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Characteristics of Thyroid Carcinoma Patients in the Inpatient Department of Dr. Mohammad Hoesin General Hospital from January 2020 to December 2022

Amira Azra Arisa Putri [1], Bima Indra [1*], Nur Qodir [2]

[1] Faculty of Medicine, University of Sriwijaya, Palembang, Indonesia

[2] Department of Surgery, Mohammad Hoesin General Hospital/Faculty of Medicine, University of Sriwijaya, Palembang, Indonesia

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*Corresponding Author:
Bima Indra
Faculty of Medicine, University of Sriwijaya, Palembang, Indonesia
bimaindra26@gmail.com

ABSTRACT

Background: Thyroid carcinoma is the most common endocrine malignancy with a rising prevalence. Understanding patients' sociodemographic characteristics is crucial for improving diagnosis and management. This study aims to provide information about the characteristics of thyroid carcinoma patients.

Method: This cross-sectional study analyzed medical records of patients diagnosed with thyroid carcinoma in the Inpatient Department of Dr. Mohammad Hoesin General Hospital, from January 2020 to December 2022. Data collected included age, gender, residence location, main complaints, histopathological variant, disease stage at diagnosis, past medical history, family history, radiation exposure, and type of surgical intervention.

Results: Most patients were aged 50-59 years (26.1%) and female (78.3%). The majority came from lowland (90.6%) and rural areas (64.5%). The most common main complaint was a neck lump (63.0%). Papillary thyroid carcinoma was the most frequent variant (87.7%). Most patients were diagnosed at stage I (37.7%), and most patients underwent total thyroidectomy (84.1%). The most common past medical condition was goiter (76.8%). Additionally, 93.5% of patients had no family history of malignancy, and none had radiation exposure.

Conclusion: Thyroid carcinoma patients at Mohammad Hoesin General Hospital are predominantly females aged 50-59 from lowland and rural areas. Most were diagnosed with Papillary Thyroid Carcinoma at the early stages and underwent total thyroidectomy.

INTRODUCTION

Thyroid cancer is the most common endocrine malignancy. According to the Global Cancer Observatory (GLOBOCAN) 2024, thyroid cancer accounts for 9.1% of the total cancer incidence in 2024, with an incidence rate of 10.1 per 100,000 women and 3.1 per 100,000 men [1]. The incidence of thyroid cancer increases by approximately 7% each year, a rate faster than that of other solid cancers [2,3]. In Indonesia, thyroid cancer ranks as the sixth most common cancer at the Dharmais Cancer Hospital from 2010 to 2013 [3]. Data from the Indonesian Society of Pathologists indicates that thyroid cancer is the ninth most common cancer in Indonesia, accounting for 4.43% of all cancers and being the most frequent endocrine malignancy [2].

A study in 2016 at Mohammad Hoesin General Hospital, Palembang, reported 61 thyroid cancer cases (52.5%) between January and December. The study revealed that 83.6% of the patients were female (51 patients), while 16.4% were male (10 patients), with a female-to-male ratio of 5:1 [4]. Another study by Ditamor [5] in 2020 identified 95 thyroid cancer patients, with 32.6% aged between 48 and 56 years, the majority being female (82.1%), and 85.3% residing in lowland areas.

Thyroid cancer contributes to 10-30% of all thyroid nodules, predominantly affecting women. The malignancy incidence in single thyroid nodules is around 5-12%, while it is 3% in multiple nodules. Thyroid cancer most frequently occurs in women and typically affects those aged between 20 and 50 years [5]. The objective of this study is to identify and provide information on the characteristics of thyroid malignancies based on patient sociodemographic and risk factors in the inpatient unit of Mohammad Hoesin General Hospital, Palembang.

METHODS

This study is descriptive observational research with a cross-sectional study design. The sample consists of medical record data of thyroid cancer patients hospitalized in the inpatient department of Dr. Mohammad Hoesin General Hospital, Palembang, from January 2020 to December 2022. Inclusion criteria include all medical records of patients diagnosed with thyroid cancer confirmed by anatomical pathology examination. Exclusion criteria are medical records of patients with clinical symptoms but undiagnosed or suspected thyroid cancer, and incomplete data.

Data collected in this study include age, gender, residence location (lowland if the altitude is 0–200 meters above sea level, and highland if the geographical location is at an altitude of 200–1500 meters above sea level), main complaints, histological variant, stage at diagnosis, history of previous thyroid disease, family history of malignancy, history of radiation exposure, and surgical treatment received. Data were processed using Microsoft Excel 365. Both categorical and numerical data are presented descriptively.

RESULTS

Univariate analysis in **Table 1** indicates that most thyroid carcinoma patients were aged 50–59 years (26.1%) and 30–39 years (20.3%). The predominant gender among thyroid carcinoma patients at Dr. Mohammad Hoesin General Hospital was female, accounting for 78.3% (20 patients). most thyroid carcinoma patients originated from lowland (coastal) areas, with 125 patients (90.6%), whereas only 13 patients (9.4%) came from highland (mountainous) regions. Most patients resided in rural areas (64.5%).

According to **Table 2**, the primary complaint of most thyroid carcinoma patients (63.0%) was a neck lump. Additionally, neck pain was the main complaint for 20 patients (14.5%). Difficulty swallowing and voice changes were reported by 8 patients (5.8%) and 7 patients (5.1%), respectively. The most common histological variant among the patients was papillary thyroid carcinoma (PTC), found in 121 patients (87.7%), followed by follicular thyroid carcinoma (FTC) in 19 patients (11.6%), and Hürthle cell

Table 1. The sociodemographic background

Variables	Sample (N = 138)	
	N	%
Age (years)		
20–29	20	14.5
30–39	28	20.3
40–49	22	15.9
50–59	36	26.1
60–69	25	18.1
70–80	7	5.1
Sex		
Male	30	21.7
Female	108	78.3
Living Area Terrain		
Lowland	125	90.6
Highland	13	9.4
Geographic location		
Urban	49	35.5
Rural	89	64.5

Table 2. The characteristics of thyroid carcinoma

Variables	Sample (N = 138)	
	N	%
Main complain		
Neck lump	87	63.0
Neck pain	20	14.5
Change in voice	7	5.1
Dysphagia	8	5.8
Dyspnea	16	11.6
Type of thyroid carcinoma		
Papillary thyroid carcinoma	121	87.7
Follicular thyroid carcinoma	16	11.6
Hurthle cell carcinoma	1	0.7
Stage at diagnosis		
I	52	37.7
II	40	29.0
III	15	10.9
IVa	11	8.0
IVb	20	14.5
Management		
Total thyroidectomy	116	84.1
Total lobectomy	22	15.9

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Table 3. Medical history related to thyroid carcinoma

Variables	Sample (N = 138)	
	N	%
History of thyroid disease		
Hyperthyroid	22	15.9
Goiter	106	76.8
Chronic thyroiditis	10	7.2
Family history of malignancy		
Present	9	6.5
Absent	129	93.5
Exposure to radiation history		
Present	0	0
Absent	138	100

(oncocytic) tumor in 1 patient (0.7%). The staging of thyroid carcinoma at diagnosis showed that most patients were diagnosed at stage I (37.7%), followed by stage II (29.05%) and stage IVb (14.5%). Our study demonstrates that most patients (84.1%) underwent total thyroidectomy, with 116 patients having this procedure, whereas 22 patients (15.9%) had a lobectomy (hemithyroidectomy/ isthmolobectomy).

Table 3 indicates that the most prevalent prior thyroid disease among patients was goiter, present in 106 patients (76.8%). The second most common was hyperthyroidism in 22 patients (15.9%), with chronic thyroiditis being the least common in 10 patients (7.2%). Based on family history, 129 patients (93.5%) had no family history of malignancy, while 9 patients (6.5%) did have a family history of cancer. None of the 138 patients had a history of radiation exposure.

DISCUSSION

The results of this study indicate that out of 138 respondents, 36 patients (26.1%) were aged between 50–59 years, and 28 patients (20.3%) were aged between 30–39 years. Research by Saputri et al. [6] conducted at a hospital in Bandung showed that patients with thyroid nodules ranged from adulthood to old age. This is because immunity and body endurance decrease with age, along with an increased need for iodine. As age increases, the production of thyroxine hormone by the thyroid gland decreases, causing the gland to work harder to produce hormones. A deficiency in thyroxine hormone can cause the anterior pituitary gland to secrete thyroid-stimulating hormone (TSH) excessively, leading to the enlargement of the thyroid gland due to increased secretion of thyroglobulin into the follicles [6].

The majority of thyroid carcinoma patients in this study were female (78.3%). This aligns with other research, where out of 72 patients with thyroid nodules, the majority were female (90%) [6]. This suggests the involvement of hormonal factors. Estrogen can increase levels of Thyroid Binding Globulin (TBG), which transports T4 and T3 in the blood, leading to a decrease in free T4 and T3 levels. This stimulates TSH, causing glandular hyperplasia as a compensatory mechanism to produce more thyroid hormones, restoring serum T4 and T3 levels. Studies also show that biological changes during pregnancy can increase the risk of thyroid cancer [7].

The frequency distribution of thyroid carcinoma patients based on residence showed that 125 patients (90.6%) lived in lowland (coastal) areas, while only 13 patients (9.4%) lived in highland (mountainous) areas. Another study also supports our finding on the characteristics of thyroid cancer patients at the oncology surgery department of DR. H. Abdul Moeloek General Hospital in Lampung Province, which found that most patients did not live in mountainous areas [8]. Coastal cities with thyroid nodule cases are areas near the sea. Although coastal areas have high natural iodine content from seafood, groundwater also serves as a source of natural iodine. Coastal endemic areas experiencing soil erosion due to seawater have low iodine content in groundwater, resulting in endemic goiter regions [9].

In this study, the main complaint of most thyroid carcinoma patients was neck lumps, reported by 87 patients (63.0%), followed by neck pain, difficulty breathing, difficulty swallowing, and voice changes. These findings are consistent with other research in 2023, which found that the main complaint of most thyroid carcinoma patients was lumps (83.45%) [10]. Thyroid nodules are typically asymptomatic when first discovered. Patients with thyroid nodules often seek medical advice due to cosmetic concerns or anxiety about malignancy. A small number of patients with large nodules report mechanical symptoms such as a choking sensation in the esophagus (dysphagia) or trachea (shortness of breath). These pressure symptoms are also noted in chronic thyroiditis due to its hard consistency. Pain is typically absent unless there is hemorrhage within the nodule. Thyroid malignancy infiltrating the recurrent laryngeal nerve can cause hoarseness. Patients may also present with lateral upper neck lumps that are metastatic thyroid carcinoma in lymph nodes, with the primary tumor being relatively small. Some patients may also present with lumps on the head, which are metastatic thyroid carcinoma in the cranium [11].

This study identified three variants of thyroid carcinoma, with papillary thyroid carcinoma (PTC) being the most common, affecting 121 patients (87.7%), followed by follicular thyroid carcinoma (FTC) affecting 19 patients (11.6%), and Hürthle cell (oncocytic) tumor affecting 1 patient (0.7%). Another study also reported papillary thyroid carcinoma in 60-85% of cases, follicular carcinoma in 10–27.5%, medullary carcinoma in 3–10%,

and anaplastic carcinoma in 3-8%. Papillary thyroid carcinoma is of particular interest to researchers due to its high incidence compared to other types [12]. Papillary thyroid carcinoma accounts for 85–90% of all thyroid cancer cases, while follicular thyroid carcinoma accounts for only 2–5%. Follicular carcinoma is more aggressive than papillary carcinoma due to its ability to invade the vascular system [13]. A study in 2017 also stated that estrogen receptors are found in the thyroid gland. Papillary thyroid carcinoma has the highest content of estrogen and progesterone receptors compared to other types of thyroid carcinoma [14].

Most thyroid carcinoma patients in this study were in stage I (37.7%), followed by stage II (29.0%), stage IVb (14.5%), stage III (10.9%), and the least in stage IVa (8.0%). Other research also found that 38% of 141 thyroid cancer patients at the Oncology Hospital in Surabaya were in stage I [15]. Rego-Iraeta et al. [16] found that papillary thyroid carcinoma (PTC) was most common in stage I (63%), while follicular carcinoma was also most common in stage I (37.5%). This study similarly found that most DTC patients were in stage I (62.8%), with no stage IVC patients. This could be due to the incidental discovery of small thyroid cancers, known as thyroid incidentaloma, after surgery for solitary or multinodular goiter [17].

The most common previous disease among patients was goiter (76.8%), followed by hyperthyroidism (76.8%), and chronic thyroiditis (7.2%). Goiter causes hyperplasia, leading to single or multiple nodules, and is believed to increase the incidence of thyroid carcinoma by 2.5 times. PTC is more common in iodine-sufficient areas because high thyroxine levels from iodine intake can cause follicular hyperplasia. Flat epithelium and increased colloid in cells result in goiter, leading to thyroid abnormalities and point mutations in the B-rapidly accelerated fibrosarcoma protein (BRAF) gene, triggering papillary thyroid carcinoma [18].

In this study, 129 patients (93.5%) reported no family history of malignancy, while 9 patients (6.5%) did. The American Thyroid Association (ATA) explains that most thyroid carcinoma cases affect only one individual in a family without a family history of thyroid malignancy. Therefore, according to ATA, if a family has no history of thyroid cancer, there is no significant influence on the occurrence of papillary thyroid carcinoma in other family members, except due to other factors such as radiation or environmental factors [19]. This aligns with other studies, which found that only 4 out of 188 papillary thyroid carcinoma patients had a family history of cancer [20].

All 138 patients (100%) in this study had no history of radiation exposure. Thyroid carcinoma caused by radiation exposure depends on factors such as radiation dose, age at exposure, and iodine deficiency. High radiation doses can cause genetic mutations leading to thyroid carcinoma. Thus, radiation exposure can influence thyroid carcinoma incidence if the dose is high; otherwise, its impact is negligible [21].

Regarding treatment, most patients underwent total thyroidectomy (84.1%), followed by total lobectomy (hemi/ismolobectomy) (15.9%). This is consistent with other research on the clinicopathological characteristics of thyroid carcinoma at Dr. M. Djamil Hospital, Padang, where 68.30% of patients underwent total thyroidectomy [10]. The American Thyroid Association and the International Federation of Head and Neck Oncologic Societies recommend lobectomy only for low-risk cases, while total thyroidectomy is advised for medium and high-risk cases to ensure adequate local control and facilitate post-operative evaluation, reducing recurrence rates [19]. Total thyroidectomy offers several benefits, including effective treatment for multiple nodules, easier monitoring of tumor progression post-surgery, and optimal post-operative care with radioiodine. This procedure also reduces the risk of tumor recurrence and the need for reoperation, minimizing the risk of serious complications [10].

This study has significant strengths, providing a comprehensive overview of thyroid carcinoma patients' characteristics at Dr. Mohammad Hoesin Hospital. It covers various sociodemographic aspects and risk factors, including age, gender, residence location, main complaints, carcinoma variants, stage at diagnosis, previous diseases, family history, radiation exposure, and surgical treatment. This offers an in-depth understanding of thyroid carcinoma patients' characteristics.

However, the study also has limitations. It uses a cross-sectional design, which may limit data validity due to reliance on available medical records. The study was conducted at a single hospital, making it challenging to generalize the findings to a broader population. The descriptive explanation limits the determination of thyroid carcinoma risk factors. Additionally, the absence of data on other contributing factors such as diet, lifestyle, or environmental exposure is a significant limitation. The study also lacks analysis of treatment effectiveness or patient survival, which could provide additional insights into clinical outcomes for various thyroid carcinoma variants and stages. Another limitation is the lack of radiation exposure data verification, despite all patients reportedly having no radiation history. Overall, despite these limitations, the study's primary strength lies in its extensive data coverage and detailed analysis of thyroid carcinoma patients' characteristics at RSUP Dr. Mohammad Hoesin. This research contributes significantly to understanding thyroid carcinoma epidemiology in this region and can serve as a foundation for broader, more in-depth future studies.

CONCLUSIONS

The majority of thyroid carcinoma patients are aged 50-59 years, female, residing in lowland and rural areas. The most common main complaint is a neck lump, with the most frequent variant being papillary thyroid carcinoma, and most patients are diagnosed at stage I. Nearly all patients had a previous condition of goiter; however, most did not have a family history of malignancy, and none had a history of radiation exposure. In terms of management, most patients underwent total thyroidectomy.

DECLARATIONS

Competing interest

The author(s) declare no competing interest in this study

Ethics approval and consent to participate

This study has received ethical approval from the Ethics Committee of Dr. Mohammad Hoesin General Hospital (No. 77/keprsmh/2022). As this study involved the analysis of existing medical records and did not require direct patient contact, the requirement for informed consent was waived by the ethics committee of Dr. Mohammad Hoesin General Hospital. Patient confidentiality and privacy were strictly maintained throughout the study. All data were anonymized to ensure that individual patients could not be identified.

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