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CHARACTERISTICS OF NASOPHARYNGEAL CARCINOMA PATIENTS AT THE OTORHINOLARYNGOLOGY POLYCLINIC OF NGOERAH HOSPITAL IN 2023-2024

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ABSTRACT

Background: Nasopharyngeal carcinoma (NPC) is a cancer or malignancy that located in the nasopharyngeal epithelial cells and ranks as the fourth of the most common cancer in Indonesia, with non-specific early symptoms that often lead to delayed diagnosis.
Methods: This retrospective cross-sectional descriptive aimed to determine the characteristics of NPC patients at Ngoerah Hospital Denpasar in 2023-2024. Using a total sampling technique on electronic medical records, 229 samples were obtained.
Results: The results showed that the patien were dominated by the male gender (73.4%) in the age range of 46-60 years (48.9%), and self-employed work (31.9%). Based on the risk factors, the majority of patients had no recorded history of smoking (68.6%) or family history of malignancy (93.4%). The most common histopathological type is *Undifferentiated Carcinoma* (92.6%). Most of the patients were diagnosed in the advanced stages, spesifically Stage IVA (40.2%) and IVB (35.8%), with the chief complaints were neck masses and headaches. It can be concluded that NPC patients at Ngoerah Hospital come from the adult age group (46-60 years) with male gender and from the self-employed group. The most common type of histopathology is *undifferentiated carcinoma*.
Conclusion: The high percentage of patients presenting at an advanced stage with the chief complaints of neck masses and headaches indicates a delay in early diagnosis of NPC. The findings of this research are expected to be used as a baseline for the future research.

Keywords: *Nasopharyngeal carcinoma, head and neck cancer, Ngoerah Hospital, characteristics, undifferentiated carcinoma.*

INTRODUCTION

Nasopharyngeal carcinoma (NPC) was a type of cancer of the head and neck region that ranked as the fourth most common cancer in Indonesia.[1] NPC affected the nasopharyngeal epithelium, specifically the squamous cells, and developed around the *Eustachian* tube on the lateral wall of the nasopharynx. [2] The cases of NPC were high in several regions, such as southern China and Asia because of its type of *Human Leucocyte Antigen* (HLA).

Males had a three times higher risk of being affected by NPC compared to females, with peak incidence that occurred in the 45-60 age group.[3] The high incidence of NPC was associated with *Epstein-Barr* virus infection, combined with environmental factors and a family history of malignancy.[4] This malignancy did not show specific symptoms in early stages, so patients were often diagnosed at advanced stages. Patients usually presented with neck mass, headache, epistaxis, or diplopia, which were signs of the advanced stage of NPC. [5]

Given the enormous challenge of NPC, early detection and prevention were considered crucial to overcome the disease. To achieve this, data reporting the cases and characteristics of NPC in each hospital were required. Ngoerah Hospital was the largest referral hospital in Bali, the

patients are from all regions of Bali and Nusa Tenggara. However, it lacked routine reports on NPC patient characteristics. Therefore, this study was conducted to determine the characteristics of NPC patients at Ngoerah Hospital, intended to serve as a resource for future research.

MATERIAL AND METHODS

This research was a descriptive study with a cross-sectional design. Data collection was carried out retrospectively. The study population consisted of all NPC patients who presented for treatment at Ngoerah Hospital from January 2023 to December 2024.

The variables studied included gender, age, occupation, histopathological stage, clinical stage, smoking history, family history of malignancy, chief complaints. Patients were included if they had complete medical records. Patients were excluded if their data were incomplete, or if they presented with recurrent NPC or came to continue therapy (chemotherapy/radiotherapy). The data has been collected from the electronic medical records database *SIMARS*, then converted into the *excel* format using Microsoft Excel, and processed into percentages by SPSS VER.27 software.

The final data were presented as percentages described using narratives and tables. This study received ethical clearance from the Research Ethics Commission of the Faculty of Medicine, Udayana University, with the ethical clearance number is No:0592/UN14.2.2.VII.14/LT/2025. Research permission was also obtained from Ngoerah Hospital with the number of it permission is No: DP.04.03/D.XVII.2.2.2/40872/2025.

RESULTS

Based on the data collection, 255 cases of NPC were identified, but only 229 patients met the inclusion criteria. From that data, it was found that the age range with the highest number of cases was 46-60 years, accounted for 112 cases (48.9%), followed by the 31-45 ager group with 50 cases (21.8%). The lowest number of cases occurred in the 1-15 age range, with onlyy 2 cases (0.9%). Detailed are presented in **Table 1.**

Table 1. Distribution of NPC Patients based on age

Age Range (years)	Frequency	%
1-15	2	0.9
16-30	11	4.8
31-45	50	21.8
46-60	112	48.9
60-75	49	21.4
>75	5	2.2

Based on gender, the NPC patients at Ngoerah Hospital comprised 168 patients (73.4%) were males and 61 patients (26.6%) were females. Consequently, a male predominance was observed among the patients. The specific distribution is detailed in **Table 2.**

Table 2. Distribution of NPC Patients based on gender

Gender	Frequency	%
Male	168	73.4
Female	61	26.6

Based on occupation, the largest group of NPC patients came from the self-employed sector, totaling 73 patients (31.9%), followed by farmers with 63 patients (27.5%). The smallest data group was found among the unemployed, with only 2 patients (0.9%). Presentation of more detailed data related to the results of the type of occupation in NPC patients can be seen in the table below or **Table 3.** The others occupation were doctor, students, construction laborers, and soldier.

Table 3. Distribution of NPC Patients based on occupation

Occupation	Frequency	%
Self-employed	73	31.9
Private employees	42	18.3
Farmer	63	27.5
Government employees	11	4.8
Housewife	29	12.7
Unemployed	2	0.9
Others	9	3.9

Based on risk factors, this study assessed the presence of smoking history and a family history of malignancy. As shown in **Table 4**, out of the total 229 NPC patients, 157 patients (68.6%) reported no history of smoking, while 72 patients (31.4%) did have a smoking history.

Regarding the family history of malignancy, the results showed that 214 patients (93.4%) had no family history of malignancy, with only 15 patients (6.6%) reporting a family history of malignancy. The distribution is detailed in **Table 4.**

Table 4. Distribution of NPC Patients based on Risk Factors.

Risk Factors	Frequency	%
Smoking History		
No	157	68.6
Yes	72	31.4
Family History of Malignancy		
No	214	93.4
Yes	15	6.6

Table 5 presents the distribution data of NPC patients based on their histological type. Out of the 229 study samples, the most frequently observed NPC type, based on anatomical histopathology or biopsy results, was the Undifferentiated Carcinoma, accounting for 212 patients (92.6%). The least common type found was the Keratinizing Squamous Cell Carcinoma, with 3 cases (1.3%).

Table 5. Distribution of NPC Patients based on Histological Type

Histological type	Frequency	%
Keratinizing Squamous Cell Carcinoma	3	1.3
Non-Keratinizing Squamous Cell Carcinoma	14	6.1
Undifferentiated Carcinoma	212	92.6

Nasopharyngeal Carcinoma (NPC) staging was categorized according to AJCC 8, which included stages I, II, III, IVA, and IVB. Bases on this staging system, the majority of NPC patients at Ngoerah Hospital were diagnosed with advanced stages, stage IVA comprising 92 patients (40.2%), and stage IVB with 82 patients (35.8%). The least frequent diagnosis was on Stage I, recorded in only 1 patient (4.0%). The specific distribution is detailed in **Table 6.**

Table 6. Distribution of NPC patients based on the stage

Stage	Frequency	%
I	1	4.0
II	6	2.6
III	48	20.5
IVA	92	40.2
IVB	82	35.8

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NPC patients came to the hospital with various chief complaints, which were generally non-specific. Among the 229 NPC patients at Ngoerah Hospital, the most frequently reported symptom was neck mass, experienced by 172 patients (75.1%). The next complaints were headaches, reported by 128 patients (55.9%), and epistaxis or nosebleeds that reported by 91 patients (39.7%). The least common symptom experienced by NPC patients at Ngoerah Hospital was exophthalmos, which was reported by only 2 patients (0.9%). The specific distribution is detailed in **Table 7.**

Table 7. Distribution of NPC patients based on the chief complaints

Chief complaints	Frequency	%
Nasopharyngeal symptoms		
Epistaxis	91	39.7
Nasal congestion	73	31.9
Nose discharge	4	3.1
Lumps on the nose	7	1.7
Symptoms of Superior Extension		
Headache	128	55.9
Facial weakness/pain	20	8.7
Blurred vision	8	3.5
Diplopia	32	14.0
Exophthalmos	2	0.9
Symptoms of Lateroposterior Extension		
Tinnitus	90	39.3
Decreased hearing	72	31.4
Neck Mass Symptoms		
Neck lump	172	75.1
Dysphagia	28	12.2
Chief complaints	Frequency	%
Other Symptoms		
Ear discharge	12	5.2
Weight loss	15	6.6
Decreased appetite	5	2.2
Nausea	12	5.2
Shortness of breath	5	2.2

DISCUSSION

Age

The highest prevalence of NPC patients at Ngoerah Hospital was observed in the 46–60 age group, comprising 112 patients (48.9%), whereas the lowest incidence was recorded in the 1–15 age range, with only 2 patients (0.9%).. This finding is consistent with another study conducted at Ngoerah Hospital from 2016 to 2020, which demonstrated a predominance of NPC cases among patients aged 41-50 and 61-70 years.[6] Similar results were also reported that the highest prevalence of NPC patients occurred in the 41-50 and 51-60 age groups.[5] Furthermore, a study in 2013 explained that the incidence of NPC peaked at 55-59 years due to exposure to risk factors and age-associated decline in immune function.[7] Other studies have documented minimal incidence rates among individuals under 30 and under 20 years of age.[6,7]

Age represents a primary risk factor in the carcinogenesis of malignancies. With advancing age, the body undergoes a cascade of biological and molecular alterations that increase the susceptibility of normal cells to malignant transformation, primarily driven by DNA mutations. In individuals exceeding 40 years of age, the efficacy of DNA repair mechanisms and immune surveillance notably declines. This physiological deterioration facilitates the progression of cellular mutations into uncontrolled, proliferative cell growth. When these pathological changes occur within the cuboidal epithelium of the Fossa of Rosenmüller, particularly in conjunction with Epstein-Barr virus (EBV) infection, they may precipitate the development of nasopharyngeal carcinoma (NPC).[8,9]

Gender

Regarding sex distribution, a male predominance was observed, with 168 male patients (73.4%) compared to 61 female patients (26.6%). This finding is consistent with studies conducted in Bali Province (Mangusada Hospital) and South Sumatra Province (Dr. Mohammad Hoesin

Hospital, Palembang), which similarly reported that the NPC patient population is dominated by males.[10,11] This disparity is likely associated with general differences in lifestyle patterns between the sexes, particularly the higher prevalence of smoking and occupational exposure to chemical agents among males compared to females. Furthermore, endogenous estrogen activity in females contributes to a protective effect against NPC. Estrogen is known to mediate the inhibition of inflammatory responses associated with carcinogenesis. The activation of intracellular estrogen receptors by the hormone can modulate the expression of specific genes controlling NPC progression; this is evidenced by the detection of estrogen receptors within NPC tissues. The relationship between estrogen and NPC is further corroborated by the role of NAG7, a tumor suppressor gene, the protein product of which functions to suppress or negatively regulate cancer cell proliferation. Estrogen, acting through its receptors, is capable of upregulating the activity of tumor suppressor genes such as NAG7.[7]

Occupation

In terms of occupational background, the highest prevalence of NPC was observed among self-employed individuals, comprising 73 patients (31.9%), whereas the lowest prevalence was recorded in the unemployed group, with only 2 patients (0.9%). This finding contrasts with other studies on nasopharyngeal carcinoma, which reported the highest incidence among private employees.[5,12] This discrepancy is hypothesized to stem from differing classification criteria regarding "self-employed" versus "private employees" categories. In the current study, the self-employed category encompasses a broad spectrum of occupations, such as mechanic/garage owners, parking attendants, and fishermen. These occupations likely involve prolonged exposure to significant risk factors. Conversely, the private sector employee category referenced in other studies may include high-risk roles, such as textile or wood processing factory workers, who are similarly subjected to substantial exposure to risk factors. Another potential explanation relates to demographic variations in the labor market between Bali and other regions. Furthermore, hospital selection bias may contribute to this inconsistency; private sector employees with health insurance coverage may preferentially seek treatment at specific institutions, thereby inflating the recorded frequency of this occupational group among NPC patients at those facilities.

Histopathological type

In patients treated at Ngoerah Hospital, Undifferentiated Carcinoma emerged as the predominant histopathological subtype of Nasopharyngeal Carcinoma (NPC), comprising 212 patients (92.6%). Non-Keratinizing Squamous Cell Carcinoma followed with 14 patients (6.1%), whereas Keratinizing Squamous Cell Carcinoma was the least frequently observed, totaling only 3 patients (1.3%). These data align with prior research, which similarly identified Undifferentiated Carcinoma as the most common subtype.[12,13]

The prevalence of specific NPC types is intrinsically linked to the Human Leukocyte Antigen (HLA) characteristics of specific ethnic groups. HLA modulates the body's immune response to the Epstein-Barr Virus (EBV), the primary oncogenic factor in NPC. Significant correlations have been established between Class II HLA alleles and NPC susceptibility; notably, the HLA-DRB1*03 allele is associated with increased NPC incidence. While this allele is present in Asian and Tunisian populations, it is absent in Caucasians.[14] Consequently, variations in HLA allelic distribution explain the differential risk profiles for NPC observed across ethnicities, particularly distinguishing Asian populations from Caucasians.

Stage of NPC

Regarding disease staging, Stage IVA was the predominant presentation at Ngoerah Hospital, accounting for 92 patients (40.2%), followed by Stage IVB with 82 patients (35.8%). In contrast, Stage I was the least frequently encountered, represented by a single patient (0.4%). These data align with prior research, which also identified Stage IVA and IVB as the most common presentations, with early-stage (Stage I) cases being rare.[6,13]

Stages IVA and IVB represent locally advanced disease, which carries a poor prognosis and drives the persistently high mortality rates associated with NPC. The predominance of advanced-stage presentations is primarily driven by delayed diagnosis. This latency is due to the often asymptomatic or subtle nature of early-stage NPC, combined with insufficient public knowledge of the disease's symptoms. As a result, the majority of patients present clinically only upon the onset of severe symptoms, such as painful, enlarging neck masses indicative of T4 classification.

Smoking History

Of the 229 subjects included in this study, the majority were patients with no history of smoking, accounting for 157 patients (68.6%). Whereas those with a history of smoking were 72 patients (31.4%). These data align with another findings, which also reported a higher prevalence of non-smokers among NPC patients. The lack of a direct correlation is also reflected in a case-control study from South China, which demonstrated no significant association between smoking and NPC tumorigenesis.[15] Another study research posits that smoking influences the prognosis rather than the susceptibility to NPC.[16]

Conversely, there was a study that argue that smoking does increase NPC risk by playing a direct role in the activation of the Epstein-Barr Virus (EBV), the principal etiology of the disease.[17] Given these conflicting reports, the prevalence data of smokers versus non-smokers in the

present study should not be interpreted as definitive evidence regarding the relationship between smoking and NPC risk.

Family History of Malignancy

In this study, a family history of malignancy is defined as the presence of cancer among the patient's relatives. The results showed that 214 patients (93.4%) had no family history of malignancy, while the remaining 15 patients (6.6%) were known to have a positive family history of malignancy. This finding is consistent with previous research which also reported a higher proportion of NPC patients without a family history of malignancy.[18] Data regarding family history plays a crucial role in analyzing the risk of NPC.

Symptoms or Chief Complaints

The chief complaint refers to the primary symptom that leading a patient to seek medical consultation. Among NPC patients at Ngoerah Hospital, the most frequently reported chief complaint was a neck mass, observed in 172 patients. Other prevalent complaints included symptoms of superior extension, which indicate intracranial metastasis or advanced-stage disease; these included headache (128 patients) and diplopia (32 patients). Regarding nasopharyngeal symptoms, epistaxis was the most common (91 patients), followed by nasal obstruction (73 patients). Otologic manifestations were dominated by tinnitus (90 patients). These findings are consistent with another previous studies, which similarly identified neck mass, epistaxis, and nasal obstruction as the most common clinical presentations.[5,11,12]

The high prevalence of neck masses is attributable to the rich lymphatic drainage of the nasopharynx. The manifestation of this symptom is influenced by the anatomical location and histopathological characteristics of the primary tumor. NPC typically originates in the Fossa of Rosenmüller . This location often allows the tumor to grow without causing significant early nasopharyngeal symptoms, such as obstruction or epistaxis. However, given that the nasopharynx is surrounded by extensive lymphatic tissue, cancer cells can easily infiltrate the lymphatic plexus and disseminate along drainage pathways. Neck masses typically appear when the malignancy metastasizes to the lateral retropharyngeal and superior cervical lymph nodes, specifically the superior jugular nodes (Level II) located below the ear, and the posterior triangle nodes (Level V) located behind the sternocleidomastoid muscle.[19] This specific lymphatic drainage pattern explains why the palpable masses reported by patients are predominantly located in the upper neck or the posterior cervical region (around musculus sternocleidomastoideus).

CONCLUSION AND SUGGESTION

Based on this cross-sectional study of 229 Nasopharyngeal Carcinoma (NPC) patients treated at Ngoerah Hospital from January 2023 to December 2024, the patient profile was predominantly male (73.4%), aged 46–60 years (48.9%), and work as self-employeed. Clinically, the patients was characterized by a high prevalence of Undifferentiated Carcinoma (92.6%) and presented mostly at advanced stages (Stage IVA and IVB), with neck masses, headaches, and epistaxis being the most frequent chief complaints. Notably, the majority of patients reported no history of smoking (68.6%) or familial malignancy (93.4%). While this study provides a valuable update on the clinical profile of NPC in Ngoerah Hospital as the major referral hospital in Bali, its descriptive nature limits the ability to establish causal relationships between these risk factors and disease incidence.

To improve future outcomes and research quality, it is recommended that Ngoerah Hospital enhance the standardization and completeness of electronic medical records (SIMARS), particularly regarding environmental exposure and family history. Given the high prevalence of advanced-stage admissions, public health initiatives must prioritize massive education regarding early NPC symptoms, specifically painless, persistent neck masses. Furthermore, future researchers are encouraged to adopt analytic designs, such as case-control studies, and utilize primary data collection via standardized questionnaires to obtain more detailed insights into specific risk factors, including smoking habits, occupational carcinogen exposure, and EBV infection history.

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