



(RESEARCH ARTICLE)



Characteristics of risk factors in nasopharyngeal carcinoma patients at Sanglah general hospital, Denpasar, Period July – September 2021

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Abstract

Introduction: Nasopharyngeal carcinoma (NPC) is the most common head and neck malignancy in Indonesia and places it as the fourth most common among all malignancies in Indonesia. In Indonesia, it is estimated that the incidence of NPC is 6.2 per 100.000 population or 12.000 new cases per year. NPC patients can occur at all ages, the average age of NPC patients is 45-55 years with an incidence of 23.3 cases/100.000 men and 8.9 cases/100.000 women. The ratio of men and women is 2-3:1.

Objective: Knowing the characteristics of patients with nasopharyngeal carcinoma in the ENT Department/KSM-KL Sanglah General Hospital for the period July-September 2021 based on environment's exposure, food's exposure and frequent recurrent respiratory infections.

Methods: In this study, the research design used a cross-sectional descriptive by taking secondary data from the medical records of patients with undifferentiated subtype of nasopharyngeal carcinoma and Balinese people who were treated at the ENT polyclinic at Sanglah General Hospital Denpasar and questionnaires in the period July - September 2021.

Result: In this study, it was found that patients with nasopharyngeal carcinoma, the most environmental exposure groups of NPC patients were exposure to incense or incense smoke, namely 29 people (72.5%), exposure to second-hand smoke in the workplace, namely 27 people (67.5%), exposure to dust or sawdust, namely as many as 24 people (60%).

Conclusion: This study involved 40 patients and found that patients with nasopharyngeal carcinoma in the environmental exposure group of NPC sufferers were exposure to incense or incense smoke, namely 29 people (72.5%), based on the highest consumption pattern on burnt food consumption patterns, namely 25 people (62.5%) and based on exposure to recurrent respiratory infections only 10 people (25%) experienced frequent recurrent respiratory infections.

Keyword: Nasopharyng cancer; Head and Neck Cancer; Characteristics; Undifferentiated subtype

1. Introduction

Nasopharyngeal carcinoma (NPC) is the most common head and neck malignancy in Indonesia and places it as the fourth most common among all malignancies in Indonesia. In Indonesia, it is estimated that the incidence of NPC is 6.2 per 100.000 population or 12.000 new cases per year. NPC patients can occur at all ages, the average age of NPC patients is 45-55 years with an incidence of 23.3 cases/100.000 men and 8.9 cases/100.000 women. The ratio of men and women

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is 2-3:1. Most incidences occur in South China, especially Guangzhou, Hong Kong, and Taiwan as NPC endemic areas, which reach 10-150 cases per 100.000 population [1].

Similar to other chronic diseases, NPC presents many challenges that go beyond treating the disease. The early stages of NPC are difficult to enforce because of the hidden location of the nasopharynx. Misdiagnosis often occurs due to lack of knowledge about the early signs and symptoms of nasopharyngeal carcinoma. This malignancy is manifested by a variety of non-specific signs and symptoms. Although the incidence is high, doctors' awareness of NPC is inadequate, potentially causing many to be diagnosed late or missed. Many cases are referred to the hospital at an advanced stage. Knowing the description of nasopharyngeal carcinoma patients at Sanglah General Hospital is important because it can be used as a reference in early diagnosis so that appropriate therapy can be given to patients with nasopharyngeal carcinoma [1,2]

2. Material and methods

In this study, the research design used was a descriptive cross-sectional study by collecting secondary data from the medical records of patients with nasopharyngeal carcinoma and Balinese people who were treated at the ENT polyclinic at Sanglah Hospital Denpasar and questionnaires in the period July - September 2021. The study was conducted at Sanglah General Hospital in Denpasar. The study population was all patients with nasopharyngeal carcinoma and Balinese people who came to the ENT Polyclinic at Sanglah Hospital, Denpasar, for the period July-September 2021. The samples were patients who met the inclusion criteria. The inclusion criteria for this study were patients with undifferentiated subtypes of nasopharyngeal carcinoma and Balinese ethnicity who came to the ENT Polyclinic at Sanglah General Hospital, July - September 2021. Exclusion criteria were nasopharyngeal carcinoma patients who had incomplete medical records which included information about all the variables studied.

An assessment and statement of the ethical suitability of this study was provided by the Research Ethics Commission of the Faculty of Medicine, Udayana University, Sanglah General Hospital Denpasar (1586/UN/14.2.2.VII.14/LT/2022)

3. Results

This research is a descriptive study using a cross-sectional design. From the medical record data, it was found that there were 40 patients with undifferentiated nasopharyngeal carcinoma and Balinese ethnicity who came to the ENT-KL Polyclinic at Sanglah General Hospital in the period July - September 2021. Characteristics of patients with nasopharyngeal carcinoma are presented in tabular form.

Table 1 Characteristics of Nasopharyngeal Carcinoma Patients based on environmental exposure

Environmental Exposure	Rarely	%	Frequently	%
Kitchen firewood smoke	27	67.5	13	32.5
The smoke of mosquito coils burning in the house	25	62.5	15	37.5
incense or frankincense	11	27.5	29	72.5
Dust/sawdust	16	40	24	60
Sprayed liquid fertilizer	26	65	14	35
Sprayed insect poison	24	60	16	40
Active cigarette smoke	19	47.5	21	52.5
Passive cigarette smoke at home	23	57.5	17	42.5
Passive cigarette smoke in the workplace	13	32.5	27	67.5
Passive cigarette smoke during childhood to adolescence 19	47.5		21	52.5
Total	N =40			100 %

Based on exposure to the environment, the distribution of NPC sufferers is as shown in Table 5.1. It can be seen that the most environmental exposure groups of NPC sufferers are exposure to incense or incense smoke, namely 29 people

(72.5%), exposure to passive cigarette smoke at work, namely 27 people (67.5%), exposure to dust or sawdust as many as 24 people (60%).

Table 2 Characteristics of Nasopharyngeal Carcinoma Patients based on food consumption patterns

Age	N	%
60-70 years old	33	56.9
71-80 years old	19	32.8
81-90 years old	6	10.3
>91 years old	0	0
Total	58	100

Table 3 Characteristics of deafness in elderly patients by type of deafness

Consumption Pattern	Rarely	%	Frequently	%
Salted fish (salted anchovies)	19	47.5	21	52.5
Preserved or salted vegetables, fruit and meat	29	72.5	11	27.5
Burnt food	15	37.5	25	62.5
Foods that are processed or fried at temperatures > 120 °C	28	70	12	30
Total	N =40		100 %	

Based on table 5.2, the group with the highest consumption pattern is the consumption pattern of burnt food, namely as many as 25 people (62.5%) and the consumption pattern of salted fish, namely as many as 21 people (52.5%).

Table 4 Characteristics of Patients with Nasopharyngeal Carcinoma based on recurrent respiratory infections

Recurrent Infection	Rarely	%	Frequently	%
Recurrent Respiratory Infection	30	75	10	25
Total	N=40		100 %	

Based on table 4 it was found that 8 elderly patients with deafness or 13.8% experienced mild deafness with an intensity range between 26-40 dB, 17 patients or 29.3% experienced moderate deafness with an intensity range between 41-55 dB, 20 elderly patients with deafness or 34.5% who experienced moderate to severe deafness with an intensity range between 56-70 dB, 7 elderly patients with deafness or 12.1% who experienced severe deafness with an intensity range between 71-90 dB and there were 6 elderly patients with deafness or 10.3% who experience very severe deafness with an intensity above 90 dB.

Table 5 Characteristics of deafness in elderly patients based on the side of the ear

The deaf side of the ear	N	%
Unilateral	5	8.6
Bilateral	53	91.4
Total	58	100

Based on table 5 there were 5 elderly patients with deafness or 8.6% on one side of the ear or unilateral and 53 elderly patients with deafness or 91.4% on both sides of the ear or bilaterally

4. Discussion

In this study, it was found that patients with nasopharyngeal carcinoma, the most environmental exposure groups of NPC patients were exposure to incense or incense smoke, namely 29 people (72.5%), exposure to second-hand smoke in the workplace, namely 27 people (67.5%), exposure to dust or sawdust as many as 24 people (60%). The nasopharynx is the main area for trapping medium-sized particles (5-10 μm) of inhaled particles, thereby facilitating the absorption of chemicals into the nasopharyngeal epithelium and these inhaled substances are carcinogenic as a risk factor for nasopharyngeal carcinoma. Exposure to smoke from burning for more than 10 years can increase the incidence of nasopharyngeal cancer [3]. Research in America shows that two-thirds of WHO type 1 nasopharyngeal cancer is caused by cigarette smoke but WHO nasopharyngeal cancer types 2 and 3 are not related to cigarette smoke [4]. Cigarette smoke contains about 4000 chemical compounds and more than 60 of these chemical compounds are carcinogens [3]. Several epidemiological studies have found that the risk factors for developing nasopharyngeal carcinoma increase in people exposed to wood dust and all of these things depend on the duration and dose of exposure. Apart from that, one of the other risk factors is people who work at high temperatures and flammable work environments [1,5].

Characteristics of patients with nasopharyngeal carcinoma based on consumption patterns were mostly burnt food consumption patterns, namely 25 people (62.5%) and salted fish consumption patterns, namely 21 people (52.5%). This is in accordance with Azizah's research in 2017 which stated that there was a relationship between the consumption of grilled fish or grilled meat and nasopharyngeal carcinoma. This can happen because food that is burned will produce a preservative effect from combustion smoke which contains formaldehyde. This effect is genotoxic which causes p53 mutase (oncogenesis gene) so that the effect increases, then cell changes occur, chromosome shortening, DNA chain fragility and genetic mutations. For salted fish consumption patterns, research by Azizah said that there was a relationship between consumption patterns and the incidence of nasopharyngeal carcinoma. The process of salting or drying using the help of sunlight causes a nitrosation biochemical reaction. Salted fish will react with nitrate and nitrite groups to form nitrosamines and volatile nitrosamines which can later change the composition of DNA, RNA and protein in body cells (Yu and Yuan 2002). Then the metabolism of nitrosamines which is activated by the oxidation mechanism causes DNA mutations that cause nasopharyngeal carcinoma [7].

In this study it was found that based on exposure to recurrent respiratory infections, 10 people (25%) experienced frequent recurrent respiratory infections. Several studies have revealed that chronic recurrent infections of the ear-nose-throat and lower respiratory tract double the incidence of nasopharyngeal carcinoma [4]. Some bacteria can convert nitrate to nitrite, thus producing a chemical structure that is carcinogenic, namely a mixture of N-nitroso [6].

5. Conclusion

This study involved 40 patients and found that patients with nasopharyngeal carcinoma in the environmental exposure group of NPC sufferers were exposure to incense or incense smoke, namely 29 people (72.5%), based on the highest consumption pattern on burnt food consumption patterns, namely 25 people (62.5 %) and based on exposure to recurrent respiratory infections only 10 people (25 %) experienced frequent recurrent respiratory infections.

Compliance with ethical standards

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Disclosure of conflict of interest

The author reports no conflicts of interest in this work.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent is not required because taking secondary data.

References

- [1] Adham M, Kurniawan AN, Muhtadi AI, Roezin A. Nasopharyngeal carcinoma in Indonesia: epidemiology, incidence, signs, and symptoms at presentation. *Chinese journal of cancer*. 2012; 31(4):185-96.
- [2] Jayalie VF, Paramitha MS, Liu CA. Profile of Nasopharyngeal Carcinoma in Dr. Cipto Mangunkusumo National Hospital. Department of Otorhinolaryngology, FM Universitas Indonesia. 2016; 156-62
- [3] King SN, Dunlap NE, Tennant PA, Pitta T. Pathophysiology of radiation- induced dysphagia in head and neck cancer. *Dysphagia*. 2016; 31(3):339-51.
- [4] Cottrill, C.P. dan Nutting, C.M. Tumours of The Nasopharynx. In: Evans, P.H.R., Montgomery, P.Q. and Gullane, P.J. eds. *Principles and Practice of Head and Neck Oncology*. Martin-Dunitz. 2010; pp.193-214.
- [5] Fachiroh J, Schouten T, Hariwiyanto B, Paramita DK, Harijadi A, Haryana SM, Ng MH, Middeldorp JM. Molecular diversity of Epstein-Barr virus IgG and IgA antibody responses in nasopharyngeal carcinoma: a comparison of Indonesian, Chinese, and European subjects. *The Journal of Infectious Diseases*. 201;190:53-62.
- [6] Chien, C.R., Chen, S.W., Hsieh, C.Y. and Liang, J.A. Retrospective comparison of the AJCC, 5th edition classification for nasopharyngeal carcinoma with the AJCC 4th edition. An experience in Taiwan. *Jpn J Clin Oncol*. 2011;31(8):363-9.
- [7] Azizah, Nailul. 2017. Relationship Between Consumption of Salted Fish, Fish/Smoked Meat, and Canned Food with Nasopharyngeal Carcinoma in Abdul Moeloek Hospital in the 2014-2016 Period. Bandar Lampung: Faculty of Medicine. 2017.