

Characteristics of Patients with Malignant Laryngeal Tumors in Annually Forest Fire Region in Indonesia

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ABSTRACT

Banjarmasin is one of the regions that annually face the forest fire. The fire led to the low quality of the air. The low quality of the air is one of the risk factors of the malignant laryngeal tumor. The characteristics of patient with malignant laryngeal tumor in Banjarmasin is remain unknown. This study aims to obtain data on the characteristics of patients with malignant laryngeal tumors in the Otorhinolaryngology-Head and Neck Surgery clinic, Ulin Hospital Banjarmasin from January 2018 to February 2020. This study was performed by a retrospective descriptive design. The result of this study found a total of 26 patients, 25 patients were men and 1 patient were woman. The majority of the subject were found on age range 61-70 years (30.77%). All patient came to the hospital due to dyspnea. The type of histopathology and the stage of the cases were similar to the previous publication in non-forest fire area.

Keywords: Malignant Laryngeal Tumor, Incidence, Characteristics, Annually Fire Region.

1. INTRODUCTION

Malignant laryngeal tumors (MLT) are the second most common malignant tumor in the head and neck area [1],[2],[3]. It is also the second most malignant tumor in the airways after a malignant pulmonary tumor [4]. The larynx plays a central role in coordinating upper gastrointestinal-respiratory functions including respiration, speech, and swallowing. The larynx is divided into supraglottis, glottis, and subglottis [5]. The laryngeal malignant tumor could occur in all region, but the most site is the glottis [1].

MLT often occur in men over 40 years old. Most malignant tumors of the larynx (95-98%) was a well differentiated squamous cell carcinoma. The exact etiology is remains debated nowadays. Some of important etiology factor was smoking and alcohol drinkers, including smoke from forest fire [6].

Banjarmasin is one of the cities in Kalimantan Island where the forest fire annually occurs. The forest fire will produce the smoke that may affect the air quality [7]. Air pollution is known as one of the risk factors for the development of malignant laryngeal tumor.

The incidence of MLT in Indonesia is not yet known exactly. An estimated 2-5% of all malignancy [8]. At

Dr. Soetomo hospital Surabaya in the period 1996-2000, there were 257 cases of malignant laryngeal tumors [9]. At Cipto Mangunkusumo hospital Jakarta in the period 2000-2005 found 213 cases of malignant tumors of the larynx or about 6.73% of all malignant tumors in the head and neck area [10]. In Otorhinolaryngology-Head and Neck Surgery (ORL-HNS) clinic Prof. Dr. R.D. Kandou general hospital on the period of January 2010 – December 2012 reported laryngeal tumors in 62 patients or 26.9% of all neck head tumors [11]. At M. Djamil Padang hospital in the period 2011-2012 there were 13 new cases of malignant tumors of the larynx [5]. At Hasan Sadikin hospital Bandung period 2011-2016 obtained as many as 426 cases of malignant tumors larynx [12].

Ulin hospital Banjarmasin does not have epidemiological data of MLT yet. Furthermore, this study was conducted to obtain characteristics data of patients with malignant laryngeal tumors in ORLHNS clinic, Ulin hospital Banjarmasin, Indonesia. The finding in this study may be used as a consideration on managing the MLT in annually forest fire region.

2. METHODS

This study uses a retrospective descriptive design. The subjects of the study were all patients who diagnosed with MLT in outpatient ORLHNS clinic, Ulin hospital Banjarmasin from January 2018 to February 2020 who had a complete medical record data. The characteristics of the patients that will be record including age of the patient (in years old), gender, primary complaints, and histopathology finding. The stage will define according to AJCC 8 (2018) based on tumor primer size, regional neck node, and distant metastasis. The therapy will divide into surgery, chemotherapy, and radiotherapy or combination of them.

The data will then be present in the narrative, table, and figure. The analysis will do descriptively and showed as percentage and additional annotation for the average of age.

3. RESULTS AND DISCUSSION

3.1. Results

In this study, authors found 26 patients that meet the research criterion. The average age of the patient is 59.04 ± 10.54 , ranging from 38 to 81 years old. The most patients are in group 61-70 years old (30.77%), followed by age group 51-60, 41-50, 71-80 years old sequentially 26.92%, 19.3%, 11.54% (Table I).

Of the 26 patients with MLT, 25 were men (96.15%) and only 1 woman (3.85%). Based on the main complaints, all patients with malignant laryngeal tumors are dyspnea. Squamous cell carcinoma was obtained as a most histopathological types in this study 24 (92.1%), followed by 1 (3.85%) case with epidermoid carcinoma and 1 (3.85%) case with adenocarcinoma. The most frequent type of squamous cell carcinoma is well differentiated squamous cell carcinoma (Table 1).

Table 1. Characteristics patients with malignant laryngeal tumor

Characteristics	Number of Cases	Percentage (%)	Additional Notation
Age (years)			
Average\pmSD			59.04 \pm 10.54
≤ 40	2	7.69	
41-50	5	19.23	
51-60	7	26.92	
61-70	8	30.77	
71-80	3	11.54	
> 80	1	3.85	
Gender			
Man	25	96.15	
Woman	1	3.85	
Main complaints			
Dyspnea	26	100.00	
Histopathological overview			
SCC well-differentiated	15	57.69	
SCC moderate-differentiated	6	23.08	
SCC (unknown differentiation)	3	11.54	
Epidermoid Carcinoma	1	3.85	
Adenocarcinoma	1	3.85	
Staging			
I	1	3.85	
II	2	7.69	
III	8	30.77	
IV	15	57.69	

According to the tumor stage, more than half of patient are in stage IV. The next most prevalence is stage III 8 and followed by stage II and I consecutively 30.77%, 7.69%, and 3.85% (Table I).

Data on the treatments found only from 14 patients. Not all of the patients agree to do the advance treatment or die before the treatment given. Surgery is the most common treatment given to the patient. It delivered for 8 patients (57.14%), followed by a combination of surgery and chemotherapy for 2 patients (14.29%). The

others were divided equally (7.15%) to treatment by a combination of surgery and radiotherapy, or combination of surgery, chemotherapy and radiotherapy, or radiotherapy only, or chemotherapy only (Table 2).

Table 2. Characteristics of treatment given

Treatment type	Number of cases	Percentage (%)
Surgery	8	57
Chemotherapy	1	7,14
Radiotherapy	1	7,14
Surgery + Chemotherapy	2	14,29
Surgery + Radiotherapy	1	7,14
Surgery + Chemoradiation	1	7,14
Total	14	100

3.2 Discussion

Based on previous study, MLT account for 30-40% of the overall malignant tumors of the head and neck or 1-2.5% of the overall malignant tumors of the human body [12]. Incidence of MLT worldwide was about 130,000 new cases in a year. There were differences incidents between regions due to differences of risk factors prevalence [13].

Banjarmasin, the capital of South Kalimantan is known as region that annually suffer from forest fire. Forest fire will produce a consistent smoke especially in dry season [7]. Study in Boston found that firefighter was the person who susceptible to laryngeal malignancy although there is no history of smoking [14]. Some other profession who have high risk were gasoline station worker, wood processing worker, toxic dust exposure, and mineral industry worker [15].

The youngest age in the study was 38 years and the oldest age was 81 years with an average 59.04 years old. The most patient were in the age range between 61-70 years old (30.77%). This result was similar to previous result in other region in Indonesia who have no history of forest fire [16]. The present finding was also comparable with the study in Africa [17].

The most genders that suffered from MLT in this study were men (96.15%). According to Markou et al., malignant tumors of the larynx are predominant diseases in men, with the ratio between men and women was 30:1. Men were more likely to suffer from malignant laryngeal tumors due to smoking habits and alcohol consumption. Epidemiological data showed that the smoking is the most important risk factor for the occurrence of malignant laryngeal tumors. Generally, the risk was related to the length of the habit and also the number of cigarettes used. Alcohol also plays an important role in the pathogenesis of malignant tumors of the larynx. It dependent on the amount and duration of consumption of such alcohol. Based on research data reduces/stops smoking habits and alcohol consumption prevents malignant tumors of the larynx about 90% [12]. On the case of forest fire, men and women at a

similar risk to MLT. However, the finding on this study did not draw the relationship of MLT to this risk factor.

In this study, the main complaint was dyspnea in all patient. The most common sign in the study by Boci et al was dysphonia (79.8%) followed by dysphagia (42.5%), dyspnea (25.4%), stridor (1.62%) and the rarest manifestation was fetor present only in 1 patient [17]. The common complain found in MLT are usually dysphonia, dysphagia, odynophagia, sensations of stuck in the throat, respiratory disorders due to airway obstruction, blood clots, and pain [5]. Symptoms of MLT are affected by the location and size of the tumor [13]. Our result represent that the majority of the cases were in advance stage. In addition, the low air quality due to annual forest fire may affect the dyspnea in our cases. However, an advances study should be done to prove this hypothesis.

The most histopathological results in this study were well-differentiated squamous cell. This result is comparable with Markou et al. (2013) in Greece who found well-differentiation SCC in 43% cases [12].

Most of the patients in this study came in stage IV. This result is similar to report by Kadriyan et al [15]. On the other study found that patient mostly came at stage III followed by stage IV [17] The majority of patients come at an advanced stage may due to the patient's low socioeconomic status [3]. Stage will affect the life expectancy of the patients. On stages 1 and 2 may reach 90% 5 years survival rate, on the other hand, an advanced stage may only reach 30-50% [12].

The number of patients who can be recorded for the management of malignant tumors in this study is only 14 patients. Several factors may influence this finding such as the patient choice, economic consideration, or patient was died before treatment given. Total laryngectomy is the most frequent treatment modality for primary tumors in advanced stages [3]. In our study, total laryngectomy alone was delivered to 8 patients (57,14 %), followed by the other treatment modality. The result of the present study was comparable with the research in Egypt [3]. On the other hand, the most common treatment reported by Boci et al (2020) was radiotherapy as a single treatment 359 cases (52.8%), followed by surgery and radio-chemotherapy consecutively 273 (37.7%) and 47 (6.9%) cases [15]. The recommended therapy for each patient depends on many factors such as the location of the primary tumor, the stage, the degree of differentiation, and the general condition of the patient. An early-stage tumors mostly can be treated either by radiation or surgery alone. Locally advanced tumors, especially those with the presence of clinical lymphatic, were need a multimodality treatment [17].

4. CONCLUSION

The finding in this study was comparable to other study in Indonesia and the world. The effect of annual forest fire could not be established. The more advance and prospective research should be conducted to more understand the relation cause effect of the smoke from annual forest fire to the MLT.

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