The Rate Of Differentiated Thyroid Carcinoma Among Patients With Goiter Referred To Diwaniya Teaching Hospital

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Abstract

Background :The thyroid cancer is the most frequent cancer of the endocrine system, and it is rapidly increasing in incidence. It occur more often in people who live in areas with excessive exposure to radiation and excessive use of x-ray which can be considered as an important risk factors .

Aim of study :Evaluation of the prevalence of thyroid cancer among patients with goiter that are referred to Al Diwanya teaching hospital and to evaluate the histological variants and the possible risk factors.

Patients and methods :We randomly select 74 patients (19 male ,55 female) with goiter (33 solitary nodule ,41 MNG),with ages of more than 5 years .We evaluate them by history ,examination and investigations , prospectively study them regarding the presence or absence of cancer ,and also the histological type of cancer (papillary or follicular). History includes the most important questionnaires (family history ,exposure to radiation especially x-ray), personal

history and all the details regarding their illness. Physical examination was done to every patient in form of general examination and examination of the thyroid gland. Also investigations were done for them in form of routine investigation and investigations of the thyroid . Ultrasound and fine needle aspiration (FNA) also were done .We followed the patients to obtain the results of histological examination .

Results :The collected data reveal that the most frequent ages presented with goiter are between 45-60 year ,female represented 74.3% of patients, with 55.4% of patients presented with MNG and 44.6% presented with solitary nodule. Family history of goiter was positive in 24.4% and negative in 75.6% of patients .History of x-ray exposure in childhood were positive in 59.4% and negative in 40.6% of patients. The statistical analysis of data after obtaining the histological results reveal that the papillary thyroid carcinoma represent 14.8% and the follicular thyroid carcinoma represent 6.7% of all patients with goiter. The thyroid cancer is most frequently present as solitary nodule as compared to MNG but there is no significant difference between solitary and MNG regarding the type of cancer. In our study the x-ray exposure was a significant risk factor for both types (papillary and follicular) of cancer (p- value is 0.02). Also the positive family history of thyroid cancer was another significant risk factor for both types of cancer (p-value is 0.01).

Conclusion : Thyroid cancer is not a rare tumor in our region .Better diagnostic tools should be used to reach the diagnosis . The positive family history and the history of x-ray exposure in childhood are important risk factors. We really need the activation of registration center of cancer to assess the problem in our country.

Introduction

The thyroid gland is an endocrine gland of a butterfly shape located in the lower front of the neck. The job of the thyroid is the synthesis of thyroid hormones which are responsible for the metabolism in the body.

The thyroid gland is not palpable normally. The term (goiter) is used to define generalized increase in size of it. The nodule is a discrete swelling in any site of gland.

Goiter is classified as :simple ,toxic (diffuse ,MNG ,or toxic adenoma) ,neoplastic ,and inflammatory ⁽¹⁾.Endemic goiter is the presence of goiter in more than 10 % of the population ⁽²⁾.Iraq is an endemic area with goiter ⁽³⁾. Thyroid cancer is the most common malignancy of endocrine system and it rises in the incidence. The increasing incidence is partially due to early asymptomatic small cancer⁽⁴⁾. Most of thyroid cancers show an detection of indolent phenotype and have a very good prognosis with survival rates of >95% at 20 years but the recurrence or persistence rate remain elevated ⁽⁵⁾. The incidence of thyroid cancer is about 3-4 times higher among women than men (6th cancer in women).It occurs at any age but it is rare in children. Most tumors are diagnosed during 3rd -6th decade of age⁽⁶⁾. The thyroid cancer in Iraq represents the 2nd cancer in women and the 8th cancer in men ⁽⁷⁾. Thyroid cancer is arise from either follicular or non-follicular cells. Follicular type includes papillary (PTC), follicular (FTC), differentiated poorly and undifferentiated(anaplastic) thyroid carcinoma (ATC). PTC and FTC are the most common types and both called differentiated thyroid cancer (DTC). Medullary thyroid carcinoma (MTC) arises from calcitonin-producing cells (C cells)⁽⁸⁾.The risk factors of thyroid cancer are:

1.Radiation :Which is the most important risk factor.⁽⁹⁾

2.TSH Levels and Iodine deficiency :Low level of Iodine causes an increase level of (TSH), a main growing factor for follicular cells of thyroid.⁽¹⁰⁾

3. Autoimmune Thyroid disease and thyroid nodularity.

4.Body weight and insulin resistance :There is a strong relation between obesity and the risk of cancer including thyroid cancer.⁽¹¹⁾

5.Environmental exposure :The most important factors are ionizing radiation and dietary iodine consumption .Others like Solvent occupational exposure like benzene and formaldehyde and others are all associated with thyroid cancer but the evidence of these still contradictory.⁽¹²⁾

6.Familial or genetic factors :Only about 5-10 % of thyroid cancers are familial and the vast majority are sporadic. ⁽¹³⁾

7.Female gender : The risk for thyroid cancer is 3-4 times more frequent in women.⁽¹⁴⁾

8.Cowden's syndrome and other rare syndromes.⁽¹⁵⁾

The Aims of Study :The aim of study is to assess the thyroid cancer prevalence among patients with goiter referred to Al Diwaniya teaching hospital and the evaluation of the possible risk factors that may lead to this condition.

Patients and methods

After we take a permission from ethics committee of Al Qadisiyah university of medical science, 74 Iraqi patients are involved in this study, at the duration from April,2018 to June,2018, in Al Diwanya teaching hospital which is the major referral hospital in our city.

Study design: Is prospective cross sectional study to determine the prevalence of thyroid cancer among patients with goiter referred to Diwanya Teaching hospital

Inclusion criteria : All patients admitted for surgery .

Important questionnaires used for data collection, including : Name , Age, Sex, duration of illness , family history of thyroid diseases, and the history of x-ray exposure. Physical examination including : Solitary nodule or MNG ,size of goiter ,consistency (firm, hard) and retrosternal extension. Laboratory investigation also done in form of : Routine laboratory investigation like :CBC, LFT,RFT (as a preparation for surgery). T3,T4 ,TSH .Other data collected after surgery(type of surgery and the results of histopathology)

A total of 74 patients with goiter was included in this study (19 male and 55 female), their ages are more than 5 years , with the most frequent ages are between 45-60 year. All patients were sent to Al Diwanya hospital lab for investigation, but the biopsies were sent to a private lab. Examination of goiter done for all patients which consist of inspection and palpation . Statistical analysis: Data has been collect and encompassed in a data grounded system and examined by statistical set of community knowledge ((SPSS, Inc., Chicago, IL, USA)) version 20. Non-parametric data has been expressed as percentages such as male and female, type of goiter. were analyzed using chi square like in comparison between the types of goiter and its consistence . Significance was set at the $P \le 0.05$ level in all analyses.

Results :

Table 1.Gender of patients who are presented with goiter and the percentages of them.

		NO.	Percent
Gender	male	19	25.7
	female	55	74.3
	Total	74	100%

Table 2. The ages groups of patients with goiter.

Age groups	No.	percent	
5-14 y	11	15%	
15-44 y	15	20%	
45-60 у	35	47%	
Above 60 years	13	18%	
Total	74	100	

Table 3. Numbers and percentages of patients with solitary or MNG

	No.	Percent
solitary	33	44.6
MNG	41	55.4
Total	74	100.0

Table 4. Numbers and percentages of each types of thyroid carcinoma (papillary and follicular)

	No.	Percent
Panillary carcinoma	11	14.8% from 74
	11	68% from 16
Follicular carcinoma	5	6.7% from 74
Forneulai caremonia		32% from 16
Total	16	21.6% from 74

This table shows the numbers and percentages of each type of thyroid carcinoma (papillary, follicular) from the total number of patients with goiter (74) and from the number of patients with cancer (16). The rate of thyroid tumors among patients with goiter was 21.6.

The rate of the thyroid cancer in solitary nodule (9 from 33 ,percent 27%) is more than the rate in MNG (7 from 41,percent 17%) with no significant difference regarding the development of special type of cancer in solitary nodule or in MNG .

Table 5.The significance of x-ray exposure in the development of thyroid cancer.

	x-ray exposure			n voluo
	Positive	Negative	Total	p-value
Malignant	14(87.5%)	2(12.5%)	16	0.02

Table 6.The significance of family history of thyroid cancer in the development of it.

	Family history of thyroid cancer			
	Positive	Negative	Total	
Malignant	10(62.5%)	6(37.5%)	16	0.01

The last 2 tables show that the family history of thyroid cancer and the history of x-ray exposure in childhood are a significant risk factors as the P value is <0.05.



Discussion

The major concern in patients presenting with thyroid enlargement is to rule out the possibility of neoplastic disease .In our study we found that females patients with goiter are predominant, 74.3% female, 25.7% male (Table 1), which goes with study in Hilla city by Ali AlKatib in which 75% of patients was females ⁽¹⁶⁾. In our study the mean age of patients was 43.7 year . This is less than that reported by Al Katib⁽¹⁶⁾ (48 year), and more than that reported by Yasser A. (38.4 year) ⁽¹⁷⁾. The commonest ages at presentation were (45-60 years) (Table 2), while other study by Al- Katib reported that most of the patients were in the range of (31-40 years).⁽¹⁶⁾

Our result found 44.6% of goiter presented as solitary and 55.4% as MNG (Table 3), these result consisted with result by Albasri 2014 in Saudi Arabia

(58% MNG)⁽¹⁸⁾. In our study thyroid tumor rate was 21.6% from patients with goiter (Table 4).

In our result female were predominant in malignancy 56.3% and male 43.7% these result consisted with study in Hilla city were female 72% of malignant patients⁽¹⁶⁾.

The frequency of malignancy was higher in Solitary (27%) as compared to MNG (17%) and the same results was in study by Anwar et al 24% ⁽¹⁹⁾.

The commonest type of cancer in our patients was PTC(68% from patients with cancer, 14.8% from patients with goiter) ,followed by FTC(32% from patients with cancer, 6.7% from patients with goiter)(Table 4) other study with the same results by Al-Katib in 2009 which was 60% ⁽¹⁶⁾.

In our findings there was a positive association between patient who have malignancy with X-ray exposure and radiation (Table 5) similar result reported by study down in Kuwait demonstrate that there is association of Dental X-rays with thyroid cancer $^{(20)}$.

Other findings noted that malignancy is more prevalent in those with family history of thyroid tumor (Table 6). Another study from Kuwait conducted in 2006 reported an association between family history of benign thyroid disease and thyroid cancer ⁽²⁰⁾.

Conclusions :

Thyroid cancer is common among patients with goiter in our region. The most frequent ages that presented with goiter are between 45-60 year with female predominance. The most common type of goiter was MNG (55.4%) while the solitary nodule was 44.6%. The family history was positive in 24.4% of patients and 75.6% were with negative family history. X-ray exposure was positive in 59.4% and negative in 40.6% of patients. The papillary carcinoma of thyroid gland was found in (14.8%) of patients while the follicular carcinoma percent

was (6.7%). Family history of thyroid cancer was positive in 62.5% of patients with thyroid cancer .X-ray exposure was positive in 87.5% of thyroid cancer patients . In our study, the x-ray and family history are significant risk factors . The papillary thyroid carcinoma is more common(14.8%) than follicular thyroid carcinoma(6.7%) among patients with goiter.

Recommendations

- 1. The use of x-ray especially in childhood should be limited and used only when it is indicated .
- 2. We need a screening program to detect any development of cancer in preexisting goiter as Iraq is an endemic goiter area .

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المقدمة : يعتبر سرطان الغدة الدرقية من اكثر انواع سرطانات الغدد الصم حدوثا وقد ازداد في السنوات الاخيرة بسبب از دياد وسائل التشخيص المبكر. يحدث عادة بين الناس الذين يتعرضون بشكل متكرر الى الاشعاع (من ضمنها الاشعة السينية) والذي يعتبر هو اهم عامل من عوامل الخطورة. يوجد اختلاف كبير بين دول العالم في معدل حدوث سرطان الغدة الدرقية.

الهدف من الدراسة : تقييم نسبة حدوث سرطان الغدة الدرقية في المرضى الذين يعانون من تضخم الغدة الدرقية والذين تم احالتهم الى مستشفى الديوانية التعليمي وتقييم عوامل الخطورة المحتملة .

الطريقة : تم اختيار 74 مريض يعاني من تضخم الغدة الدرقية بشكل عشوائي من بين المرضى المحالين الى مستشفى الديوانية التعليمي , وكان عمر المرضى يزيد على 5 سنوات . تم تقييم المرضى عن طريق اخذ التاريخ المرضي (الاسم ,العمر ,التعرض الى الاشعاع والتاريخ الوراثي) و عن طريق الفحص السريري وارسالهم الى التحاليل والسونار . تم متابعة المرضى الى ما بعد اجراء عملية رفع الغدة الدرقية (بشكل كامل او جزئي) لغرض معرفة نتيجة الفحص النسيجي.

النتيجة : من خلال المعلومات المتوفرة تم التوصل الى : اغلب المرضى تتراوح اعمار هم بين 45-60 سنة. نسبة المرضى النساء المصابات بتضخم الغدة الدرقية اعلى من نسبة الرجال. نسبة المرضى المصابين بتضخم الغدة الدرقية متعدد العقد اعلى من نسبة المرضى المصابين بتضخم الغدة الدرقية احادي العقدة.

سرطان الغدة الدرقية الحليمي اكثر انتشارا من سرطان الغدة الدرقية الجريبي في المرضى المصابين بتضخم الغدة الدرقية. التعرض للاشعة السينية يعتبر من عوامل الخطورة لسرطان الغدة الدرقية. وجود تاريخ عائلي لسرطان الغدة الدرقية ايضا يعتبر من عوامل الخطورة