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Full Length Research Paper

A cross sectional study of 1198 cases of thyroid carcinomas in an academic referral center of Pakistan

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Thyroid cancer is the most common endocrine malignancy which constitutes 92% of all endocrine cancers. There is a lack of population based statistics on thyroid carcinomas in Pakistan but its relative frequency is increasing in our country. To address the need for epidemiological data on thyroid carcinoma in Pakistan, we have evaluated the frequency and types of thyroid carcinoma with respect to age and sex. In a cross-sectional study conducted at Jinnah Postgraduate Medical Center Karachi, We studied the thyroid nodules received in a period of five year, from Jan 2008 to Dec 2012. Pathology slides were studied to determine the morphological type and frequencies of malignant lesion of thyroid. Total of 1198 cases of nodular lesion of thyroid were studied, out of which 99 were malignant. Papillary carcinoma was found to be commonest with a frequency of 89.89% which is followed by follicular and medullary with the same percentage 4.04% and 2.02% hürthle cell carcinoma were found. We observed that the thyroid carcinoma was more prevalent in females 85.86% as compared to males 14.14% with a male to female ratio of 1:6. Thyroid carcinomas were more prevalent in 3rd and 4th decade of life and the mean age for female and male was 32.34 and 35.14 years respectively. Overall thyroid carcinomas are more frequent in females. Papillary carcinoma is the most common morphological type of thyroid carcinomas in both sexes. Thyroid carcinomas are more prevalent in 3rd and 4th decade of life.

Keywords: Thyroid carcinomas, Pakistan

INTRODUCTION

Thyroid cancer is the most common endocrine malignancy which constitutes 92% of all endocrine cancers (Merchant, 2012). Shaukat Khanum Cancer Registry Report – 2011 reported 3.18% of thyroid malignancies among females and ranked it as eighth most common malignancy (Annual Cancer Registry Report, 2011).

There is a lack of population based statistics on thyroid carcinomas in Pakistan but its relative frequency is increasing in our country (Khan, 1993) which according to might be due to increase in awareness of this disease and certain factors including genetic, dietary and environmental factors (Sarfraz et al., 2000). The well-known risk factors for Papillary Thyroid Carcinomas (PTC) include genetic factors, ionizing radiation, nodular disease of the thyroid (Al-Brahim and Asa, 2006) and nuclear fallout (Kondo et al., 2006). According to Bukhari et al. (2009) the dietary iodine is one of the causes of

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Table 1. Morphological distribution of malignant tumors of thyroid (n =99)

| Types of malignant lesions | Number of cases | Percentage (%) | CI 95 % |
|-----------------------------------|------------------------|-----------------------|----------------|
| Papillary Carcinoma | 89 | 89.89 | 82.7-94.7 |
| Follicular Carcinoma | 4 | 4.04 | 1.3-9.4 |
| Medullary Carcinoma | 4 | 4.04 | 1.3-9.4 |
| Hürthle Cell Carcinoma | 2 | 2.02 | 0.3-6.5 |
| Total | 99 | 100 | - |

Table 2. Frequency of different morphological variants of papillary carcinoma (n =89)

| Morphological Types of Papillary carcinoma of Thyroid | Number of cases | Percentage (%) | CI 95 % |
|--|------------------------|-----------------------|----------------|
| Classic papillary | 40 | 44.94 | 34.8-55.3 |
| FVPC | 42 | 47.20 | 36.9-57.5 |
| Micropapillary | 05 | 5.62 | 2.1-12.0 |
| FVPC with Hashimotos thyroiditis | 01 | 1.12 | 0.05-5.41 |
| Warthin like PTC | 01 | 1.12 | 0.05-5.41 |
| Total | 89 | 100 | - |

*CI = Confidence interval

thyroid cancer and accounts for variations in the frequency of thyroid cancer. After the introduction of iodine prophylaxis the frequency of papillary carcinoma is relatively increasing over follicular carcinoma in various parts of the world.

The data providing the information on the geographical distribution of cancer has a great importance in the sense that it helps in the establishment of causative factors and universal comparison. In attempt to deal with this, it is necessary that we try to find out the frequency and types of carcinomas received in a period of five year.

METHODS

This study was carried out in the department of Pathology, Basic Medical Sciences Institute, Jinnah Postgraduate Medical Center, Karachi; an effort has been made to determine the frequency and types of different nodular lesions of thyroid received in a total period of 5 years from January, 2008 till December, 2012.

Malignant cases were selected for in depth study for which special stains like Periodic acid Schiff (PAS), trichrome and Congo red were used for the differentiation among malignant cases.

RESULT

1198 nodular lesions of thyroid were analyze, 99 lesions were diagnosed as a malignant, out of which papillary carcinoma was found to be commonest with a frequency of 89 (89.89%) which is followed by follicular and medullary with the same percentage 4 (4.04%) and 2 (2.02%) hürthle cell carcinoma were found. Among the total number of 89 papillary carcinoma cases, 42 (47.20%) were FVPC, 40 (44.94%) were classic papillary, 5 (5.62%) were micro papillary, Follicular variant of Papillary Carcinoma (FVPC) with Hashimoto's thyroiditis and warthin like papillary were one (1) cases each and shares same percentage (1.12%). Out of 89 cases of papillary carcinoma 78 (87.64%) were in females and 11 (12.36%) were in males. While follicular carcinoma was with equal percentage 2 cases each in males and females (50%).

Whereas 1 (25%) case of medullary carcinoma was found in males and 3 (75%) cases were found in females. 02 cases (100%) of Hürthle cell carcinoma were found only in females. Maximum numbers of malignant lesions were found in 3rd and 4th decade of life.

Table 3. Age distribution of neoplastic lesions of thyroid (n =99)

| Types | Age groups (Years) | | | | | Mean Age | | Total |
|------------------|------------------------|-----------|-----------|-----------|-----------|------------------------------|-----------------------|-------|
| | < 20 | 21-30 | 31-40 | 41-50 | >50 | ±Std. Dev | ±SEM (Yrs) | |
| Malignant | Papillary Carcinoma | 17 | 33 | 20 | 13 | 6 | 31.84 ±12.19 ±1.29 | 89 |
| | Follicular Carcinoma | 0 | 0 | 0 | 3 | 1 | 50 ±7.07 ±3.53 | 4 |
| | Medullary Carcinoma | 0 | 1 | 3 | 0 | 0 | 33.5 ±8.54 ±4.27 | 4 |
| | Hürthle Cell Carcinoma | 0 | 0 | 2 | 0 | 0 | 36.5 ±4.94 ±3.50 | 2 |
| Total | 37 | 69 | 64 | 34 | 11 | 32.83 ±11.60 ±0.79 | 99 | |

SEM = Standard Error of Mean, Std. Dev= Standard Deviation

Table 4. Sex distribution of malignant thyroid lesions (n = 99)

| Morphological Types | Sex | | | | Male to Female Ratio | Total |
|------------------------|-----------------------|-------------------------------------|-----------------------|-------------------------------------|----------------------|-----------|
| | Male | | Female | | | |
| | No. (%) | Mean Age ±Std. Dev ±SEM (Yrs) | No. (%) | Mean Age ±Std. Dev ±SEM (Yrs) | | |
| Papillary carcinoma | 11 (12.36%) | 33.18 ±19.85 ±5.98 | 78 (87.64%) | 31.65 ±10.88 ±1.23 | 1:8 | 89 |
| Follicular carcinoma | 2 (50%) | 47.5 ±3.53 ±2.50 | 2 (50%) | 52.5 ±10.6 ±7.5 | 1:1 | 4 |
| Medullary carcinoma | 1 (25%) | 32 | 3 (75%) | 34 ±10.39 ±6.0 | 1:3 | 4 |
| Hürthle cell carcinoma | 0 | 0 | 2 (100%) | 36.5 ±4.94 ±3.5 | - | 2 |
| Total | 14 (14.14%) | 35.14 ±18.21 ±4.86 | 85 (85.86%) | 32.34 ±11.10 ±1.20 | 1:6 | 99 |

* SEM = Standard Error of Mean

* Std. Dev= Standard Deviation

DISCUSSION

In present study the most common malignant lesions were found to be papillary carcinoma 89.89%, followed by follicular carcinoma 4.04%, medullary carcinoma 4.04% and Hürthle cell carcinoma 2.02%. Hussain et al. (2005) reported almost similar sequence of papillary, follicular, medullary and Hürthle cell carcinomas with percentage of 77.89%, 12.63%, 4.21% and 2.11% respectively. Another study conducted by Merchant (2012) in Aga Khan University Hospital during 2009-2010, reported 80% cases of papillary, 11% of follicular carcinoma, 3.6% of medullary and 3.6% of Hürthle cell carcinoma. In present study papillary carcinomas showed high frequency (89.89%) which is in close approximation with Bukhari et al. (2009) reporting 90.2% for papillary carcinoma. Other studies such as Al-Jaradi et al. (2005) from Yemen and Tarrar et al. (2010) from Rawalpindi reported variable percentages 96.5% and 50% of papillary carcinoma respectively. In present study we

observed that the FVPC (47.20%) is observed to be the most common variant followed by (44.94%) classic type which is in accordance with DeLellis et al. (2004) stating that follicular variant of papillary thyroid carcinoma is the most common variant after the classic form of papillary carcinoma. However our observation for FVPC is closer to the percentage reported by Bukhari et al. (2009) 52.17% and higher than the percentage by Min et al. (2013) 14.2%. In this study we found 44.94% of classical variants which is similar with the percentage reported by Bukhari et al. (2009) 44.20%, while Min et al. (2013) reported higher percentage 76.9% for classic variant. In our study both FVPC with Hashimoto's thyroiditis and Warthin like PTC share the same percentage of 1.12%. Lin et al. (2011) quoted a previous study that reported the rate of co-existence of papillary carcinomas and Hashimoto's thyroiditis that ranged from 0.3% to 38%. This suggests that Hashimoto's thyroiditis might be a precancerous condition promoting PTC development (Repplinger et al., 2008). In this study the thyroid

carcinomas were more prevalent in 3rd and 4th decade of life similar to the findings reported by Merchant (2012) and Bukhari et al. (2009). In present study the mean age for female and male was 32.34 and 35.14 years respectively, which is in close approximation with Bukhari et al. (2009) who reported the mean age for female 32.6 years and for male 33.3 years.

We have observed that the thyroid carcinoma was more prevalent in females (85.86%) as compared to males (14.14%) with a male to female ratio of 1:6. Al-Jaradi et al. (2005) from Yemen reported a similar finding that thyroid carcinoma is more prevalent in female 86.6% than males 13.6% with a male female ratio of 1:6.7. This higher incidence in females is due to involvement of hormonal factors (Najum ul Haq et al., 2009 and Kondo et al., 2006)

CONCLUSION

It is concluded that overall thyroid carcinomas are more frequent in females. Papillary carcinoma is the most common morphological type of thyroid carcinomas in both sexes. Thyroid carcinomas are more prevalent in 3rd and 4th decade of life.

RECOMMENDATION

Proper intake of iodine rich diet may prevent follicular carcinoma of thyroid, on the other hand excessive iodine therapy should also be avoided as there is increased risk of developing papillary thyroid carcinoma with increase intake of iodine. Unnecessary exposure to radiation should also be avoided and further evaluation of other risk factors for thyroid carcinomas should be considered.

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