoma and there was no significant difference in rate of these tumors between males and females ($p = 0.191$).

Table 1: Characteristics of patients with thyroid neoplasms classified according to gender

Characteristic	Total <i>n</i> = 100	Male <i>n</i> = 10	Female <i>n</i> = 90	<i>p</i>
Age (years)				
Mean \pm SD	43.64 ± 13.94	47.50 ± 18.95	43.21 ± 13.34	0.359 I
Range	19 -77	23 -77	19 -75	NS
Size of nodules (cm)				
Mean \pm SD	3.27 ± 1.99	3.58 ± 2.00	3.24 ± 1.99	0.609 I
Range	0.4 -12	0.8 -8	0.4 -12	NS
Number of lobes involved				
One, <i>n</i> (%)	9 (9.0 %)	0 (0.0 %)	9 (10.0 %)	0.593 F
Two, <i>n</i> (%)	91 (91.0 %)	10 (100.0 %)	81 (90.0 %)	NS
Lymphovascular invasion				
Positive, <i>n</i> (%)	4 (4.0 %)	1 (10.0 %)	3 (3.3 %)	0.343 F
Negative, <i>n</i> (%)	96 (96.0 %)	9 (90.0 %)	87 (96.7 %)	NS

Capsular invasion

Positive, <i>n</i> (%)	13 (13.0 %)	2 (20.0 %)	11 (12.2 %)	0.615 F
Negative, <i>n</i> (%)	87 (87.0 %)	8 (80.0 %)	79 (87.8 %)	NS

n: number of cases; **SD**: standard deviation; **I**: independent samples *t*-test; **F**: Fischer exact test; **NS**: not significant

Table 2: Histopathological types of thyroid neoplasms reported in this study

Diagnosis	Total <i>n</i> = 100	Male <i>n</i> = 10	Female <i>n</i> = 90	<i>p</i>
Papillary Thyroid Micro-carcinoma	98 (98.0 %)	9 (90.0 %)	89 (98.9 %)	0.191 F
Poorly differentiated thyroid carcinoma	2 (2.0 %)	1 (10.0 %)	1 (1.1 %)	NS

n: number of cases; **F**: Fischer exact test; **NS**: not significant

Discussion

The neoplastic lesions affecting the thyroid gland are among the common clinical problems seen every in surgical and medical wards. Here in Adiwaniyah province in Iraq, little is known about the clinicopathological characteristics of neoplastic lesions targeting the thyroid gland. In this study, we observed that 90 % of cases were females and the male to female ratio was 1:9 and most of cases were of papillary histological configuration.

Women have always been more likely to develop thyroid cancer than men, but as incidence has risen globally in recent years, the discrepancies have grown much more pronounced. Investigations into the biological causes of gender-specific variations in thyroid cancer have not yet yielded any solid results (21).

In our study, the mean age of men was 47.50 ±18.95 years and that of women 43.21 ±13.34 years. According to previous reports, the mean age at diagnosis was 45.6 years (mean age at diagnosis was 48.5±17.9 years for males and 44.8±15.3 years for females); indeed, these figure are very close to our findings (22).

Based on our observation, the range of nodule size was between 0.4 cm and 12 cm. In most of the cases two lobes were involved accounting for 91 %; however, single lobe involvement was seen in 9 % of cases. These findings suggest that size of tumor may not correlate well with clinical behavior, therefore, nodules of any size in the thyroid gland should be taken seriously and properly evaluated for malignant potential. It has been stated that the number of nodules and their size are not predictive of malignancy, as a nodule smaller than 1 cm is as likely as a larger nodule to harbor neoplastic cells in the presence of suspicious ultrasound features (23, 24). Choosing an arbitrary size as cutoff for the likelihood of cancer or stratifying the risk in a multinodular goiter based on the “dominant” nodule has fallen into disfavor (25). In our study, papillary carcinoma was contributing to the vast majority of cases and this finding is in line with several previous reports (26, 27).

Regardless of race or region, well differentiated thyroid carcinoma (WDTC) is the most prevalent endocrine cancer. Over the past three decades, WDTC has become more prevalent in the majority of regions of the world. Many medical professionals think that this increase is primarily attributable to increased detection, which may have been brought on by the widespread use of medical imaging techniques like thyroid ultrasonography, the rise in thyroid surgeries that reveal occult cancers, or the more thorough examination of surgical specimens obtained by thyroid surgeries, among other things (27).

Conclusion

Thyroid cancer is most commonly seen in women within the fifth decade of life and the most common type is papillary carcinoma. Size of thyroid nodules is not correlated to its malignant potential.

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