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Description of Stroke Patients with History of Smoking Activities

Paulus Sugianto*, Fatih Nugraha Abdillah, Isnin Anang Marhana***, Fidiana ***

* Department of Neurology, Faculty of Medicine, Universitas Airlangga; Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

** Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

*** Department of Pulmonology and Respiratory, Faculty of Medicine, Universitas Airlangga; Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

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ABSTRACT

Introduction: Smoking is a habit of Indonesian society and can be found in many places. Smoking increases the risk of cardiovascular problems, which can lead to stroke. **Objective:** Provides an overview of stroke patients who smoke from January to December 2020. **Methods:** This retrospective, descriptive research used medical records and extra data from telephone interviews with patients. A non-probability purposive sampling strategy with a total sampling method is used in this investigation. The observed variables include age, gender, number of cigarettes consumed per day, length of smoking history, type of stroke, and comorbidity. **Results:** The sample consisted of 33 participants chosen among 579 stroke patients. The age range of 56–65 (39.4%) was found to be the most prevalent in the 33 samples, and the sex group was dominated by men (100%). Then, for the smoking habit, the highest number of cigarettes consumed per day was dominated by the group of 9-16 cigarettes per day (45.46%). The group dominates the long smoking history with a smoking history of 30-50 years (42.43%). Ischemic stroke, also known as cerebral infarction, was the most common type (78.79%) among the samples. Of the 33 samples of stroke patients who smoked, 4 (12.12%) experienced comorbidities, including coronary heart disease, diabetes mellitus, and essential thrombocytosis. **Conclusion:** Several factors describe the tendency of stroke patients with a smoking history.

Corresponding Author
Paulus Sugianto
Department of Neurology, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia
Email: paulus.sugianto@gmail.com

INTRODUCTION

Smoking is a habit of Indonesian society, and it can be found in many places. Following China and India, Indonesia has the third-largest population of smokers globally. The prevalence of smoking among Indonesians over 10 years old is 28.8%.[1] In Indonesia, about 80% of smokers start before they turn 19. Given the detrimental effects of smoking, this is a warning to the Indonesian people. Smoking causes negative health, social, economic, and environmental consequences for smokers and others.[1] In terms of health, 85% of households in Indonesia are exposed to cigarette smoke. The estimate is that eight smokers died as active smokers. One person died as a passive smoker exposed to secondhand smoke.[2] Smoking can increase the risk of chronic lung diseases, including COPD, acute exacerbations of asthma, tuberculosis, and increase the risk of dying from TB disease. Then smoking can also increase the risk of cardiovascular disorders, including; endothelial dysfunction, pro-thrombotic effects, changes in lipid metabolism, etc., which can trigger stroke.[3]

A stroke, also known as a cerebrovascular accident (CVA), is an acute attack on the brain's perfusion or blood vessels in the brain. A stroke happens when brain cells die suddenly due to a lack of oxygen supply to the brain caused by a blockage (thrombosis, embolism) or blood vessel rupture (hemorrhagic).[4] Stroke is the leading cause of disability in the world.[5] Stroke has several risk factors, including non-modifiable and modifiable risk factors. Non-modifiable risk factors include age, race, gender, and genetics. Then, the modifiable include hypertension, alcohol consumption, hyperlipidemia, diabetes, and smoking habits.[6] Exposure to cigarette smoke can increase the risk of stroke. This is because the chemicals in cigarette smoke can increase carboxyhemoglobin, platelet aggregation, fibrinogen levels, decreased HDL cholesterol, and direct toxic effects of 1,3-butadiene compounds.

Ischemic stroke and hemorrhagic stroke are both types of stroke. There is a difference in the risk of stroke among men and women who smoke. The chance of stroke due to smoking is 1.54 in men and will increase in women, 1.88 riskier.[7] A study was conducted in July 2018 at the Santa Elisabeth Hospital in Medan. The results showed that 7.8% of the research sample consisted of young adults (20-40 years), the other 50% consisted of middle-aged adults (41-60 years), and the remaining 41.2% were elderly (> 60 years). Of the total sample, 70.6% of them are smoker.[8]

In 2017, a study was conducted on 10,625 stroke patients. From the results of this study, it was found that 2,210 (20.8%) of the total sample had medical complications. Stroke patients suffer from bladder dysfunction, bowel dysfunction, sleep disturbances, pneumonia, and urinary tract infections. In particular, these complications are more common in older patients, patients with hemorrhagic stroke, patients with multiple comorbidities, and patients with severe motor impairment. Patients have impaired swallowing function and severe symptoms from the start of the disease.[9]

OBJECTIVE

To learn about the general description of stroke patients who have a history of smoking activity

METHODS

This is a retrospective descriptive study that uses medical records from stroke patients with a history of smoking at the SMF Neurology Inpatient Installation, Dr. Soetomo General Academic Hospital from January – December 2020, as well as patient interviews over the phone to fill up gaps in the medical records. The population of this study were all stroke patients at the SMF Neurology Inpatient Installation, Dr. Soetomo General Academic Hospital, for the period January - December 2020. The samples in this study were stroke patients in inpatient installations, and they were chosen using total sampling, which is the approach of collecting all samples that meet the inclusion and exclusion criteria between January and December 2020. The inclusion criteria were patients diagnosed with stroke and had a history of smoking, while the exclusion criteria were patients with a stroke diagnosis but had no smoking history.

This study used a non-random sampling strategy to collect data. There were six variables studied in this study; gender, age, type of stroke, the number of cigarettes ingested per day, duration of the history of smoking activity, and comorbidity. The data collection step starts begins by collecting medical records from stroke patients treated at the SMF Neurology inpatient installation, Dr. Soetomo General Academic Hospital, from January to December 2020. The following step is to gather identifiable patient information, such as initials, gender, age, and phone number. After that, they conducted interviews with stroke patients by telephone to obtain data on smoking history. This step was taken because the complete data regarding the patient's smoking activity in the medical record was incomplete, so an interview was needed. The last step is to process and analyze the data that has been obtained.

The successfully acquired data will proceed to the data processing stage, including coding, entering,

and cleaning. Coding is done by assigning a specific code to each variable to facilitate data capture and analysis. Entry is entering data from medical records and interview results into a laptop or computer using software (Microsoft Office). Then, cleaning is the stage of the data cleaning process from possible errors during analysis so that improvements can be made. Furthermore, the data will be grouped according to the research variables, and a table will be created to present the data easier.

RESULTS

A total of 579 patient medical records were reviewed but no complete data on smoking were obtained. This resulted in 579 being contactd over the telephone (Table 1). Of the 579 patients contacted, 33 stroke patients had a smoking history. This study found difficulties in interviewing patients because not every patient could answer the questions. Some patients refuse to answer the phone, while others refuse to answer questions; even 175 stroke patients who stated they did not smoke couldn't determine the truth. The name, gender, age, address, phone number, date of hospital admission, date of hospital discharge, medical record number, type of stroke, number of cigarettes consumed per day, duration of smoking history, and comorbidity of the patient were all recorded.

Distribution of samples by age

Based on the obtained data (Table 2), the most common age group among stroke patients who smoke is 56 – 65 years old (39.40%), whereas the least common age group is 36-45 years old (15.15%). Based on a total sample of 33 people, the data above has an average age of 55 years, with a median value of 55 years, ranging from 39 to 73 years.

Distribution of samples by gender

Based on the obtained data (Table 3), the sample patients were dominated by the male sex group (100%). None of the patients were female (0%).

Distribution of samples based on the number of cigarettes consumed per day

Based on the obtained data (Table 4), the group that smoked 9-16 cigarettes per day was the most frequently encountered (45.46%), and the group that smoked 16-32 cigarettes per day (the highest percentage of cigarettes) was the least, which was only around 3.03%. According to the data above, the average stroke patient who smokes in 2020 consumes approximately 8.8 cigarettes per day. Assuming one pack contains 16 cigarettes equals half a pack of cigarettes more.

Distribution of samples based on how long history of smoking

Based on the obtained data (Table 5), the group with a long smoking history of 31-50 years is the largest (42.43%), while the group with a smoking history of 0-5 years is the least (0%). The result means that stroke patients who smoke in 2020 will have smoked for at least five years. From these data, it was found that the average stroke patient who smoked in 2020 had a smoking history of 29 years. According to previous data, the average age of stroke patients who smoke in 2020 will be 55 years. As a result, it can be assumed that stroke patients who smoke in 2020 start smoking habits at approximately 26 years old.

Sample distribution by stroke type

Based on the obtained data (Table 6), the most common type of stroke suffered is a cerebral infarction or ischemic stroke, affecting as many as 26 people (78.79%).

Sample distribution based on comorbids

Based on the obtained data (Table 7), about 4 (12.12%) of the 33 samples of stroke patients who smoked in 2020 had comorbid. Two of them had coronary heart disease, one had diabetes, and one had essential thrombocytosis.

DISCUSSION

A study by Sofyan *et al.*, stated a relationship between age and the incidence of stroke.[10] This is consistent with the previously described data on 33 stroke patients who smoked. Assuming that the median age of 55 years is considered the limit, stroke is more common (57.85%) for those over 55 than for those under 55. This is in line with Susilawati & Nurhayati (2018), which show that the age group > 55 years has twice as many strokes.[11] It should be noted that the respondents of this study were stroke patients with a history of smoking habits, implying that smoking habits impact how quickly stroke occurs in patients.

Similar results were shown in Simbolon (2018) study with stroke patient respondents who also had a smoking history. According to the research, the middle-adult age group (41-60 years) has the highest number with a percentage of 50.2%, compared to the elderly age group (> 60 years) with a percentage of 41.2%. This is because the patient has two risk factors for stroke, age and smoking, both of which contribute to the development of a stroke.[8] Some of the studies mentioned above support the theory that as you get older, your risks of having a stroke increase, as does smoking, which increases your chances of getting a stroke.[12]

Of the total sample of stroke patients who smoked, 33 patients (100%) were male, and none were female (0%). Several other studies showed different results. Study at RSUD dr. Zainoel Abidin Banda Aceh found that the number of stroke patients was 49 men (51.0%) and 47 women (49.0%). In the study, there was no significant difference between males and women. The study also concluded that there was no relationship between gender and the incidence of stroke.[13] On the other hand, chronic factors can cause strokes, such as smoking, which is more common in male patients and significantly different in female patients. It should be underlined that this study focused on stroke patients who have a smoking history. This impacts the sex ratio in this study, which had only male patients and no female patients.

The number of cigarettes consumed by the sample the most every day was 9-16 cigarettes (45.46%). This statistic is higher than the sample group consuming 5-8 cigarettes per day with ten patients (30.30%) and the sample group consuming 1-4 cigarettes per day with seven patients (21.21%). This is in line with several studies that have been conducted previously. Marisa (2012) stated that the number of cigarettes consumed has a significant impact on atherosclerosis, especially in the blood vessels that supply nutrients to the brain, triggering a stroke.[14]

Of the 33 samples of stroke patients who smoked, about fourteen had a smoking history for 30-50 years (42.43%). This is the group with the highest frequency in this study. A study conducted at Haji Adam Malik Hospital in Medan showed a significant relationship between the length of smoking history and the incidence of stroke.[15] The longer a person smokes, the longer it takes, and the more chemicals and other toxic substances in cigarettes reach the body. Then, the various toxic substances can cause damage to the blood vessel walls, resulting in atherosclerosis or aneurysms in blood vessels.[14]

The most common type of stroke suffered among sample patients is an ischemic stroke (78.79%). This study is in line with Ovina (2013), which shows that there was a relationship between smoking habits and the incidence of ischemic stroke. Smoking can increase the risk of stroke by 2 to 4 times compared to those who do not smoke.[16] Similar results were also shown in study that conducted at Prof. RSUP. Dr. R. D. Kandou Manado, North Sulawesi, that smoking is one of the risk factors for ischemic stroke. From 44 samples of ischemic stroke patients, 57.1% were active smokers, while the remaining 42.9% were passive smokers.[17] Chronic hypertension can change the range of autoregulation to decreased perfusion pressure, making the brain more susceptible to impaired blood flow / ischemia. Furthermore, there is a disturbance in the ability of the endothelium to relax, which will interfere with the mechanism of blood vessels dilation to provide blood supply to the ischemic area of the brain.[18]

Based on the obtained data, about 4 (12.12%) of the 33 samples of stroke patients had complications such as coronary heart disease, diabetes mellitus, and essential thrombocytosis. Most of the four patients who had complications had a smoking history of more than 30 years. The longer a person smokes, the longer it will take, and the more chemicals and toxic substances found in cigarettes will enter the body, perhaps causing other complications besides stroke.[14] Stroke patients with comorbidities such as diabetes, coronary artery disease, and peripheral vascular disease are more at risk of developing myocardial infarction than those who do not. It should be underlined that the sample in this study were stroke patients with smoking habits.

Three stroke patients with atherosclerosis in large blood vessels are more at risk of getting myocardial infarction than those with atherosclerosis in small blood vessels.[14] Civelek *et al.*, showed that 27 of 81 (33.3%) suffered from diabetes mellitus.[19] However, if it is associated with smoking habits, a study conducted in Surakarta City concluded there is no relationship between smoking habits and diabetes mellitus.[20] Then, Pósfai *et al.*, showed no correlation between essential thrombocythemia and the incidence of stroke.[21]

CONCLUSION

Many factors can influence the risk of stroke in people with a history of smoking activity. The study results show that the sample patients are mostly between the ages of 56-65. Then, the sample patient's sex was dominated by the male sex. The group that consumes 9-16 cigarettes per day with an average of 8.8 cigarettes and has the most extended history of smoking activity with a period of 31-50 years with an average history of 29.09 years dominates the number of cigarettes consumed per day. The group dominated the type of stroke suffered from cerebral infarction or ischemic stroke. Of the 33 sample patients, 4 had comorbid, namely; coronary heart disease, diabetes, and essential thrombocytosis.

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ATTACHMENT

Table 1. Description of Interview Responses of 579 Patients

Patient information	Amount
The patient is willing to be interviewed and does not smoke	175 patients
Patient not willing to be interviewed	2 patients
The patient does not answer the phone	167 patients
The patient number cannot be reached	140 patients
Wrong patient number	10 patients
The patient has died	52 patients
Patients willing to be interviewed and smoking (inclusion data)	33 patients
Total	579 patients

Table 2. Distribution of samples by age

Age	Amount	Percentage
36- 45	5	15.15%
46 - 55	9	27.27%
56 - 65	13	39.40%
66 - 75	6	18.18%
Total	33	100.00%

Table 3. Distribution of samples by gender

Gender	Amount	Percentage
Male	33	100.00%
Female	0	0%
Total	33	100,00%

Table 4. Distribution of samples based on the number of cigarettes consumed per day

Number of cigarettes	Amount	Percentage
0 - 4	7	21.21%
5 - 8	10	30.30%
9 - 16	15	45.46%
16 - 32	1	3.03%
Total	33	100.00%

Table 5. Distribution of samples based on how long history of smoking

Long history of smoking	Amount	Percentage
0 - 5	0	0.00%
6 - 10	2	6.06%
11 - 20	4	12.12%
21 - 30	13	39.39%
31 - 50	14	42.43%
Total	33	100.00%

Table 6. Sample distribution by stroke type

Stroke type	Amount	Percentage
Cerebral infarction	26	78.79%
Intracerebral Hemorrhage (ICH)	5	15.15%
Non-specified (NS)	2	6.06%
Total	33	100.00%

Table 7. Sample distribution based on complications

Complication	Amount	Percentage
Yes	4	12.12%
No	29	87.88%
Total	33	100.00%

Table 8. Distribution of samples based on complications experienced by patients

Complications occured	Amount	Percentage
Coronary heart disease	2	50.00%
Diabetes	1	25.00%
Essential thrombocytosis	1	25.00%
Total	4	100.00%