

INCIDENCE OF PAPILLARY THYROID CARCINOMAS IN BASRAH CITY

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ABSTRACT

Introduction: The incidence of papillary thyroid cancer has increased at high rate. Most of cases occur among females and is being sixth most common cancer in the females. Papillary thyroid carcinomas (PTC) are mainly diagnosed by fine needle aspiration cytology (FNAC) and histologically; and treatment choices depends upon cancer stage.

Aim: To estimate the incidence of papillary thyroid carcinomas in Basrahcity and analyse the results with published data. **Methodology:** A total number of 78 cases were collected from histopathological governmental and private pathologic laboratories during two years

period (2018 and 2019). Demographic data were based on age, sex and subtypes of PTC.

Results: The incidence of papillary thyroid carcinoma for the two years 2018 and 2019 was found to be 1.37 and 1.41 per 100,000 population, respectively. The most frequent sub-type of the papillary thyroid carcinoma was the classical one (66.7%), while the least was the tall cell (2.6%). Also, the occurrence of other types of thyroid carcinomas was close to the percentage of PTC. PTC was mostly predominant in females (89.7%) and the mean age of the patients was 35 years. **Conclusion:** The incidence of PTC for 2018 and 2019 were 1.37 and 1.41, respectively, which means there is no great difference in the incidence of PTC for these two years. The classical variant of PTC was the most predominant subtype and higher rates of occurrence among females. Other types of thyroid carcinomas were closely similar to the percentage of PTC. PTC occurs at younger age group than other types of thyroid carcinomas.

INTRODUCTION

Thyroid is the largest endocrine gland in the body and it is responsible for the commonest primary endocrine cancer, though it is 1% of all body cancer.^[1,2] Papillary thyroid cancer

(PTC) is about 80- 85% of thyroid malignancy.^[2,3] The incidence of thyroid cancer has increased at rate higher than other cancer in the past decades.^[4] this is for several reasons include: real increase incidence of papillary thyroid cancer, increase neck imaging and fine needle aspiration and increase exposure to radiation.^[1,5]

Seventy five percent of PTC occurs among females accounting the sixth most common cancer in the females, it is also differing by race and ethnicity noticed to be twice higher in white people and Asian.^[6]

Diagnosis of papillary thyroid cancer can be achieved by FNAC with 90% accuracy rate.^[7]

In the past, PTC cancer was considered as single group with excellent prognosis and indolent course, however that have been changed and PTC is now further classified to different subtypes according to prognostic significance.^[8]

There are many subtypes of PTC include: conventional (classical), microcarcinoma (< or = 1 cm, mostly discovered incidentally), follicular variant, tall cell variant, Warthin like variant, papillary cancer with nodular fasciitis_ like stroma, cribriform morular variant, diffuse sclerosis variant, solid variant, hobnail variant and encapsulated variant.^[9,10,11] The most common type is conventional (classical) and is the best prognosis,^[9] while the most aggressive subtypes are tall cell, hobnail and columnar cell variants.^[12]

Grossly, PTC usually measure more than 1-1.5 cm with average 2-3 cm or may be larger, it is usually firm, white, invasive appearance and calcification are common features, the lesion maybe partially cystic but rarely completely cystic, also encapsulation seen in 8-13% of papillary carcinomas.^[13]

Microscopically, FNA cytology may reveal papillary structure but the preoperative diagnosis based on the typical nuclear features as

Orphan Annie nuclei, intranuclear pseudo inclusion (due to cytoplasmic invaginations) and nuclear grooves (fold in nuclear membrane).^[14]

Histologically, PTC is diagnosed mainly by papillary structures and nuclear features which include: nuclear enlargement, elongation and overlapping; also, it is characterized by chromatin clearing, margination, ground glass nuclei and Orphan Annie nuclei; and also, the

nuclear membrane would be irregular with nuclear grooves and pseudo inclusions.

Molecular feature of PTC is often characterized by RET chromosomal rearrangement or point mutation of RAS or BRAF protein oncogene, which are found in 70% of PTC.^[15]

Most papillary cancer can be diagnosed immunohistochemically by positivity for thyroglobulin, thyroid transcription factor-1 (TTF 1), cytokeratin AE1/AE3, CK7 and PAX8 which are marker of thyroid follicular cells.^[16,17]

Treatment of PTC depend on biologic features and stage of cancer and include thyroidectomy, central neck dissection and post-operative radio iodine ablation.^[3] In case of size more than 1 cm, total thyroidectomy is performed.^[18]

Recurrence of PTC occurs in follicular variant PTC, older age, central lymph node involvement and stage IV tumor.^[19]

METHODOLOGY

Cross sectional retrospective study was done in Basra city / Iraq, during the period from beginning of January 2018 till the end of December 2019.

Papillary thyroid carcinomas were selected from the cases of thyroid carcinomas that were collected from histopathological reports from archives of governmental and private pathologic laboratories.

Demographic data were based on age, sex, types of papillary thyroid carcinomas and other types of thyroid carcinomas.

RESULTS

From a total of 116 cases of thyroid carcinomas, 78 cases of papillary thyroid carcinomas (PTC) were included in this study.

The incidence of papillary thyroid carcinoma was found to be 1.37 and 1.41 per 100,000 population in 2018 and 2019, respectively, as calculated below:

Incidence:1. 2018

$(36/ 2617642) \times 100,000 \text{ population} = 1.37/ 100,000 \text{ population.}$

2. 2019

$(42/2985073) \times 100,000$ population = 1.41/100,000 population.

Regarding the other types of thyroid carcinomas (38cases), 21 cases (55.3%) and 17 cases (44.7%) were diagnosed during 2018 and 2019 respectively (Table 1). There was no any significant difference in the occurrence of PTC and other types of thyroid carcinomas during the two years.

Table (1): Distribution of papillary thyroid carcinoma and other types of thyroid carcinoma in 2018 and 2019.

		Category		Total Number (%)
		PTC* Number (%)	OTTC** Number (%)	
Year	2018	36(46.2%)	21(55.3%)	57(49.1%)
	2019	42(53.8%)	17(44.7%)	59(50.9%)
Total		78(100.0%)	38(100.0%)	116(100.0%)

Chi-Square= 0.85, P-value= 0.36

*PTC=Papillary thyroid carcinomas.

**OTTC=Other types of thyroid carcinomas.

The most frequent sub-type of the papillary thyroid carcinoma was the classical variant (66.7%), while the least was the tall cell variant (2.6%).

The mean age of the 116 patients with thyroid carcinomas was 39.62years \pm 14.67 SD with a range of 15 to 73 years.

The mean age of PTC patients was 34years \pm 12.26 SD with a range of 15 to 70 years (**Table 2**).

Regarding PTC subtypes, tall cell variant patients were the oldest(with mean age =42 years), while microcarcinoma variant patients were the youngest (with mean age =19 years) (**Table2**).

The mean age of patients with other types of thyroid carcinomas was 50 years \pm 15.71 SD with a range of 17 to 73 years.

Patients with PTC were younger than patients with other types of thyroid carcinomas and this age difference was statically significant(P-value=0.0001).

Table (2): The frequency and mean age distinction of the papillary thyroid carcinoma sub-types.

Sub-type (Variants)	Frequency	Percent(%)	Mean age/year
Classical	52	66.7	34
Follicular variant	12	15.4	38
Microcarcinoma	12	15.4	19
Tall cell	2	2.6	42
Total	78	100.0	

(P-value=0.0001)

As for sex, there was a female predominance in both PTC and other types of thyroid carcinomas with difference female/male ratio: 8.75(70/8) and 2.45(27/11) respectively, as shown in (Table 3).

It is clear that there is a significant statistical association of the occurrence of thyroid carcinomas and being a female (P- value=0.011).

Table (3): Distribution of papillary thyroid carcinoma and other types of thyroid carcinoma according to sex.

		Category		Total Number (%)
		PTC Number (%)	OTTC Number (%)	
Gender	Male	8(10.3%)	11(28.9%)	19(16.4%)
	Female	70(89.7%)	27(71.1%)	97(83.6%)
Total		78(100.0%)	38(100.0%)	116(100.0%)

Chi-Square= 6.52, P-Value= 0.011

DISCUSSION

Papillary thyroid carcinomas are the most common histological types of differentiated carcinomas of the thyroid gland and mostly has an excellent prognosis.^[3]

In this study, the incidence of papillary thyroid carcinoma was found to be 1.37 and 1.41 per 100,000 population in 2018 and 2019 respectively, and as compared to study done in India which showed that the incidence of papillary thyroid cancer is less than 1%,^[8] and if compared to a study done in the USA (2016) would show the incidence was 8.15²⁰, these differences were probably related to an etiological and geographical factor which is correlated with these studies.

Total number of cases of PTC collected in present study in Basrah for the years 2018 and 2019 was 36, 42 respectively, which were close to the number of cases in a study done in Basrah

city/ Iraq from 2005 to 2011 with an average 34 case per year.^[21]

The percentage of PTC in this study was 46.2% and 53.8% for 2018 and 2019, respectively, as compared to other types of thyroid carcinomas in Basrah for these years, were no any significant differences in the occurrence but if compared to a study done in USA (2016) showed PTC percentage was 87.8% of all thyroid cancers²⁰, which could be related to different methods of collection of cases and a small sample size in this study.

In this study, the most common subtype of PTC was the classical variant (66.7%) as compared to a study was done in Malaysia 2018 which has similar result.^[7] While the least common type was tall cell PTC (2.6%) which was identical to study done in India which report a case of tall cell variant of papillary thyroid carcinoma (2.70%).^[8]

In the current study, the comparison of the mean ages among different subtypes of PTC was shown that the mean age of classical PTC patients was 36 years, follicular PTC was 39 years, microcarcinoma was 24 years and in tall cell PTC are 42 years, which were close to the mean ages in a study done in Kuwait which showed that the mean ages were 31.5, 34, 27, 47.5 years in classical PTC, follicular PTC, microcarcinoma and tall cell variant PTC,^[22] respectively.

Thyroid carcinomas in present study were significantly higher in females which was equal to 83.6% and PTC also higher in females (89.7%), which was close if compared to a study done in Baghdad/Iraq showed a female predominance of thyroid cancer with (80%) and also (80%) of PTC patients were females.^[23]

The mean age of patients with PTC was younger (35 years) than patients with other types of thyroid cancers (48 years) which correspond to study done in Brazil showed that most cases of PTC were between 22-44 years while other types of thyroid carcinomas were more than 45 years old.^[24]

LIMITATIONS

Comparison among subtypes of PTC according to sex was not done because of limited number of cases, that will need a large sample size.

CONCLUSION

This study demonstrates that the incidence of PTC for 2018 and 2019 were 1.37 and 1.41, respectively, which means there is no great difference in the incidence of PTC for these two

years, with the classical variant of PTC being the most predominant subtype and higher rates of occurrence among females.

The occurrence of other types of thyroid carcinomas was greatly close to the percentage of PTC and PTC occurs in a younger age group than other types of thyroid carcinomas.

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