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Morphological Pattern and Frequency of Thyroid Tumors

Pages with reference to book, From 131 To 133

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Abstract

Objective: The present study was done to evaluate the frequency of thyroid cancer and to find out the prevalence of histological types of thyroid tumor with respect to age and sex group.

Setting: This study included consecutive cases of malignant tumors of thyroid gland, which were diagnosed in the Department of Pathology at the Aga Khan University Hospital, Karachi during the period of three years (1995-1997).

Methods: These cases were evaluated on H & E stained sections from paraffin embedded 10% buffered formalin fixed tissue blocks. Special stains and immunohistochemical analysis were performed whenever required. Results: A total of 8541 malignant tumors were diagnosed in a period of 3 years which included 103 (1.2%) cases of thyroid cancer. Thyroid tumors were more prevalent in females with female to male ratio of 2.6:1. Papillary carcinoma (69%) was the most common histological type of thyroid tumors, followed by follicular carcinoma (11.6%), medullary carcinoma (9.7%), anaplastic carcinoma (5.9%), non-Hodgkin's lymphoma (2.9%) and unclassified tumors (0.9%) in order of frequency.

Conclusion: Thyroid cancer was more common in females. Papillary carcinoma was the most common histological type of thyroid tumors in females as well as in males. Papillary carcinoma was more prevalent in third, fourth and fifth decades of life while follicular and anaplastic carcinomas were more frequent after the fourth decade of life (JPMA 49:131, 1999).

Introduction

Thyroid cancer is relatively, infrequent and it comprises a heterogeneous group of malignant tumors, which exhibit difference not only in biological behavior but in prognosis as well¹⁻³. Follicular carcinoma tends to metastasize to lungs and bones while papillary carcinoma usually spreads to lymph nodes. Cervical lymph node metastases are present in 15% -50% cases of papillary carcinomas at the time of diagnosis³⁻⁵. Prognosis of papillary carcinoma is exceptionally good with 90% survival at 20 years³. In cases of papillary carcinoma of the thyroid, the age also has a prognostic significance³. Marked variation in the prevalence of thyroid tumors has been observed in the different regions of the world^{1,2,6-11}. The knowledge of geographical distribution of cancer is vital for the formation of epidemiological hypothesis, which helps to determine the etiology and the pathogenesis of disease. Thyroid cancer is more prevalent in females as compared to males and it is more common in the third, fourth and fifth decade of life⁶. Variation in the frequency of histological types of thyroid tumors has been observed in various parts of the world. In iodine rich areas, higher frequency of papillary carcinoma of the thyroid gland was encountered¹².

The objective of the present study is to evaluate the frequency of thyroid cancer and to find out the prevalence of histological types of thyroid tumor with respect to age and sex group.

Materials and Method

The present study included consecutive cases of malignant tumors of thyroid gland, which were

diagnosed in the department of pathology at the Aga Khan University Hospital, Karachi during the period of three years (1995-1997).

The specimens were evaluated on Haematoxylin and Eosin stained sections from paraffin embedded 10% buffered formalin fixed tissue blocks. Special stains like reticulin and congo red were performed whenever required.

Immunohistochemical staining with leukocyte common antigen (LCA), thyroglobulin, cytokeratins and vimentin was performed by using peroxidaseable. Histological types of thyroid cancer.

Antiperoxidase (PAP) technique whenever indicated. The relevant clinical data as age and sex was also noted.

Results

A total of 8541 malignant tumors were diagnosed in the department of pathology at the Aga Khan University Hospital Karachi during the period of three years (1995-1997) and it included 103 (1.2%) cases of thyroid cancer.

Papillary carcinoma (69%) was the most common thyroid tumor followed by follicular carcinoma (11.6%), medullary carcinoma (9.7%), anaplastic carcinoma (5.9%), non-Hodgkin's lymphoma and unclassified tumors 2.9% and 0.9% respectively in order of frequency (Table).

Table. Histological types of thyroid cancer.

Histological type	No. of cases	%
Papillary carcinoma	71	69
Follicular carcinoma	12	11.6
Medullary carcinoma	10	9.7
Anaplastic carcinoma	6	5.9
Non-Hodgkin's lymphoma	3	2.9
Unclassified malignant tumor	1	0.9
Total	103	100

Thyroid tumors were more prevalent in females with male to female ratio of 1:2.6. In papillary carcinoma, the age ranged from 12 to 71 years with mean and median of 36.8 years and 35 years respectively. The age varied from 9 to 60 years in the cases of follicular carcinoma and the mean was 39.8 years with median of 47 years. Most of anaplastic carcinomas (80%) occurred in elderly above the age of sixty years while all three cases of non-Hodgkin's lymphoma were diagnosed in females.

Discussion

Environmental, genetic and racial factors influence the geographical distribution of cancer¹³. For the determination of predisposing factors of disease, the epidemiological observations play an important

role and this information helps in the formation of hypothesis about the etiology and pathogenesis of the disease.

In the present study, a general overview of the thyroid cancer is presented, where in a period of three years (1995-1997), a total of 103 cases of thyroid malignant tumors were diagnosed. These constituted 1.2% of the all malignant tumors diagnosed in the department of histopathology. The frequency of thyroid cancer, observed in our series was in accordance with the study published by Memon et al in which the thyroid cancer was 1.01%². In another series reported by Ahmed et al, thyroid cancer comprised 1.62% of all tumors in males and 2.21% in females³.

The prevalence rate of thyroid cancer is high in the region of Middle East. In a series published from Saudi Arabia, the frequency of thyroid cancer was 4.4%⁶. Another series reported from UAE revealed that thyroid tumors constituted 4.9% of all diagnosed malignant tumors¹⁴.

Thyroid cancer is more common in females. In our study the male to female ratio was 1:2.6 which is in accordance with the figure of (M: F) 1:2.5 reported from USA¹⁵. A series by Ahmed et al revealed a comparatively low male to female ratio of 1.01:1.081. Other series from different parts of the world also exhibited a similar pattern. with thyroid cancer being more prevalent (62%-81%) in females as compared to males^{6,11-16}. A series from Saudi Arabia revealed that after breast carcinoma, thyroid cancer was the most common malignant tumor in females⁶. It was third most common in a series from UAE¹⁴. In Filipino women, thyroid tumors were the 4th most common malignant neoplasms¹⁶. The highest female to male ratio of 9:1 to 13:1 has been reported in the series published from Japan^{17,18}. In the present study, papillary carcinoma was the most frequent histological type of thyroid tumors in males and females. It comprised 69% of all malignant thyroid tumors. In USA, papillary carcinoma comprised 90% of thyroid cancer^{19,20}. From Saudi Arabia, Ahmed et al reported that, 80% of the thyroid tumors belonged to the category of papillary carcinoma in their series⁶. Papillary carcinoma constituted 60% of all malignant thyroid tumors in a series from Rawalpindi reported by Khan et al²¹. In our series, the highest prevalence of papillary carcinoma was observed in 3rd, 4th and 5th decade of life. A similar observation was made by Ahmed et al⁶.

In the present study, follicular carcinoma comprised 11.6% of thyroid tumors and it was more frequently encountered in adults with age more than 40 years. A relatively higher frequency (24%) of follicular carcinoma has been reported by Khan et al from Rawalpindi which is a referral center for northern areas of Pakistan²¹. Medullary carcinoma was more prevalent in females below the age of 40 years while it was more frequent in males above the age of 40 years. All three cases of non-Hodgkin's lymphoma were seen in females. Ahmed et al reported that non-Hodgkin's lymphoma was more common in females with female to male ratio of 4.8:16.

This geographic variation in the prevalence rate of thyroid cancer could be attributed to the iodine content in food. An increase in the relative frequency of papillary carcinoma has been observed in the last two decades in a series published from Saudi Arabia⁶. Change in the dietary habits along with diets with high iodine content could be a possible cause⁶. It has been reported that after the introduction of iodine prophylaxis in various parts of the world, an increase in the relative frequency of papillary carcinoma over follicular carcinoma has been observed¹².

Statistical data about the disease not only provides clues to the cause but it also helps in the development of future plans regarding the control and prevention of the disease. It also draws attention towards the other important aspects for further research. Since this is a laboratory-based study, it has its own limitations. In this regard, further work up such as. population based study about the thyroid cancer and estimation of iodine content in water and food along with study of dietary habits in the community is suggested.

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