RISK FACTOR OF NASOPHARYNGEAL CARCINOMA DR. HASAN SADIKIN GENERAL HOSPITAL BANDUNG

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Abstract

Introduction: Nasopharyngeal carcinoma (NPC) is malignancy of squamous cells on nasopharyngeal epithelial layer and the most common Head and Neck malignancy found in Indonesia. Etiology of NPC is multifactorial including, food, environment, genetics, and Epstein-Barr virus infection. The study aimed to determine the highest risk factors of nasopharyngeal carcinoma in Otorhinolaryngology-Head and Neck Surgery Department dr. Hasan Sadikin General Hospital Bandung.

Methods: The study design was descriptive retrospective from medical record of NPC patients at Otorhinolaryngology-Head and Neck Surgery Department, dr. Hasan Sadikin General Hospital Bandung in 2010-2015.

Result: There were 462 nasopharyngeal carcinoma patients in this research (265 men and 161 women) with three There were 462 nasopharyngeal carcinoma patients in this research (265 men and 161 women) with three most common risk factors history of smoking (50.7%), mosquito coils use (43.2%), and consumption of salty fish (39.7%).

Conclusion: The most important risk factors for nasopharyngeal cancer in this study include: smoking, mosquito coils, and consumption of salty fish

Article Info

Keywords:

Risk factor, nasopharyngeal carcinoma, smoking, mosquito coils use, consumption of salty fish

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1. INTRODUCTION

Nasopharyngeal carcinoma (NPC) is a malignancy of squamous cells on nasopharyngeal epithelial layer with Rosenmuller fossa is the most common predilection site. Nasopharyngeal carcinoma belongs to the top five malignancies after cervical cancer, breast cancer, lymph nodes, and skin [1].

The highest incidence of NPC is found in Asia and rarely found in American and Europe [2]. Nasopharyngeal carcinoma can be found in all countries from five continents, but the highest incidence is in southern China, especially in Guangdong province, which is 17.8 per 100,000 population per year with a frequency 100 times higher than Caucasians [3].

The prevalences of NPC in Indonesia is 4.7 new cases per 100,000 population per year or around 12,000 cases per year and is the most commonly found otolaryngology malignancy in Indonesia. Comparison between men and women is 2-3:1 [4]. There are 692 (43.7%) NPC patients in Hasan Sadikin General Hospital, Bandung within 2010-2014 with more male patients (65.7%) and occur most in the 46-55 age group (29.6%) [5].

Etiology of NPC is multifactorial including genetic factors, Epstein Barr virus infection (EBV), environmental factors such as exposure to carcinogens (formaldehyde), wood dust and firewood fumes, smoking, and food (consume salted fish that contain nitrosamine) [6, 7].

Research on the risk factors for NPC in Indonesia has never been done. On this basic researchers want to conduct research. The purpose of this study was to determine the risk factors for NPC at RSHS as a referral center Hospital in West Java.

2. MATERIAL AND METHODS

This research method is a retrospective descriptive based on medical record data of NPC patients that including the inclusion and exclusion criteria. The inclusion criteria were all patients diagnosed with NPC at the ORL-HNS outpatient ward subdivision of Head Neck Surgery, RSHS, Bandung from 2010 to 2015. Exclusion criteria is incomplete medical records.

3. RESULT

There were 482 patients with head and neck malignancy in ORL-HNS ward at RSHS, 426 data for NPC and 56 data for non-NPC patients, with the results:

Table 1. Characteristics of Research Subjects

Variable	Group	
	NPC n=426	Non-NPC n=56
Age		
Mean±STD	43.34±14.351	53.553±13.962
Median	45	53.50
Range (min- max)	From 10.00 to 86.00	20.00-81.00
Sex		
Male	265 (62.2%)	28 (50%)
Female	161 (37.8%)	28 (50%)

Based on these results, obtained a comparison of characteristic between NPC and non-NPC. Average for the NPC group, it was 43.34±14.351 while in the non-NPC group it was 53.553±13.962. Male (62.2%) in the NPC group was more than female (37.8%) while in the non-NPC group there was no difference between the gender.

Table 2. Risk Factors for NPC and Non-NPC

Variable	Group	
	NPC n=426	Non-NPC n=56
Use of ONB		
Yes	184 (43.2%)	15 (26.7%)
No	242 (56.8%)	41 (73.3%)
Number of ONB		
<1	24 (5.6%)	5 (33.4%)
2-4	160 (37.6%)	10 (66.7%)
Time of smoking		
<10 years	77 (18.1%)	10 (17.8%)
>10 years	139 (32.6%)	23 (41%)
Do not smoke	153 (35.9%)	19 (39.9%)
Passive	57 (13.4%)	4 (7.3%)
Alcohol consumption		
Yes	60 (14.1%)	20 (35.7%)
No	366 (85.9%)	36 (64.3%)
Family history of cancer		
Yes	30 (7.0%)	2 (3.6%)
No	396 (93.0%)	54 (96.4%)
Salted Fish		
Yes	169 (39.7%)	3 (5.4%)
No	257 (60.3%)	53 (94.6%)

Description: ONB=Mosquito coils

The risk factors that increase the prevalence of NPC consists of a history of smoking (50.7%), use of mosquito coils (43.2%), history of consuming salted fish (39.7%), alcohol consumption (14.1%), and a family history of cancer (7%).

Table 3. Most Risk Factors in NPC

Variable	Research Group Year 2010-2015 (n=426)
Cigarettes	216 (50.7%)
Mosquito coils	184 (43.2%)
Consumption of salted fish	169 (39.7%)

The most risk factors for NPC group consisted of smoking history (50.7%) with smoking duration more than 10 years (32.6%), use of mosquito coils (43.2%), and consuming salted fish (39.7%).

Table 4. Most Risk Factors for Non-NPC

Variable	Year 2010-2015 (n=56)
Cigarettes	33 (58.8%)
Alcohol consumption	20 (35.7%)
Mosquito coils	15 (26.7%)

In the non-NPC group the most risk factors consisted of smoking history (58.8%) with smoking duration more than 10 years (41%), alcohol consumption (35.7%), and use of mosquito coils (26.7%).

4. DISCUSSION

In this study showed male more than women with a ratio of 1-2:1. Differences between men and women may be due to different lifestyle habits (e.g., tobacco consumption) or biological differences. The NPC occurred at age of 29-57 years of age and non-NPC groups at the age of 40-68 years. Based on the results of Septiani's (2016), NPC patients have the range age between 50-59 years, men more than women [8]. In the United States, age and sex are very important to determine the risk of carcinoma of the head neck. The average age of patients at diagnosis is 55-65 years, so it can be concluded that an older adults have a greater risk than children and young adults. Age and sex in NPC are associated with other factor etiology of NPC such as genetic, environmental, and EBV infection [9].

Risk factors for smoking in cases of NPC (50.7%) and non-NPC cases (58.8%). Smoking and alcohol consumption are thought to be the dominant risk factors. Research conducted according to Stevens, smoking can increase the risk of NPC by 5.8 times, alcohol can increase the risk by 3.6 times, so both can increase the risk up to 19 times [10]. Research conducted by Wen-Qiong Xue shows that smoking can increase the occurrence of NPC compared to non-NPC. Cigarettes contain carcinogenic substances such as nicotine and polycyclic aromatic hydrocarbons that cause gene mutations, and methylation so that there is a change in nasopharyngeal epithelial cells that are in direct contact with the mucosa during inhalation [11].

The use of mosquito coils in NPC patients was (43.2%) and non-NPC (26.7%). Based on Septiani's research (2016), mosquito coils have a 2.58 times risk of NPC [8]. According to the 2013 Basic Health Research Basis, Indonesia is a country of use of mosquito coils at 48.8% [12]. According to Moore MA, mosquito coils are the most common risk factor for NPC in Indonesia and Malaysia. The mosquito coils contain carcinogenic ingredients in the form of formaldehyde and acetaldehyde which can irritate the upper respiratory tract [13]. According to the International Agency for Research on Cancer (IARC), formaldehyde and acetaldehyde are at risk of developing NPC. Formaldehyde and acetaldehyde from mosquito coils bind to intracellular proteins that interfere with DNA replication and cause mutations in oncogenic, resulting in changes in morphology, cell function, and immunological reaction abnormalities in nasopharyngeal epithelial cells [14].

Other risk factors that influence its high incidence of NPC is regularly consume salted fish. According to Tabuchi's research in Japan, the consumption of salted fish food regularly increases the incidence of NPC 3.15 times. Salted fish contains nitrosamine which appears in the process of salting and drying of salted fish under the heat of the sun. In the process, sunlight will react with nitrates in the salted fish meat and form nitrosamine compounds that increase carcinogenesis in nasopharyngeal epithelial cells [15].

Nasopharyngeal risk factors was multifactorial. In this study, only a few of NPC patients based on medical record data accompanied by data regarding NPC risk factors, this was one of the weaknesses of this study.

5. CONCLUSION

The most risk factors that influence the occurrence of NPC at ORL-HNS RSHS Bandung outpatient ward in 2010-2015 consist of the use of mosquito coils, smoking and consumption of salted fish.

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