

CLINICOPATHOLOGICAL ASSESSMENT OF THYROID MALIGNANCIES IN A SAMPLE OF PATIENTS IN BAGHDAD DISCRETE

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ABSTRACT

Background: Thyroid cancer is the most common malignancy of endocrine system, increasing incidence is mainly due to early detection of small cancers; it occurs at any age; it is about (3-4) times higher among women than men, in Iraq represents the 2nd cancer in women. **Aim of study:** To count the frequency of types of thyroid malignancies in a sample of Iraqi patients in Baghdad discrete, and to assess the clinicopathological parameters in the studied cases. **Methods:** Retrospective and prospective study including analysis of 100 randomly selected patients with thyroid malignancies collected from Teaching Laboratories of Al-Emamain Al-Kadhumain Medical City (AS) and Baghdad Medical City from January 2018 to January 2019; collected samples were formalin fixed paraffin embedded blocks and hematoxylin and eosine stained slides; as well as clinicopathological data from patients' case sheet. **Results:** Most patients at age (30-39), female to male ratio was 6.69:1. Ninety one percent of patient had goiter with significant association with papillary carcinoma, 28% of cases had lymphadenopathy with significant association with medullary carcinoma, 48% of cases had tumor size (1-3) cm³ and 57% presented in stage T1 with significant association with papillary carcinoma. **Conclusion:** Most common type of thyroid malignancy in this study was papillary carcinoma then follicular and medullary carcinoma; borderline thyroid tumor represents 22% of cases, correlation between history, physical examination, laboratory examination, ultrasound (U/S) finding and histopathological features are essential for diagnosis.

KEYWORDS: Thyroid, cancer, clinicopathological, papillary, follicular, medullary.

INTRODUCTION

Thyroid cancer is the most common malignancy of endocrine system and it rises in the incidence. The increasing incidence is partially due to early detection of asymptomatic small cancer.^[1] The incidence of thyroid cancer is about 3-4 times higher among women than men (5th cancer in women worldwide according to WHO 2018).^[2] It occurs at any age but it is rare in children. Most tumors are diagnosed during 3rd -6th decade of age.^[3] The thyroid cancer in Iraq represents the 2nd cancer in women (according to Iraqi cancer registry 2016).^[4] The risk factors of thyroid cancer include radiation which is the most important risk factor;^[5] at young age the thyroid gland is a very radiosensitive organ so when children exposed to radiation frequently will be at risk to develop papillary thyroid cancer (PTC).^[6] Iodine deficiency causes an increased level of thyroid stimulating hormone (TSH), a main growing factor for follicular cells of thyroid;^[7] so in iodine-

deficient areas there is more follicular and fewer papillary carcinomas.^[8] The frequency of PTC in patients with autoimmune thyroiditis is related to serum TSH not to the presence of antithyroid antibodies.^[9] Insulin resistance was present in 50% of PTC patients.^[10] Only about 5-10 % of thyroid cancers are familial and the vast majority are sporadic.^[11] The vast majority of thyroid cancers present as thyroid nodules detected by the patient, by the clinician, or with imaging of the neck for other disorders. Thyroid cancer prognosis depends on several factors which include; histology in which papillary thyroid carcinoma and follicular thyroid carcinoma are associated with the best survival rates, while medullary thyroid carcinoma and anaplastic thyroid carcinoma have significantly poorer outcomes. Other prognostic factors are tumour size, lymph node metastasis, extrathyroidal extension, distant metastases, age, gender and delay in therapy.^[12] **Aim of study:** To count the frequency of types of thyroid malignancies in a

sample of Iraqi patients in Baghdad discrete, and to assess the clinicopathological parameters in the studied cases.

MATERIAL AND METHOD

A retrospective and prospective study including analysis of 100 randomly selected patients with thyroid malignancies collected from Teaching Laboratories of Al-Emamain Al-Kadhmain Medical City (AS) and Baghdad Medical City from January 2018 to January 2019.

The collected data include

- Demographic analysis (name, age, residency and gender).
- Clinical presentation (goiter, shortness of breath, LAP and others).
- Relevant investigations (thyroid function test, radiological investigation).
- Post-operative histopathological diagnosis.

Collected samples were formalin fixed paraffin embedded blocks and hematoxylin and eosine stained slides.

New section from each block were taken, stained with haematoxylin and eosin and the diagnoses were revised by senior pathologist (supervisor of this study).

The research lasted for 1 year started in January 2019 and finished in January 2020.

The data analyzed using Statistical Package for Social Sciences (SPSS) version 25. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Chi square test was used to assess the association between provisional diagnosis and certain information. A level of P – value less than 0.05 was considered significant.

RESULTS

Age and gender: The distribution of patients according to age and gender is shown in figures (1 and 2), respectively. Patients’ age was ranging from 14 to 70 years with a mean of 38.83 years and standard deviation (SD) of ± 10.97 years. Regarding gender, female to male ratio of 6.69:1.

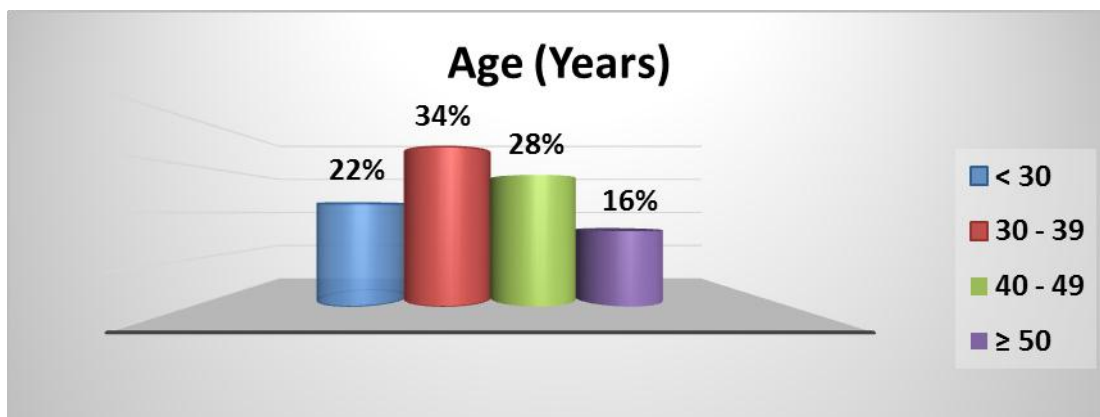


Figure 1: Age distribution of patients with thyroid malignancy.

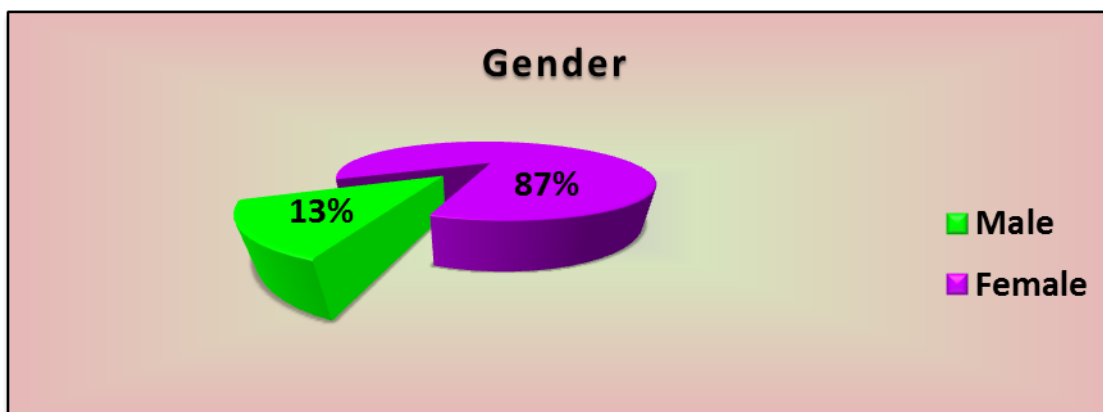


Figure 2: Gender distribution of patients with thyroid malignancy.

Table 1 shows the distribution of patients by clinical information.

Table 1: Distribution of patients by clinical information.

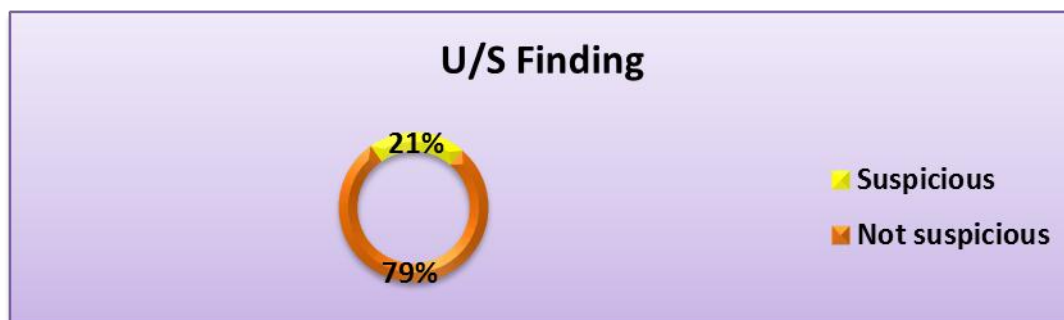
Clinical Information	No. (n= 100)	Percentage (%)
Presentation		
Goiter	91	91.0
Solitary thyroid nodule	9	9.0
Lymphadenopathy		
Yes	28	28.0
No	72	72.0
Thyroid state		
Euthyroid	94	94.0
Hyperthyroidism	4	4.0
Hypothyroidism	2	2.0

Table 2 show the distribution of patients by tumor size and stage. Patient's tumor size was ranging from 0.1 to 5 cm³ with a mean of 1.47 cm³ and SD of ± 1.13 cm³.

Table 2: Distribution of patients by tumor size and stage.

Variable	No. (n= 100)	Percentage (%)
Tumor Size (cm³)		
< 1	44	44.0
1 - 3	48	48.0
> 3	8	8.0
Stage n= 78		
T1	57	73.1
T2	15	10.2
T3	4	5.1
T4	2	2.6

Figure 3 shows the distribution of patients by U/S finding, in which the U/S finding was suspicious in 21% of cases and not suspicious in 79%.

**Figure 3: Distribution of patients by U/S finding.**

The distribution of patients by final diagnosis is shown in table 3, the highest proportion of patients 63% diagnosed with papillary carcinoma.

Table 3: Distribution of study patients by final diagnosis.

Final Diagnosis	No. (n= 100)	Percentage (%)
Papillary Carcinoma	63	63.0
Follicular Carcinoma	11	11.0
Medullary Carcinoma	4	4.0
Borderline thyroid tumor	22	22.0

Table 4 shows the association between final diagnosis with age and gender. There were no significant associations ($P \geq 0.05$) between final diagnosis with age and gender.

Table 4: Association between final diagnosis with age and gender.

Variable	Final Diagnosis				Total (%) n= 100	P- Value
	Papillary Ca (%) n= 63	Follicular Ca (%) n= 11	Medullary Ca (%) n= 4	Borderline Th Tumor (%) n= 22		
Age (Year)						
< 30	13 (59.1)	3 (13.6)	0 (0)	6 (27.3)	22 (22.0)	0.356
30 - 39	26 (76.5)	2 (5.9)	1 (2.9)	5 (14.7)	34 (34.0)	
40 - 49	16 (57.2)	3 (10.7)	3 (10.7)	6 (21.4)	28 (28.0)	
≥ 50	8 (50.0)	3 (18.8)	0 (0)	5 (31.2)	16 (16.0)	
Gender						
Male	6 (46.1)	1 (7.7)	1 (7.7)	5 (38.5)	13 (13.0)	0.366
Female	57 (65.5)	10 (11.5)	3 (3.4)	17 (19.6)	87 (87.0)	

Table5 shows association between final diagnosis and clinical information.10.7% of patients with LAP were diagnosed with medullary carcinoma with a significant

association ($P=0.032$).Regarding presentation, 64.8% with goiter were diagnosed with papillary carcinoma with a significant association ($P= 0.009$).

Table 5: Association between final diagnosis and clinical presentation.

Variable	Final Diagnosis				Total (%) n= 100	P- Value
	Papillary Ca (%) n= 63	Follicular Ca (%) n= 11	Medullary Ca (%) n= 4	Borderline Th Tumor (%) n= 22		
LAP						
Yes	18 (64.3)	0 (0)	3 (10.7)	7 (25.0)	28 (28.0)	0.032
No	45 (62.5)	11 (15.3)	1 (1.4)	15 (20.8)	72 (72.0)	
Thyroid state						
Goiter	59 (64.8)	7 (7.7)	4 (4.4)	21 (23.1)	91 (91.0)	0.009
Solitary thyroid nodule	4 (44.4)	4 (44.4)	0 (0)	1 (11.1)	9 (9.0)	

Table 6 shows the associations between final diagnosis and both of tumor size and stage. Most cases of papillary carcinoma was found in patients who had tumor size < 1 cm³ with a significant association ($P= 0.007$). Fifty case

(87.6%) of patients who staged (T1) were diagnosed with papillary carcinoma with a significant association ($P= 0.048$).

Table 6: Association between final diagnosis with tumor size and stage.

Variable	Final Diagnosis				Total (%) n= 100	P- Value
	Papillary Ca (%) n= 63	Follicular Ca (%) n= 11	Medullary Ca (%) n= 4	Borderline Th Tumor (%) n= 22		
Tumor Size (cm³)						
< 1	35 (79.5)	1 (2.3)	0 (0.0)	8 (18.2)	44 (44.0)	0.007
1 - 3	22 (45.8)	8 (16.7)	4 (8.3)	14 (29.2)	48 (48.0)	
> 3	6 (75.0)	2 (25.0)	0 (0.0)	0 (0.0)	8 (8.0)	
Stage n= 78						
T1	50 (87.6)	6 (10.6)	1 (1.8)	0 (0)	57 (73.1)	0.048
T2	8 (53.3)	4 (26.7)	3 (20.0)	0 (0)	15 (19.2)	
T3	3 (75.0)	1 (25.0)	0 (0)	0 (0)	4 (5.1)	
T4	2 (100.0)	0 (0)	0 (0)	0 (0)	2 (2.6)	

DISCUSSION

In current study, the most common age at presentation was between (30-39) year comprising 34% of cases which is parallel to study done by Alkatib et al 2009.^[13]

also with other studies (Abdulmughni et al 2004, Hussain et al 2013, Al-Zaher et al 2008,^[14,15,16]); but disagree with study by Franceschi et al in 1987.^[17] The mean age of thyroid cancer 38.83 years with range from 14 to 70

years; this is comparable with research in by Abdulmughni et al 2004.^[14] and disagree with study done by Hussain et al 2013.^[15] Regarding gender; in the present study female to male ratio 6.69:1, this result is nearly similar to research by Abdulmughni et al 2004.^[14] and this is agrees studies by (Al-Katib et al 2009, Albasri et al 2014).^[13,18] According to clinical information in this study most patient present with goiter 91%, 9% present with solitary thyroid nodule this results agree with study done by Alkatib 2009.^[13] and also agree with the study done by Al-Zaher et al 2008.^[16] but disagree with study done by Habban et al 2018.^[19] Lymphadenopathy(LAP) present in 28 case of thyroid cancer while the rest of the cases (72%) has no lymphadenopathy this results are nearly agreeing with results of previous study done by Alkatib et al 2009 but differ from other study done by Abdulmughni et al 2004.^[13,14] About thyroid state in this study the majority of patient present in euthyroid state (94%), while (4%) presented in hyperthyroid state and only (2%) presented in hypothyroid state this is nearly goes with results from the study by Franceschi et al 1986.^[17] and disagree with results of previous study done by Alkatib et al 2009.^[13] About tumor size and stage the highest proportion of patients had tumor size 1 – 3 cm³(48%). This results are different from results of previous study done by Zuberi et al in 2004.^[20] Regarding stage, T1 was the most common among patients (73.1%), T2(10.2%), T3 (5.1%) and T4 (2.6%). In compared with previous study done by Xiang et al 2010 T1 was also the most common among patient represent (76.9%) of total cases while T2(6.99%), T3 (13.46%) and T4 (2.62%).^[21] another study done by Liu et al 2013 in which T1 (75%), T2 (4%), T3 (17%), T4 (4%).^[22] In this study the highest proportion of patients was diagnosed as papillary carcinoma (63%), while follicular carcinoma represent (11%), medullary carcinoma (4%) and borderline thyroid tumor (22%), this results goes with studies done (by Al-Katib et al in 2009, Larijani et al in 2005).^[13,23] But against the result of previous study done by Edino et al in 2010.^[24] In this study (10.7%) of patients with LAP were diagnosed with medullary carcinoma with a significant association (P= 0.032). This result goes with result of the study done by Machens et al 2007.^[25] Regarding presentation (64.8%) of patients with goiter were diagnosed with papillary carcinoma with a significant association (P= 0.009), this disagree with the results of study done by Habban et al 2018 in Iraq.^[20]

CONCLUSION

Correlation between history, physical examination, laboratory examination, ultrasound finding and histopathological features are essential for final diagnosis for patient with thyroid tumor. Borderline thyroid tumor represents 22% of cases, follicular tumor of uncertain malignant potential (FT-Ump) and noninvasive follicular tumor with papillary like nuclear feature (NIFTP) found in the same percentage followed by well differentiated tumor of uncertain malignant potential (WDT-Ump); the

importance of border line thyroid tumor to avoid over treatment of patient with thyroid tumor.

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