

# Characteristics of patients with nasopharyngeal carcinoma in Dr. Soetomo General Academic Hospital Surabaya



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## ABSTRACT

**Background:** Nasopharyngeal carcinoma (NPC) is a malignant tumor in the nasopharynx with a high incidence of metastasis. NPC is one of the most common cancers in Indonesia, and from the age distribution, it often affects the productive age population. This study aims to describe the characteristics of NPC patients in Dr. Soetomo General Academic Hospital from January 2017 – December 2018.

**Methods:** This study is a retrospective descriptive by taking medical records of patients with NPC at Dr. Soetomo Hospital, Surabaya, from January 2017–December 2018, that meet the inclusion and exclusion criteria. The basic data taken are gender, age, education, and occupation. Complaints assessed are the main complaints of patients who make patients come for treatment listed in the medical record data.

**Results:** Data from 262 patients showed that the five-year life expectancy for NPC sufferers in women is 84%, while in men, it is 78%. The main complaints of patients in this study were lumps in the neck in 130 patients (49.61%), with the highest distribution of patients based on stage IV a with 78 patients (29.77%), and the majority were non-keratinizing carcinoma undifferentiated type, with a total of 245 patients (93.51%).

**Conclusion:** Male sufferers are more than females; the largest age group is 41-50. Most jobs are private employees, and most sufferers' last education is high school. The main complaint of most patients was a lump in the neck, and the patient came with an advanced stage where the most found was stage IV. The histopathological type of most patients is non-keratinizing carcinoma undifferentiated type.

**Keywords:** nasopharyngeal carcinoma, characteristics, disease.

**Cite This Article:** Utomo, A.W., Romdhoni, A.C. 2023. Characteristics of patients with nasopharyngeal carcinoma in Dr. Soetomo General Academic Hospital Surabaya. *Bali Medical Journal* 12(2): 1589-1593. DOI: 10.15562/bmj.v12i2.4228

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Received: 2023-03-02  
Accepted: 2023-04-25  
Published: 2023-05-11

## INTRODUCTION

Cancer is the leading cause of death in developing countries and the second leading cause of death in developed countries. The high incidence of cancer in developing countries results from the population's increasing age and lifestyle changes, such as smoking habits, lack of physical activity, and poor diet. The increase in cancer incidence worldwide from 2008 to 2013 is about 12.7 million.<sup>1,2</sup>

The incidence of head and neck tumors varies widely. More than 500,000 cases worldwide, with a mortality rate of 270,000 per year, generally occurring in developing countries.<sup>1,2</sup> In Europe and the United States, head and neck tumors are rare malignancies, with a prevalence of 5-10% of all tumors, while in other countries, such as India, the prevalence reaches 45%.<sup>2,3</sup> Nearly 60% of malignant

head and neck tumors are nasopharyngeal carcinoma (NPC), followed by sinonasal carcinoma (18%), larynx (16%), and a low percentage of malignant tumors of the oral cavity, tonsils, and hypopharynx. NPC ranks fourth of all malignancies after cervical, breast, and lung cancer.<sup>4</sup>

NPC is a malignant nasopharynx tumor with a high metastasis incidence.<sup>5-7</sup> The mucosa of the nasopharyngeal wall consists of pseudo-columnar squamous epithelium associated with lymphoepithelial tissue in the nasopharynx.<sup>3</sup> The mucosa covering the walls of the nasopharynx histologically consists of pseudo-columnar squamous epithelium associated with submucosal lymphoid stroma and seromucous glands or lymphoepithelial tissue in the nasopharynx.<sup>4</sup> Nasopharyngeal carcinoma is common in other countries and certain ethnic groups such as China, Southeast Asia and North Africa.<sup>8</sup> Indonesia is one

of the countries with a high prevalence of NPC patients outside China. Research in South China, especially in Hong Kong and Guangzhou, averaged NPC can reach 10-150 cases per 100,000 population annually. In the West (America and Europe), the incidence of NPC is rare, with an incidence of about 0.5/100,000, with a rate of 1-2% of all head and neck cancers.<sup>9</sup>

According to the age distribution, NPC is one of the most prevalent malignancies in Indonesia and frequently affects people in their prime working years. Therefore, the high care expense and lengthy treatment are the primary issues with cancer. This results in financial loss for the victims, their families, and the government.<sup>10</sup> This study aims to describe the characteristics of NPC patients in Dr. Soetomo General Academic Hospital from January 2017 – December 2018.

## METHODS

The design of this study is a retrospective descriptive by taking medical records of patients with NPC who seek treatment at the Otorhinolaryngology, Head and Neck Surgery Outpatient Unit Head and Neck Surgical Oncology Division, Dr. Soetomo Hospital, Surabaya, for the period January 2017-December 2018 that meet the inclusion and exclusion criteria.

This study uses total sampling to record the patient's data based on the inclusion and exclusion criteria. The inclusion criteria of this study were all new patients with a diagnosis of NPC at Dr. Soetomo Hospital Surabaya from January 2017 – December 2018. Patients have complete medical record data. The exclusion criteria were incomplete medical record data.

The basic data taken are gender, age, education, and occupation. Complaints assessed are the main complaints of patients who make patients come for treatment listed in the medical record data. NPC stage, the stage of the patient when it was first established, was recorded in the medical record data, along with the type of histopathology.

## RESULTS

The population covered by the study were new patients, all of whom met the inclusion and exclusion criteria and underwent examination at Dr. Soetomo Hospital Surabaya from January 2017 to December 2018. There were 262 new patients with NPC from January 2017 – December 2018. [Table 1](#) shows the respondent's characteristics. The results showed that the most sex was male, 192 patients (73.28%) with a male and female ratio of 2.7:1. The most age range was 51-60 years, 85 patients (32.44%). The youngest patient was 16 years old, and the oldest patient was 82 years old. The mean age of the patient was 47 years. Most sufferers are entrepreneurs, with 67 sufferers (25.57%). The most recent education of sufferers was in senior high school, with 111 patients (42.36%).

The main complaints of patients in this study were lumps in the neck in 130 patients (49.61%), followed by complaints of headache in 38 patients (14.5%) and runny nose mixed with blood in 35

**Table 1. Respondent's characteristics.**

Characteristics	Number of participants (n)	Percentage (%)
Sex		
Male	192	73.28
Female	70	26.71
Age		
0-20 years old	6	2.29
21-40 years old	53	20.22
41-50 years old	19	7.25
51-60 years old	85	32.44
61-70 years old	74	28.24
71-80 years old	20	7.63
> 80 years old	5	1.90
Worker		
Fisherman	1	0.38
Farmer	8	3.05
Retired	50	19.08
Teacher	3	1.14
Student	3	1.14
Government	7	2.67
Housewife	33	12.59
Self-employed	34	12.97
Labor	25	9.54
Private Employees	11	4.19
Entrepreneur	67	25.57
Driver	9	3.43
No worker	4	1.52
Construction worker	1	0.38
Seamstress	3	1.14
Healthcare Workers	3	1.14
Education		
Did not go to school	11	4.19
Elementary school	71	27.09
Junior high school	48	18.32
Senior high school	111	42.36
University	21	8.01

**Table 2. Main complaints of the patients.**

Main complaint	Number of participants (n)	Percentage (%)
Nose		
Cold mixed with blood	35	13.35
Dead nose	16	6.10
Epistaxis	11	4.19
Ear		
Tinnitus	20	7.63
Hearing loss	2	0.76
Neck		
Lump	130	49.61
Intracranial		
Headache	38	14.5
Eye		
Diplopia	10	3.81

patients (13.35%), the lowest number was complaints hearing loss of 2 sufferers or 0.76% ([Table 2](#)).

In this study, the highest distribution of patients based on stage was stage IVa with 78 patients (29.77%), then stage IVb with

75 patients (28.62%) and stage III with 69 patients (26.33%). The lowest number of stages was with one patient (0.38%; [Table 3](#)).

In this study, the distribution of patients based on the histopathological

**Table 3. Patient characteristics by cancer stadium.**

Nasopharyngeal cancer stadium	Number of participants (n)	Percentage (%)
I	1	0.38
II	26	9.92
III	69	26.33
IVa	78	29.77
IVb	75	28.62
IVc	13	4.96

**Table 4. Patient characteristics based on the histopathological type.**

Histopathological type	Number of participants (n)	Percentage (%)
WHO type 1 (Squamous Cell Carcinoma)	2	0.76
WHO type 2 (Non-Keratinizing Carcinoma)	15	5.72
WHO type 3 (Undifferentiated Carcinoma)	245	93.51

type of patients found that the majority were non-keratinizing carcinoma undifferentiated type, with a total of 245 patients (93.51%). At the same time, the lowest proportion were patients with squamous cell carcinoma, namely 2 cases or 0.76% (Table 4).

## DISCUSSION

In previous studies, men were more closely related to the incidence of NPC than women. The five-year life expectancy for NPC sufferers in women is 84%, while in men, it is 78%. This finding results from the differences in smoking and drinking habits between men and women and the fact that more men than women smoke and drink alcohol. Female patients also have a better prognosis not only because of earlier diagnosis but also related to several intrinsic factors that exist in those who are female.<sup>11,12</sup>

The findings of this study are also consistent with Adriana et al.'s (2015) study at Hasan Sadikin Hospital in Bandung, which found that male patients had the highest incidence of nasopharyngeal cancer among 215 samples of patients, at 148 or 68.8%, compared to female patients at 67 or 31.2%.<sup>13</sup> Research by Torre et al. showed the same results where there were more men than women with a ratio of 2:1.<sup>14</sup>

According to the literature, patients with NPC are between 30 and 50. This study supports that claim. Due to the influence of hereditary factors, environmental variables, or early exposure

to carcinogenic agents, the incidence of NPC is rising in this age group. This demonstrates that it takes a long time from the initial exposure to carcinogenic elements to cancer development.<sup>2,3,15</sup> The findings of this study are also consistent with studies by Rahman et al. (2015) at Dr.M.Djamil Hospital Padang, which found that the incidence of nasopharyngeal cancer increases beyond the age of 30, reaching its highest peak between the ages of 45 and 55.<sup>16</sup>

In a study by Deviana et al. (2016), an even distribution was found between low and high socio-economic status (education, employment, income). In this study, the most reported risk factor was frequent consumption of salted fish (62.5%).<sup>17</sup> Additionally, formaldehyde and wood dust exposure from work sites and exposure to alcohol and cigarette smoke were noted. The study also identified exposure to heavy metals and cotton dust as risk factors.<sup>18,19</sup> According to research by Li et al., exposure to acids, cotton dust, dyes, and inks increases the risk of NPC in textile workers in Shanghai, China. Exposure to cotton dust was found to have a stronger association. However, the exposure-response gradient was only sometimes consistent, and statistical precision could sometimes be improved.<sup>20</sup>

In a 2016 study in Malang, a balanced distribution was found between low and high socio-economic status (education, employment, income), where low education (not attending school – graduating from junior high school) was 56.25%, and tertiary education was 43.75%

(graduating high school and above). The distribution of education levels reported in Makassar is 41.7% of primary schools. The low level of subject education is related to the patient's lack of knowledge of the disease he is suffering from, such as new patients coming for treatment after the tumor is in an advanced stage.<sup>17,21</sup>

In the early stages, NPC is difficult to recognize. Sufferers usually reach an advanced stage when a lump appears in the neck, nerve disorders, or distant metastases occur. Symptoms that appear include nasal congestion, mild epistaxis, tinnitus, ear fullness, otalgia, diplopia and trigeminal neuralgia (N III, IV, V, VI), and a lump that appears in the neck.<sup>22,23</sup>

This study's results align with the literature, which says that the tumor has often grown or is under the mucosa without causing significant symptoms to the patient. Lymph node enlargement is the closest lymphogenous spread of nasopharyngeal cancer cells. Tumour metastasis to the neck lymph nodes can be unilateral or bilateral. Symptoms of enlarged lymph nodes in the neck often occur, which is about 60 - 97.5%, so this is why patients go to the doctor. The most common complaint that causes patients to seek treatment is a lump in the neck, followed by nasal and ear complaints. Patients, on average, waited up to 6 months before seeking treatment. This finding is in accordance with a study reported by Woo et al. The most common complaint found when patients come a lump in the upper neck that is not painful (75%), followed by nasal complaints in the form of snot mixed with blood, appendicitis, post nasal drip, or mild epistaxis (30%) and ear complaints including deafness, tinnitus, and otalgia (20%).<sup>24</sup>

A simple way to describe the condition is by using the stage to categorize the stages of a disease. The illness stage at the time of the initial diagnosis is crucial for determining management and evaluating the likelihood of a successful course of treatment.<sup>25</sup>

The findings of this study are consistent with the literature, which claims that nasopharyngeal cancer symptoms and signs are non-specific. As a result, 80% of patients generally start treatment at stage III or IV. This is also a result of inadequate

healthcare, delays in NPC patients seeking treatment at hospitals due to ignorance, and delays in the early identification of NPC symptoms because these conditions have unusual clinical symptoms. Another study at Dr. M. Djamil Hospital Padang found that patients with stage IV were 75%, stage II were 13.64%, stage III was 11.36%, and no patients came to stage I. This study also found that 11.36% of patients at stage IV C had distant metastases to organs such as the lungs, bones and kidneys.<sup>16</sup>

The results of this study follow the research of Faiza et al. (2016); the most common type of NPC found was the non-keratinizing carcinoma-undifferentiated type at 72.73%, for keratinizing SCC at 13.64% and for the non-keratinizing carcinoma-differentiated type at 11.36%.<sup>26</sup> Although there are variations in numbers, the most prevalent histological type discovered in NPC is non-keratinizing carcinoma-undifferentiated.<sup>25</sup>

In high-risk areas such as China, the highest incidence of NPC is found in the fourth decade. However, in Tunisia, Uganda, Sudan, India, East Malaysia, and among black people in America, there is a bimodal age distribution that is not only in the fourth decade but also in the second decade. Ou's study et al., in the United States, the most common histopathological type of NPC patients was keratinizing squamous cell carcinoma (39.4%), which was dominated by Caucasian ethnicity, followed by undifferentiated non-keratinizing carcinoma (25.0%) with an ethnic majority in China. Most are 40-49 years (23.8%), and 78.9% are male. Non-endemic keratinizing squamous cell carcinoma areas are associated with smoking and alcohol consumption.<sup>15</sup>

According to research by Salehiniya et al., China, Indonesia, Vietnam, India, and Malaysia have the greatest incidence of NPC worldwide. Less than 1% of all malignancies are reported to be NPC in the United States and Europe. In South China, Southeast Asia, North Africa/Middle East, and Antarctica, there is an increase in NPC risk factors related to dietary preservatives, including meat, eggs, fruits, and vegetables. Exposure to wood dust is known to be a risk factor for nasopharyngeal cancer.<sup>27</sup> According to a study conducted on 29,000 woodworkers in England and the US, exposure to wood

dust is associated with a higher risk of developing NPC.<sup>28</sup> Tumor growth and metastasis in NPC patients suspected the role of several molecular biomarkers identified in tumor specimens of patients with NPC.<sup>29</sup> One study showed that the NPC cell growth index could be used to assess the carcinogenesis interaction factor, development and prognosis of NPC. Cell proliferation index could always be assessed with the Ki-67 protein expression test.<sup>30</sup>

The limitation of this research is that some data in the medical records of patients with NPC are incomplete, so we need to complete them by contacting the patient.

## CONCLUSION

Characteristics of new NPC were obtained from January 2017 - December 2018 at Dr. Soetomo Hospital Surabaya found 262 patients with NPC. Male sufferers are more than females; the largest age group is 41-50. Most jobs are private employees, and most sufferers' last education is high school. The main complaint of most patients was a lump in the neck, and the patient came with an advanced stage where the most found was stage IV. The histopathological type of most patients is non-keratinizing carcinoma undifferentiated type.

## ACKNOWLEDGMENTS

The authors thank the principal of the Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Dr. Soetomo General Academic Hospital Center.

## AUTHOR CONTRIBUTION

AWU contributes to conceiving and designing the study, searching appropriate literature, acquiring and analyzing collected data, and preparing and editing the final manuscript. ACR contributes to conceiving the study, analyzing collected data, editing and reviewing the final manuscript, and as a guarantor of this study.

## FUNDING

There was no external funding for the execution of this research.

## CONFLICT OF INTEREST

The author reports no conflicts of interest in this research.

## ETHICAL CLEARANCE

This research has obtained an Ethical Clearance Statement from the Health Research Ethics Committee of Dr. Soetomo Hospital Surabaya with number 1660/KEPK/XI/2019

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