

Prevalence of Non-small Cell Lung Carcinoma among Smokers and Non-smokers

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Abstract: Lung cancer is the most found cancer cases in the whole world with an increase of 1.2 million total patients every year. This has shown a high death rate. This study aims to see the prevalence of non-small-cell lung carcinoma among smokers and non-smokers. The research design used here is a case-control study with 69 cases and 74 control subjects using purposive sampling. Data is collected from medical record in H. Adam Malik General Hospital and USU Hospital. Data is analyzed with Epi Info software using logistic regression test. There is a relationship between age, smoking habit and lung cancer ($p < 0.001$). Patients with a high risk of lung cancer are active smokers age > 60 years. Adenocarcinoma is the most prevalent among carcinoma type. Patients with adenocarcinoma tend to be non-smoker females age > 60 years.

1 INTRODUCTION

Lung cancer is the most common cancer found in the whole world with an increase of 1.2 million patients per year (Parkin, 2000). It shows a high death rate (Globocan, 2012). According to *GLOBOCAN (IARC)*, in the year 2012, the death rate caused by lung cancer is 41.1% (Globocan, 2012).

Based on research done by (Jemal, 2010). showed lung cancer has got a worse prognosis compared to other types of cancer, and it shows a low survival rate (Jemal, 2010). In Indonesia, 67.4% males and around 4.5% females consume tobacco, either in the form of cigars that produce smoke or non-cigars (without smoke).

Lung cancer occurs after long-term damage to genetic material in the cell due to prolonged exposure to risk factors. So far, the most significant risk factor for lung cancer is tobacco smoking habits which can be related to $\pm 85\%$ of lung cancer cases in the United States that led to death. This research aims to observe the characteristic of non-small-cell lung carcinoma among smokers and non-smokers.

2 METHODS

The research design used is case-control with 69 case and 74 control subjects. Data is collected from medical history in medical record installation in H. Adam Malik General Hospital and Universitas Sumatera Utara Hospital.

The sampling method used is purposive sampling technique based on male and female lung cancer patients who have been diagnosed with cytology/histopathology of adenocarcinoma or squamous cell carcinoma, age below 40 to over 60 years. Smoking status is non-smoking (a person who has never smoked and inhaled cigarette smoke), passive smoker (a person who inhales cigarette smoke from a smoker) and active smoker (a person who inhales cigarette smoke directly). The relationship characteristic was analyzed using Epi Info software with logistic regression test. The meaning of statistical test is determined by $p < 0.05$ and 95% confidence interval (CI).

3 RESULTS

3.1 Characteristics of Non-small Cell Lung Carcinoma Patients

Table 1: The Relationship of characteristics between case and control

		Case		Control		p-value	OR	95% CI
		n	%	n	%			
Gender	Male	34	49,3	35	47,3	0.81	1.08	0.56 - 2.08
	Female	35	50,7	39	52,7			
Age	<40	1	1,4	41	55,4	<0.001	1	1
	41-50	8	11,6	16	21,6		20.4	2.3-177.1
	51-60	30	43,5	8	10,8		153.6	18.2-1294.6
	>60	26	37,7	1	1,4		1065.4	63.8-17780.7
Smoker	Non Smoker	18	26,1	39	52,7	<0.001	1	1
	Passive Smoker	16	23,2	0	0,0		NA	NA
	Active Smoker	35	50,7	35	47,3		2.16	1.04-4.49
Total		69	100,0	74	100,0			

Logistic Regression test

Table 1 showed that there is a relationship between age and smoking habit with lung cancer incidence. Patients with a high risk of lung cancer are active smokers, age >60 years.

Table 2: The Relationship between subject characteristic and type of carcinoma

		Adenocarcinoma		Squamous		p-value	OR	95% CI
		n	%	n	%			
Gender	Male	28	45,2	6	85,7	0.07	1	1
	Female	34	54,8	1	14,3		7.2	0.8-64.1
Age	<50	7	11,3	3	42,9	0.073	1	1
	51-60	27	43,5	3	42,9		3.85	0.63-23.4
	>60	25	40,3	1	14,3		10.7	0.95-119.4
Smoker	Non smoker and Passive smoker	33	53,2	1	14,3	0.051	1	1
	Active smoker	29	46,8	6	85,7		0.14	0.01-1.28
Total		62	100,0	7	100,0			

Logistic Regression test

Table 2 showed the patient disposed to have adenocarcinoma was female, age >60 years and non-smoker, although statistically was not significant.

Table 3: Type of carcinoma

	n	%
Adenocarcinoma	62	89,9
Squamous	7	10,1

Table 3 showed the majority of carcinoma's type was adenocarcinoma (89,9%)

4 DISCUSSION

Based on the distribution frequency of subject characteristic in this research, the most common age among the lung cancer patients is >60 years with a similar number of total male and female. Male patients are active smokers whereas the female is non-smokers. This research shows the relationship between age, smoking habit and lung cancer cases. This is similar to the research done by (Mong, 2011) who stated that lung cancer is found the most at the age of over 60 years (\pm 51.4%) (Mong, 2011), and research by (Saragih, 2012) stated that 40.8% of lung cancer cases found in the age group of over 60, followed by 51-60 age group (35.3%) (Saragih, 2012). Another research related to lung cancer found that the incidence increase with age due to the more extended exposure of risk factors and the declining of cell-repair capability (Kumar & Anirban, 2004). There are several risk factors for lung cancers for non-smokers, especially in females such as exposure to environmental smoke, occupational, indoor and outdoor pollution, prion diseases and genetic factors (Sun, 2007).

From 69 cases of lung cancer cases in this research, the most found cytology/histopathology is adenocarcinoma (89.9%) compared to 10.1% of squamous cell carcinoma. The same finding by (Soeroso, 2018). suggested that 92.9 % of lung cancer patients were adenocarcinoma (Soeroso, 2018). However, this aligns with the study done to the population in India, in which adenocarcinoma types are the most found in lung cancer, which is around 30.9% (Malik, 2013).

Another study found that adenocarcinoma is usually found in a female, influenced by hormonal or genetic factors. Nicotine metabolism in a female is far different from that in a male. Moreover, a female has got high P53 incidence, K-ras mutation and tended to develop papillomavirus infection (Liu, 2004). (Syahrudin, 2018) found EGFR mutation exon 19 ins/dels and exon 20 (L858R) respectively 35.6% and 32.8% among Indonesia population (Syahrudin, 2018).

5 CONCLUSIONS

The conclusion from this study is that there is a relationship between age, smoking habits, and lung cancer incidence. Patients with the potential to suffer from lung cancer are active smokers, male ages >60 years. While the adenocarcinoma type tends to develop in non-smokers, female ages >60 years.

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