

RELATIONSHIP BETWEEN AGE AND GENDER WITH THE HISTOPATHOLOGICAL TYPE OF THYROID CARCINOMA IN MANGUSADA HOSPITAL

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ABSTRACT

Background: Thyroid carcinoma is an endocrine malignancy of the thyroid gland with a high rate in Indonesia. Many studies have found that age and gender affect the prognosis of thyroid carcinoma. This study aimed to determine the relationship between age and gender with the histopathological type of thyroid carcinoma. **Methods:** Samples were collected from histopathological examinations of thyroid carcinoma in the Anatomical Pathology Laboratory from January 1, 2022 to December 31, 2023. A statistical test was used to determine the relationship between age and gender with histopathological type of thyroid carcinoma. **Results:** There were 33 thyroid carcinoma patients in Mangusada Hospital during 2022-2023 with the highest number in the 40-49 years (12 patients/36.4%). Cases were dominated by women (27 patients, or 81.8%) with a male-to-female ratio of 1:4.5. Papillary thyroid carcinoma was the most common type (32 patients/97%), followed by follicular thyroid carcinoma (1 patient/3%). The Kruskal-Wallis test showed that the p-value of age was 0.158, and the Fisher's Exact test showed that the p-value of gender was 1.000. **Conclusion:** Both age and gender had no significant relationship with the histopathological type of thyroid carcinoma.

Keywords: age., gender., histopathological type of thyroid carcinoma

INTRODUCTION

Thyroid carcinoma is an endocrine cancer that occurs in the thyroid gland, with 586,000 cases worldwide. It is the ninth position of the most common cause of cancer in 2020.¹ In Indonesia, the mortality rate of thyroid carcinoma patients per 100,000 population has increased to 36.4% since 1990.²

The high number of patients with thyroid carcinoma can be influenced by age and gender.³ A study in Gorontalo showed that thyroid neoplasms occurred mostly at 36-45 years, as many as 25.9%.⁴ While other studies mention that the peak of thyroid carcinoma cases occurs at the age of 30-40 years.⁵ Although the case is uncommon, thyroid carcinoma can also occur in children and adolescents with only 2.4%.^{6,7} Factors that can cause thyroid carcinoma in children and adolescents include age, history of radiation exposure to the head and neck area, and family history of thyroid cancer.⁸

Based on gender, the distribution of cases is more prevalent in women, with a total of 77.6%.⁴ A study in Sudan found the cause of the high number of thyroid carcinoma patients in women was because of the influence of estrogen, and women performed thyroid gland examinations more often than men.¹

Based on histopathological type, papillary thyroid carcinoma (PTC) is the most common type, at around 40.1%.^{9,10} This is also supported by research from Samargandy, who found PTC to be the most common (88.07%) with significant results, especially in men aged 40-45 years, while PTC in women occurs at the age of 35-40 years and also showed significant results.⁹ Meanwhile, follicular thyroid carcinoma (FTC) was found at as much as 2.5%, anaplastic thyroid carcinoma (ATC) at as much as 0.46%, and medullary thyroid carcinoma (MTC) at as much as 0.6%.⁵ FTC in men occurred at 30-35 years, while in women it occurred at 35-40 years, but this result was not significant.¹¹ Research in Denpasar also found that PTC is the most common type (96.4%) and was dominated by women, with the highest age of 41-50 years and the lowest ≤ 20 years.¹² Other studies have also found that PTC is the most common type of thyroid carcinoma in children and adolescents (96.5%).^{8,13,14} Based on the results of previous studies, this study aims to determine the relationship between age and gender on the histopathological type of thyroid carcinoma.

THYROID CARCINOMA

Thyroid carcinoma originates from follicular cells or parafollicular cells.¹⁵ Most thyroid carcinomas

originate from follicular cells, which can be classified according to the 2022 WHO classification into papillary thyroid carcinoma (PTC), follicular thyroid carcinoma (FTC), and anaplastic thyroid carcinoma (ATC). Medullary thyroid carcinoma (MTC) is a parafollicular cell type of thyroid carcinoma.^{1,16,17} In PTC, a picture of the PTC nucleus can be found, including chromatin that is very finely dispersed and gives an optically clear appearance, so it is called ground glass or orphan Annie's eye, and the presence of concentric calcification structures called psammoma jirim.¹⁵ In FTC, relatively uniform cells are found and form small follicles. In ATC, anaplastic cells are generally found with pleomorphic and large data cells.¹⁵ In MTC, polygonal to spindle-shaped cells can be found that can form nests, trabeculae, and follicles.¹⁵

MATERIALS AND METHODS

This study is an observational analytic study with a cross-sectional design conducted at the Anatomical Pathology Department of Mangusada Hospital, Badung, Bali. The samples used in this study were secondary data obtained from archives of patient examination results diagnosed by histopathology at the Anatomical Pathology Laboratory of Mangusada Hospital from January 1, 2022, to December 31, 2023. Samples in this study were selected using total sampling methods that meet the inclusion and exclusion criteria. Inclusion criteria include complete and clear histopathology examination data on date of birth, gender, and specific thyroid carcinoma classification. Incomplete or damaged examination data will be excluded. This study has passed the research ethics test from the Health Research Ethics Commission of Mangusada Hospital with the number 070/0974/RSDM/2023.

In this study, age was expressed in 10-year intervals. The histopathological type of thyroid carcinoma was determined according to the WHO 2022 classification, which consists of 4 categories: papillary thyroid carcinoma, medullary thyroid carcinoma, follicular thyroid carcinoma, and anaplastic thyroid carcinoma. Furthermore, the data were analyzed descriptively, and hypothesis testing was carried out to find the relationship between the variables using IBM

SPSS Statistics version 26. In descriptive analysis, data on age, gender, and histopathological type of thyroid carcinoma were described in numbers and percentages. Then, the relationship between age and histopathological type was analyzed by the Kruskal-Wallis test, while finding the relationship between gender and histopathological type was analyzed by the Fisher's Exact test with a significance value of $p < 0.05$.

RESULTS

This study found that 33 patients with thyroid carcinoma were diagnosed histopathologically by the Anatomical Pathology Department of Mangusada Hospital from January 1, 2022, to December 31, 2023, and met the inclusion and exclusion criteria. Thyroid carcinoma occurs at various ages. The highest cases were dominated by patients aged 40-49 years (12 patients/36.4%), followed by 50-59 years (7 patients/21.2%). Meanwhile, the youngest case was found at the age of 19 years, while the oldest was found at the age of 79 years. The average age of patients in this study was 45.9 years, with a median of 48 years.

The gender variable showed that 6 men (18.2%) had thyroid carcinoma and 27 women (81.8%), with a ratio of 1:4.5. The average age of male patients in this study was 48.7 years, while the average age of female patients was 45.3 years.

Based on histopathological type, the diagnosis of thyroid carcinoma was dominated by PTC (32 patients/97%), followed by FTC (1 patient/3%). Of the 32 patients with a diagnosis of PTC, women dominated in this study (26/81.3%), while men amounted to 6 (18.7%) patients. In this study, there were no patients diagnosed with MTC or ATC.

To assess the relationship between age and the histopathological type of thyroid carcinoma, the Kruskal-Wallis test was used. In this study, the p-value was 0.158, so age did not show a significant relationship with the histopathological type of thyroid carcinoma. Meanwhile, for the gender variable, the Fisher's Exact test was used, and the p-value was 1.000, so the gender variable also did not show a significant relationship with the type of thyroid carcinoma.

Table 1. Characteristics of Subjects

Variable	Total (Percentage)
Age (Years)	
0-9	0 (0%)
10-19	1 (3%)
20-29	5 (15.2%)
30-39	2 (6.1%)
40-49	12 (36.4%)
50-59	7 (21.2%)
≥ 60	6 (18.2%)
Gender	
Male	6 (18.2%)
Female	27 (81.8%)
Histopathological Type	
Papillary Thyroid Carcinoma	32 (97%)
Follicular Thyroid Carcinoma	1 (3%)
Medullary Thyroid Carcinoma	0 (0%)
Anaplastic Thyroid Carcinoma	0 (0%)

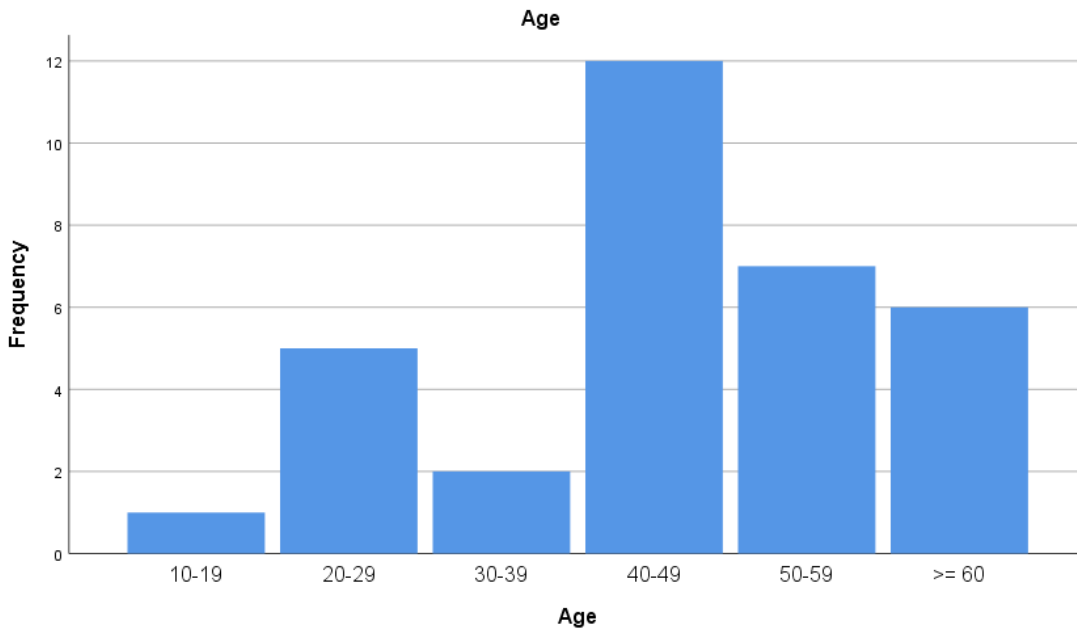


Fig. 1. Age distribution of thyroid carcinoma patients

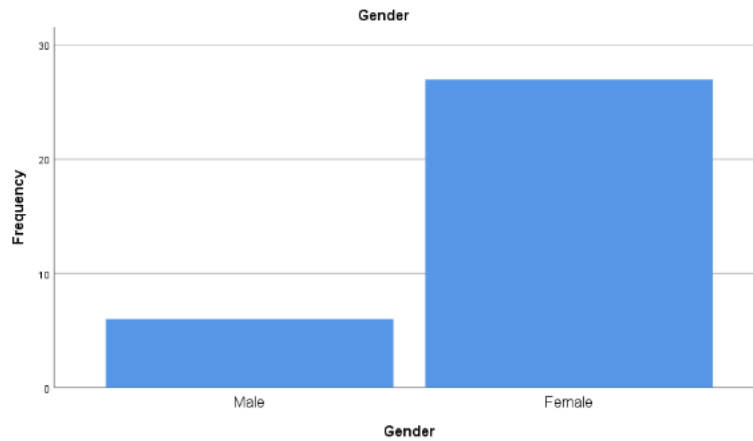


Fig. 2. Gender distribution of thyroid carcinoma patients

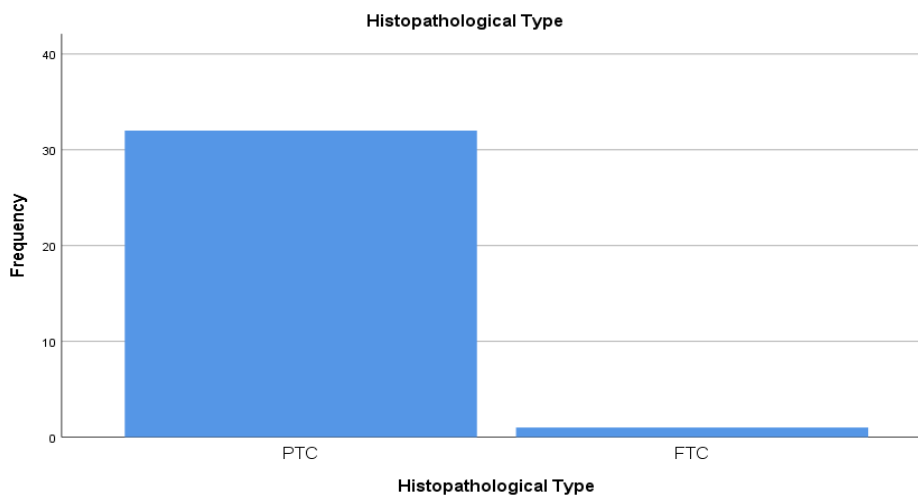


Fig. 3. Histopathological type of thyroid carcinoma

Table 2. Analysis of the relationship between age and gender with histopathological type of thyroid carcinoma

Variable	Histopathological Type				P
	PTC	FTC	MTC	ATC	
Age (Years)					0.158 ^a
0 – 9	0	0	0	0	
10 – 19	1	0	0	0	
20 – 29	4	1	0	0	
30 – 39	2	0	0	0	
40 – 49	12	0	0	0	
50 – 59	7	0	0	0	
≥ 60	6	0	0	0	
Gender					1.000 ^b
Male	6	0	0	0	
Female	26	1	0	0	

α = Kruskal – Wallis test; β = Fisher's Exact test

DISCUSSION

This research is a cross-sectional study that aims to determine the relationship between age and gender with the histopathological type of thyroid carcinoma. The data were collected from the examination archives of patients with thyroid carcinoma who were diagnosed by histopathology from 1st January 2022 to 31st December 2023.

Based on the study in Gorontalo, thyroid carcinoma cases were dominated by the age of 36-45 years.⁴ But another study found that the age of 30-40 years was the highest age for thyroid carcinoma.¹⁸ This is in line with the result of this study, which shows that patients with thyroid carcinoma in this study are dominated by the age of 40-49 years. The results of this study are also supported by the research in Iraq, which showed that the highest age of thyroid carcinoma was in the range of 25-44 years.¹⁸

Based on gender, thyroid carcinoma patients are dominated by women, with 77.6% of cases.⁴ Research in Turkey found that the ratio of thyroid carcinoma patients in men compared to women was 1:3.8.¹⁹ This is in line with the results of this study, where the ratio of men and women was 1:4.5. This suggests that thyroid carcinoma is consistently more prevalent in women than men.

Based on histopathological type, PTC is the most common type of thyroid carcinoma.^{7,8} Meanwhile, research in Padang also found PTC as the highest case at 83.5%, followed by FTC (8.5%), MTC (3.2%), and ATC (4.2%).²⁰ This is similar to the results of this study, which showed that PTC was the most common type (32 patients/97%). A study found that PTC was the most common type (88.07%) with significant results, especially in men aged 40-45 years, while PTC in women occurred at 35-40 years and showed significant results.¹¹ In contrast to the results of this study, age and gender characteristics did not show a significant relationship with the type of thyroid carcinoma. However, this study is supported by a study in Iraq that did not show a significant relationship between age and gender with the type of thyroid carcinoma.¹⁰

CONCLUSION AND SUGGESTION

From January 1, 2022, to December 31, 2023, 33 patients had thyroid carcinoma. PTC was the most common type of thyroid carcinoma that was found in this study between the ages of 40 and 49 years and was dominated by women. However, in this study, age and gender did not show a significant relationship with the histopathological type of thyroid carcinoma. Thus, further research is needed using a larger sample size and a longer period.

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