



CLINICOPATHOLOGICAL STUDY OF PAPILLARY CARCINOMA THYROID IN TERTIARY CARE CENTRE- THREE YEAR STUDY.

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ABSTRACT

Introduction: Papillary carcinoma thyroid (PTC) is the predominant form of thyroid cancer in both adults and children [1]. The incidence of thyroid cancer is increasing [2]. Incidence of PTC is 3 times more common in female than male, but this disparity decreases with increasing patient age [1].

Aim: To analyse the clinicopathological profile of PTC in Madras Medical College located in Chennai, TamilNadu, India.

Materials And Methods: Data on age, sex, size, histological subtype, centrality of the tumor, nodal metastasis, extra thyroidal extension and associated non malignant condition of all cases of PTC diagnosed in Madras Medical College, Chennai from January 2016 to December 2018 were obtained from clinicopathological documents. Histopathological slides were analysed and The cases were divided into four catagories based on age and sex.

Result: Totally 189 thyroid malignancies were reported of which 161 were PTC (85%). Female: male ratio was 3.5: 1. This disparity decreases after 50 years of age. In males above 50years of age had nodal metastasis (47%) and extra thyroidal extension (47%) which was high when compared with other groups. Extrathyroidal extension (50%) was found to be more frequent in cases with tumor size more than >4cm.

Conclusion: Papillary thyroid carcinoma was common in female. Extra thyroidal extension (P =0.014996), nodal metastasis (P =0.030258) was most common in elderly male (> 50 years).

KEYWORDS : Papillary carcinoma thyroid, nodal metastasis, extrathyroidal extension, centrality.

INTRODUCTION:

Papillary thyroid carcinoma is a malignant epithelial tumor showing evidence of follicular cell differentiation and set of distinctive nuclear features. PTC is the most common type accounting for 85% of thyroid carcinoma[3]. The tumor invade lymphatics, leading to multifocal lesion and to regional node metastasis[4]. Size of PTC is widely variable with mean diameter of 2-3 cm[5]. Two cardinal features of conventional PTC are papillae and nuclear features [1]. The epidemiology and clinicopathological features vary greatly with geography. This made us to analyse the clinicopathological profile of PTC.

MATERIALS AND METHODS:

This was a cross sectional study conducted in Madras Medical College from January 2016 to December 2018 in cases diagnosed as Papillary carcinoma thyroid. Data including age, sex, size, centrality, extrathyroidal extension, nodal metastasis, were collected from clinicopathological records and histopathological slides were reviewed.

The cases were divided into four categories based on age and sex such as younger female (≤50 years), old female (>50 Years), younger males (≤50 years) and old male (>50 years) and the following features were analysed which includes- size of the tumor (1cm, 1-2cm, 2-4cm, >4cm) , presence of extra thyroidal extension, nodal metastasis. Size of the tumor was correlated with presence of extrathyroidal extension.

OBSERVATION AND RESULT

In this study period 189 thyroid malignant cases have been reported, of which 161 were papillary carcinoma (table 1). Among PTC cases 125(78%) were female and 36(22%) were male (table 2). Conventional type of papillary carcinoma was 123(76%)(Figure 1), follicular variant was 11(7%)(Figure 2)(table 3). Other variants reported was tall cell variant, solid variant, dedifferentiated variant, and fasciitis like stroma variant.

Table 1: Types Of Thyroid Malignancies

| S.No | Thyroid malignancy | Number of cases |
|------|---------------------|-----------------|
| 1. | Papillary carcinoma | 161 (85.2%) |
| 2. | Insular carcinoma | 4 (2.1%) |

| | | |
|-----|----------------------|------------|
| 3. | Medullary carcinoma | 5 (2.6%) |
| 4. | Follicular carcinoma | 5 (2.6%) |
| 5. | Anaplastic carcinoma | 3 (1.6%) |
| 6. | Hurthle cell adenoma | 1 (0.5%) |
| 7. | Follicular adenoma | 1 (0.5%) |
| 8. | NIFTP | 3 (1.6%) |
| 9. | WDTUMP | 3 (1.6%) |
| 10. | NHL | 2 (1.1%) |
| 11. | Metatasis | 1 (0.5%) |
| | total | 189 |

Totally 189 thyroid malignancy were reported in the past three years, of which 161 cases (85%) were papillary carcinoma followed by follicular carcinoma and medullary carcinoma of thyroid, both accounting for 2.6% of total cases.

Table 2: Age And Sex Distribution Of Papillary Carcinoma

| Age | Male | Female | Total |
|--------|------|--------|-------|
| 0-10 | 0 | 0 | 0 |
| 11-≤20 | 1 | 3 | 4 |
| 21-≤30 | 6 | 32 | 38 |
| 31-40 | 2 | 36 | 38 |
| 41-50 | 12 | 32 | 44 |
| 51-60 | 12 | 15 | 27 |
| 61-70 | 6 | 1 | 7 |
| 71-80 | 2 | 1 | 3 |
| >80 | 0 | 0 | 0 |
| Total | 36 | 125 | 161 |

In our study PTC is common in 2nd to 4th decade (120 cases- 74%). There was 125 females and 36 male with male to female ratio of 1:3.4.

Table 3: Variants Of Papillary Carcinoma

| S.No | Papillary carcinoma variants | No of cases | percentage |
|------|------------------------------|-------------|------------|
| 1 | conventiona type | 123 | 76% |
| 2 | Follicular | 11 | 7% |
| 3 | Oncocytic | 5 | 3% |

| | | | |
|---|-----------------------|-----|-----|
| 4 | tall cell | 2 | 1% |
| 5 | solid | 1 | 1% |
| 6 | micro | 16 | 10% |
| 7 | dedifferentiated | 2 | 1% |
| 8 | Fasciitis like stroma | 1 | 1% |
| | Total | 161 | |

This table enlist the variants of papillary thyroid carcinoma reported in our institution from January 2016 to December 2018. Conventional type was the common variant followed by Papillary micro carcinoma accounting for 10% of the cases.

Table 4: Prognostic Factors In Papillary Carcinoma Thyroid

| S.No | Prognostic factor | Present | Absent |
|------|--------------------------|---------|----------|
| 1 | Multifocality | 40(25%) | 121(75%) |
| 2 | Extrathyroidal extension | 41(25%) | 120(75%) |
| 3 | Nodal metastasis | 43(27%) | 118(73%) |

This table shows the percentage of cases with multifocality, extra thyroidal extension and nodal metastasis found to be 25%,25%and 27% respectively.

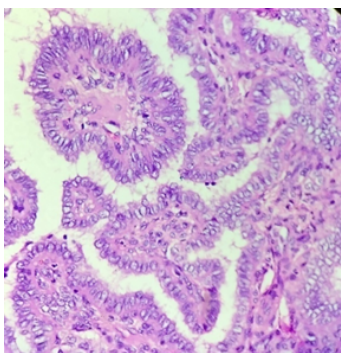


Figure1- (H&E 100x) - Papillary Carcinoma Conventional Type

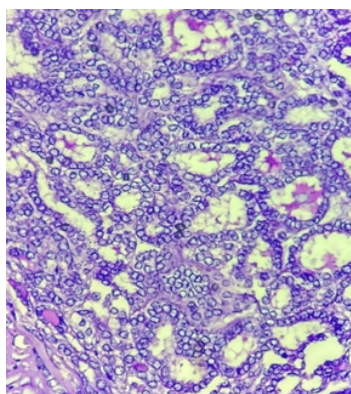


Figure2- (H&E 100x) - Follicular Variant Of Papillary Carcinoma

CORRELATION BY STATISTICAL ANALYSIS

There was a correlation between age and sex of the patient. The female preponderance is seen in age group ≤ 50 and it is decreasing in age group > 50 [table 5]. PTC cases were most common in female (83%) in age group ≤ 50, but this declines to 59% in elderly age group (p= 0.002492). In our study we categorise the cases based on age and sex into four groups. Nodal metastasis, size of lesion, extra thyroidal extension and centricity were compared. Our study indicates that larger lesion (p=0.004452)[table 6], nodal metastasis(p= 0.030258)[table 7] and extrathyroidal extension(p= 0.014996)[table 8] are more frequent in elderly male. No significant association was observed in centricity of the lesion. In our study size of the tumor was correlated with presence of extra thyroidal extension. Extrathyroidal extension was common in tumor size more than 4cm (p=0.028032)[table 9].

Table 5: Correlation Between Age And Sex

| Age (years) | females | males | Female :male ratio | Total | Pearson chi square value | p- value |
|-------------|----------|---------|--------------------|------------|--------------------------|----------|
| ≤ 50 | 103(83%) | 21(17%) | 5:1 | 124 | 9.1463 | 0.002492 |
| > 50 | 22(59%) | 15(41%) | 1.5:1 | 37 | | |
| Total | 125(78%) | 36(22%) | | 161 (100%) | | |

Table 6: Correlation Between Age And Sex Of The Patient With Size Of The Lesion

| Patient categories | Size of the tumor ≤ 4cm | Size of the tumor >4cm | Total | Pearson chi square value | p- value |
|--------------------|-------------------------|------------------------|-------|--------------------------|----------|
| Young female | 100(66%) | 3(30%) | 103 | 13.0869 | 0.004452 |
| Old female | 20(13%) | 2(20%) | 22 | | |
| Young male | 20(13%) | 1(10%) | 21 | | |
| Old male | 11(7%) | 4(40%) | 15 | | |
| Total | 151(100%) | 10(100%) | 161 | | |

Table 7: Correlation Between Age And Sex Of The Patient With Nodal Metastasis

| Patient categories | Nodal metastasis present | Nodal metastasis is absent | Total | Pearson chi square value | p- value |
|--------------------|--------------------------|----------------------------|-----------|--------------------------|----------|
| Young female | 21(20.4%) | 82(79.6%) | 103(100%) | 8.9284 | 0.030258 |
| Old female | 6(27%) | 16(73%) | 22(100%) | | |
| Young male | 8(38%) | 13(62%) | 21(100%) | | |
| Old male | 8(53%) | 7(47%) | 15(100%) | | |
| Total | 43(27%) | 118(73%) | 161(100%) | | |

Table 8: Correlation Between Age And Sex Of The Patient With Presence Of Extra Thyroidal Extension In Papillary Carcinoma Thyroid

| Patient categories | Extra thyroidal extension - present | Extra thyroidal extension - absent | Total | Pearson chi square value | p- value |
|--------------------|-------------------------------------|------------------------------------|-----------|--------------------------|----------|
| Young female | 18(17%) | 85(83%) | 103(100%) | 10.4656 | 0.014996 |
| Old female | 9(41%) | 13(59%) | 22(100%) | | |
| Young male | 7(33%) | 14(67%) | 21(100%) | | |
| Old male | 7(47%) | 8(53%) | (100%) | | |
| Total | 41 | 120 | | | |

Table 9: Correlation Between Size Of The Lesion And Presence Of Extra Thyroidal Extension

| Size of the lesion | Extra thyroidal extension - present | Extra thyroidal extension - absent | Total | Pearson chi square value | p- value |
|--------------------|-------------------------------------|------------------------------------|-----------|--------------------------|----------|
| ≤1 | 9(18%) | 41(82%) | 50(100%) | 9.0967 | 0.028032 |
| 1-≤2 | 5(14%) | 30(86%) | 35(100%) | | |
| 2- ≤4 | 22(33%) | 44(67%) | 66(100%) | | |
| >4 | 5(50%) | 5(50%) | 109(100%) | | |
| Total | 41 | 120 | 161 | | |

DISCUSSION

PTC was the most common malignant thyroid tumor (80-85%)[6]. PTC was more common in women. Most of the PTC cases manifest in the age group of 20-50[1].In our study PTC is

common in 2nd to 4th decade (table 2). The ratio of women to men in most series ranges between 2:1 to 4:1 [7,8,9], but this disparity decreases with increasing patient's age [1]. In our study the ratio of female : male in age group ≤ 50 is 5:1, but the ratio is decreasing in age group > 50 is 1.5:1 (table 4). Study conducted by Ponnusamy karkuzhali et al also shows greater percentage of male cases above the age 45 whereas most female cases occurred at ages less than 45 [10].

The variants of papillary carcinoma are Conventional, Follicular, Encapsulated, Papillary microcarcinoma, Tall cell, Diffuse sclerosing, Oncocytic, Columnar cell, Solid, Clear cell, Cribriform morular, Macrofollicular, PTC with prominent hobnail features, PTC with fasciitis-like stroma, Combined papillary and medullary carcinoma, PTC with dedifferentiation to anaplastic carcinoma [11]. Among the variants of PTC, conventional type was the commonest variant (76%) in our study, followed by papillary microcarcinoma (10%) [table 3]. Whereas study on 82 cases of PTC conducted by Muzaffar et al, shows conventional PTC was most common (70.7%) followed by follicular variant (13%) [12].

Papillary micro carcinoma of thyroid (PMTc) is defined as PTC with size equal to or less than 1cm. In our study, we have found 16 cases of PMTc, accounting 10% of PTC [table 3]. Lombardi et al, in a series of 2220 patients, found 933 PMTc cases accounting 2.3%. [13] Page et al, in their study they were found 65 cases of PMTc out of 187 thyroid cancers (2.87%). [14] Poor prognostic factors in Papillary carcinoma include older age at diagnosis, male sex, tumor size, extrathyroidal extension. Malandrino et al from Italy in their study stated that tumor size, lymph node metastasis, extra thyroidal extension were considered as risk factors for recurrence [15]. Machens A et al., in his study on gender disparities between male and female patients with thyroid cancer observed that increase in primary tumour diameters and lymph node metastasis were seen significantly more often in male patients [16]. The exact reason behind these gender disparities in thyroid cancer remains to be solved and the effects of oestrogen on thyroid cancer cells is being actively explored [17]. In our study larger lesion, nodal metastasis and extrathyroidal extension are more frequent in elderly male which is similar to the study conducted by Machens A et al. [16].

Multifocality was the marker of worst prognosis. Controversy exists as to whether this phenomenon is the result of intra thyroidal lymph vessel spread or true multifocal transformation of follicular epithelium. Incidence of multifocality ranges from 18 to 22% [18]. Multifocality in PTC cases in our study was found to be 25% [table 4].

Extrathyroidal extension is defined as tumor extension beyond the capsule of thyroid into the adjacent soft tissue. Extrathyroidal extension into soft tissue of the neck occurs in 10 to 34% of cases [19]. 35% of patient had clinically evident lymphadenopathy at the time of presentation. [18]. When compared with other studies extrathyroidal extension and nodal metastasis in our study was 25% and 27% respectively [table 4].

CONCLUSION:

Frequency of PTC was more common in younger female when compared to males. Our study showed that this gender disparity decreases with increasing age. To summarise there was a significant correlation between size of lesion, extra thyroidal extension and nodal metastasis with age and sex of the patient. Significant correlation was also observed between size of the lesion and presence of extra thyroidal extension. From our study it was observed that male over the age of 50 have increased risk of having extra thyroidal extension and nodal metastasis.

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