Original Article

Spectrum of Thyroid Gland Disorders in Karachi-DDRRL Experience

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ABSTRACT

Objective: To find out thespectrum of thyroid gland disorders in association with age and gender andto identify histological types of thyroid lesions.

Study Design: Descriptive Study.

Place and Duration of Study: This study was carried out at the Department of Histopathology, DOW University (OJHA campus) Karachi from1st Jan 2010 to 31st Dec 2011.

Materials and Methods: The record of total 208 specimens, were reviewed from the department of Histopathology, DOW University (OJHA campus) Karachi throughout the period from1st Jan 2010 to 31st Dec 2011. The specimens were received in 10% buffered formalin and processed as per routine laboratory procedure and then embedded in paraffin for block preparation. The sections were stained with the routine haematoxylin and eosin method and were studied and diagnosed by a consultant histopathologist. Difficult cases were discussed in Departmental Consultation Committee.

Results: Total 208 cases were studied, there was a female predominance 184 (88.5%) and among them majorities were in 3rd decade of life. Males were 24 (11.5%) commonly seen in 4th decade of life. The ages ranged from 15-75 years, mean age is 30 years.Nodular hyperplasia was the commonest thyroid lesion found.

Conclusion: The information in the present study may be considered as a baseline data of thyroid diseases inKarachi and a more elaborate prospective study carried out on a large scale in this country will contribute more to make the things clearer.

Key Words: Nodular hyperplasia, Follicular adenoma, Papillarycarcinoma, Hashimoto thyroiditis.

INTRODUCTION

The most common worldwide non-neoplastic lesion in thyroid is due to iodine deficiency, which is assessed to have emotional impact around three-quarters of a billion people[1]. The Diseases of thyroid gland are the second most common endocrine disorder, after diabetes around the globe[2]. The significance of thyroid disorders to oral pathology and oral and maxillofacial surgery lies in potential of carcinoma of thyroid to metastasize to mandible, maxilla and cervical chain of lymph nodes[3-7].

The incidence of thyroid cancer in USA is increasing approximately1 in 13 or 7.35%[8]. The prevalence of thyroid disease increases with age; it is 60% in 80-yr-old persons. The number of diagnosed small thyroid cancers andoccult thyroid cancer will be head to head, up to 36%[9]. Thyroid abnormalities are quite shared in senile individuals without known thyroid dysfunction; therefore thyroid screening is advisable for women over 50and at least every five years beginning at the age of 35 in adults[10].

In Pakistan Goiter is prevalent in the north-west areas. The prevalence of cancerous change in thyroid nodules is indefinite in our country due to lack of nationwide data and study[11]. The general incidence of non-neoplastic lesions and neoplastic lesions are89% and 11% respectively in Pakistan. Papillary carcinoma is the most common malignant thyroid lesion about 60% of all thyroid malignancies in Pakistan[12].

The most common etiology encountered in different countries of the world is an iodine deficiency and exposure to radiation hazards. Most of the reported thyroid nodules are either cystic or due to neoplastic change[13].

The thyroid gland is palpable in about 50% of women and 25% of men. The thyroid gland synthesizes and secretes two hormones: Thyroxine (T4), Tri-iodothyronine (T3)[2]. Both these hormones are under the control of thyroid stimulating hormone (TSH) of anterior pituitary gland which in turn is controlled by thyrotrophin releasing hormone (TRH) from hypothalamus[14]. The uniqueness of thyroid gland is the storage of thyroid hormone in an extracellular compartment. Two-Three months' supply of thyroid hormone is stored within the follicles, and this delays the onset of symptoms in deficiency diseases. Thyroid disease ranges from the production of too much or too little of the thyroid hormones, to the development of neoplastic lesion. The main groups of thyroid gland disease are hyperthyroidism (excess of thyroid hormone production), hypothyroidism (deficiency of thyroid hormone production), goiter formation, adenoma (benign growths) of the thyroid, and carcinoma of the thyroid[2].

The perseverance of this study was to observe the frequency and prevalence of various thyroid disorders in different age and sex groups in population of Karachi and to detect a number of histological types of thyroid lesions in specimens sent to the DOW laboratory for histopathology.

MATERIALS AND METHODS

In the present study, 208 thyroid specimens, from the department of Histopathology, DOW University (OJHA campus) Karachi during the period from Jan 2010 to Dec 2011 have been investigated. The specimens were received in 10% buffered formalin and processed as per routine laboratory procedure and then embedded in paraffin for block preparation. The sections were stained with the routine haematoxylin and eosin method and were studied and diagnosed by a consultant histopathologist. Difficult cases were discussed in Departmental Consultation Committee.

RESULTS

The data was evaluated to find out the frequency of various thyroid disorders and it was further separate out into sub-groups of age and sex to govern the prevalence of the disorders accordingly. The comparative frequencies and ratios were calculated for each group of disorders by entering the data in SPSS version 16. Frequency bar chart and tables were arranged using Microsoft excel software program.

Table No.1: Histological Types Of Lesions.

Histopathological Diagnosis	Number	%age
Nodular hyperplasia	**145**	**69.7**
Hashimoto thyroiditis	12	5.8
Lymphocytic thyroiditis	9	4.3
Chronic granulomatous inflammation	3	1.4
Follicular adenoma	19	9.1
Papillary carcinoma	14	6.7
Follicular carcinoma	3	1.4
Insular carcinoma of thyroid	1	0.5
Metastatic Well differentiated squamous cell carcinoma	2	1.0
Total	208	100.0

Among 208 cases studied, there was a female predominance 184 (88.5%) and majorities were in the 3rd decade of life. Males were 24 (11.5%) commonly in the 4th decade of life. The ages ranged from 15-75 years, mean age was 30 years as shown in figure 1. Nodular hyperplasia was the commonest thyroid lesion found in 145 cases, followed by follicular adenoma 20 cases, papillary carcinoma 14 cases, Hashimoto thyroiditis 12 cases, lymphocytic thyroiditis 9 cases, follicular carcinoma and chronic granulomatous inflammation 3 cases each, well differentiated squamous cell carcinoma in 2 cases and insular carcinoma of thyroid was found in a female of 55 years. Papillary carcinoma was the most common thyroid malignancy. The overall incidence of malignancy was 9.6%. as shown in table 1and figure 2. Ratio of hyperplasia to inflammation is 4.8:1, ratio of hyperplasia to benign tumor is 7.2:1%, ratio of hyperplasia to malignant tumors 7.2:1, ratio of inflammation to benign tumor is 1.5:1, ratio of inflammation to malignant tumor is 1.5:1, ratio of benign to malignant tumors 1:1, Female to male ratio in hyperplasia is 8.6:1, female to male ratio in inflammation is 29:1, female to male ratio in benign tumor is 19:1 and female to male ratio in malignant tumor is 1.8:1 as shown in table 2

Table No.2: Ratios in Thyroid Disorders

Ratio of Thyroid Disorders	No. of Subjects	Ratio
Ratio of hyperplasia to inflammation	145/30	4.8 : 1
Ratio of hyperplasia to benign tumors	145/20	7.2 : 1
Ratio of hyperplasia to malignant tumors	145/20	7.2 : 1
Ratio of inflammation to benign tumors	30/20	1.5 : 1
Ratio of inflammation to malignant tumors	30/20	1.5 : 1
Ratio of benign to malignant tumors	20/20	1 : 1
Female to male ratio in hyperplasia	130/15	8.6 : 1
Female to male ratio in inflammation	29/1	29 : 1
Female to male ratio in benign tumors	19/1	19 : 1
Female to male ratio in malignant tumors	13/7	1.8 : 1

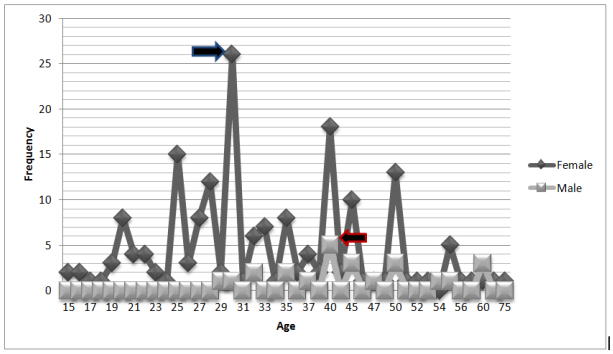

Figure No.1:Bar Chart showing Gender Distribution

DISCUSSION

Thyroid disorder is the commonest endocrine system malfunction[13]. The most common form of hyperthyroidism in aged females is Graves' disease (F: M, 8:1), while hypothyroidism effects 1/100

females and 1/500 males. It is very challengingto differentiate between benign and malignant lesions clinically[2]. In this study there was also female predominance 184 out of 208 cases and majority were in their 3rd decade of life. The rest were males in 4th decade of life. The ages ranged were 15 to 75 years.

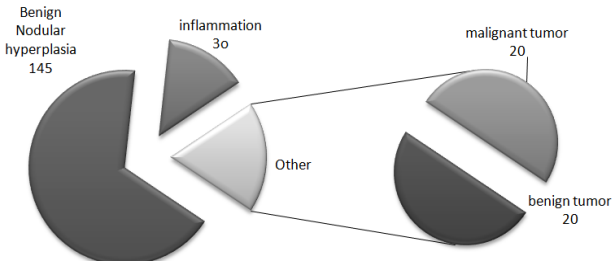

Figure No.2: **Pie Chart showing Spectrum of Thyroid Disorders**

The overall frequency of non-neoplastic lesions in this study was 69.7% as compared to 9.6% of neoplastic lesions. The commonest non neoplastic lesion in this study was nodular hyperplasia; which constituted 145 out of 208 of the thyroid specimens including diffuse(139) cases and multi-nodular goiters(6) cases. Mean age in females was 30 years (130/145) cases. This is constant with some native studies in which multinodular goiter and diffuse colloid goiters were found to be the commonest pathologies of the thyroid lesions[10-12]. The second common thyroid lesions were inflammatory 30 out of 208 cases. Among them 15 cases were of Hashimoto's thyroiditis, 8 cases of lymphocytic thyroiditis, 4 cases of chronic granulomatous inflammation, and 3 cases of follicular thyroiditis. Females were affected more (29 out of 30) cases. Follicular adenomas were seen in 20 cases (9.6%) of the specimens, female: male ratio is 19:1. There were 20 cases of malignant tumors of thyroid. In this study papillary carcinoma was the most common malignant thyroid lesion observed in about 6.7% (13 out of 20) lesions, followed by 4 cases of follicular carcinoma, 2 cases of well differentiated squamous cell carcinoma, and 1 case of insular carcinoma. However in distinction to Mofti et al; stating higher incidence of thyroid malignancies (29%) in a study of 158 patients[15]. In the present study the incidence of carcinoma thyroid in females were 13 cases out of 20. Female to male ratio was (1.8:1). Thyroid tumors are rare in children and they increases in frequency with the advancing age[12]. Even though patients of both gender and any age group may be affected, and individuals in the third to fifth decade of life[15]. In this study the age range of malignant thyroid lesions was second to sixth decade of life. The reason might be increased prevalence of thyroid disorders in certain areas of Pakistan. The overall incidence of malignancy in USA was 5.8%, in Libya 9.7% and in South Africa 5.4%[2, 11,14,15]. This study showed the malignant lesion of about 9.6% and these findings were similar to the finding of Libya resulted in 9.7% of malignant lesions. The studies from Riyadh stated an extremely high incidence of thyroid malignancy ranging from 21% to 29%as papillary carcinoma (66.6%), Follicular carcinoma (22%) and medullary carcinoma (4%) [13]. Other studies from different parts of the world also exhibited a similar pattern with thyroid carcinoma being more prevalent (62%-81%) in females.[11.16,18,20]Similarly in the present study, Colloid goiter is the most common benign lesion of the thyroid gland while papillary carcinoma is the most common malignant lesion of thyroid gland than the follicular carcinoma which is in agreement with the printed data.[2, 10.13,17,18,19,20]

CONCLUSION

The present study may be well thought-out as a baseline data of thyroid diseases inKarachi and a more elaborative and prospective study need to be carried out on a large scale nationwide willcontribute further to make the things clearer. Evaluation of thyroid status may help in early detection and possible treatment of thyroid diseases.

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