

CHAPTER I

INTRODUCTION

1.1 Background

Stroke is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH), and is a major cause of disability and death worldwide (Sacco *et al.*, 2013). An acute stroke refers to the first 24-hour-period of a stroke event. Stroke is classified as either ischemic (85%) or hemorrhagic (15%) (Kasper, 2017).

Stroke is ranked as the second leading cause of death worldwide with an annual mortality rate of about 5.5 million. Not only does the burden of stroke lie in the high mortality but the high morbidity also results in up to 50% of survivors being chronically disabled. According to the current global burden of disease data on stroke, in 2013 there were almost 25.7 million stroke survivors, 6.5 million deaths, 113 million DALYs due to stroke, and 10.3 million new strokes. Thus, stroke is a disease of immense public health importance with serious economic and social consequences (Donkor, 2018).

Globally, 70% of strokes and 87% of both stroke-related deaths and disability-adjusted life years occur in low- and middle-income countries. Over the last four decades, the stroke incidence in low- and middle-income countries has more than doubled. On average, stroke occurs 15 years earlier in – and

causes more deaths of – people living in low- and middle-income countries, when compared to those in high-income countries (Johnson, 2016).

The prevalence of stroke in Indonesia is 10.9‰, which means as many as 10.9 per 1,000 Indonesians have a stroke, with the highest prevalence in East Kalimantan Province (14.7‰) and the lowest in Papua Province (4.1‰) (Pranatasari and Laksono, 2021). As stated in Basic Health Research (Riskesdas), the prevalence of stroke in East Java is 12.4‰, which is at the 8th position of all the provinces in Indonesia.

Data from the recent INTERSTROKE study indicates that a list of ten stroke risk factors including hypertension, high cholesterol, current smoking, alcohol consumption, diabetes, stress, obesity, heart disease lack of physical activity, and poor diet was responsible for 90% of all strokes. These risk factors, which are predominantly traditional risk factors of stroke, are modifiable, making stroke highly preventable (O'Donnell *et al.*, 2016; Donkor, 2018). According to Basic Health Research 2018, the prevalence of hypertension is higher in urban areas (34.43%), such as Surabaya, than in rural areas (33.72%). The same tendency is also seen in obesity cases, which is 25.1% in urban areas, compared to 17.8% in rural areas.

As explained on the background above, the researcher aspires to study about the correlation between modifiable risk factors and severity of ischemic stroke in Dr. Soetomo General Hospital to analyze about the effect of each modifiable risk factors towards the clinical outcome of ischemic stroke patients. Therefore, this research is hoped to become a source of information ischemic

stroke, consequently doctors can give better education towards patients to prevent more severe ischemic stroke.

1.2 Formulation of Problem

- 1) Does smoking affect the outcome of ischemic stroke?
- 2) Does hypertension affect the outcome of ischemic stroke?
- 3) Does uric acid affect the outcome of ischemic stroke?
- 4) Does diabetes mellitus affect the outcome of ischemic stroke?
- 5) Does dyslipidemia affect the outcome of ischemic stroke?

1.3 Objective of Research

1.3.1 General Objective

To analyze the correlation between modifiable risk factors and the severity of ischemic stroke.

1.3.2 Specific Objective

- 1) To describe the characteristics of the patients.
- 2) To obtain the modifiable risk factor status of ischemic stroke patients.
- 3) To obtain the NIHSS status of ischemic stroke patients to measure the stroke severity.
- 4) To determine the relationship between modifiable risk factors (blood pressure, smoking, blood glucose levels, lipid levels, and uric acid levels) and the severity of ischemic stroke.

1.4 Significance of Study

1.4.1 Theoretical Significance

This research is hoped to increase knowledge and understanding regarding the importance of modifiable risk factors and their effects on severity of ischemic stroke.

1.4.2 Practical Significance

This research is expected to provide empirical evidence to educate society and increase patient's awareness about the importance of living a low-risk lifestyle. In addition, practicing physicians can learn from this study to give a better recommendation for their patients to live a healthy lifestyle in order to prevent stroke.