Description of Blood Pressure of Intracerebral Hemorrhage Patients in Tertiary Hospitals in Indonesia

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Abstract

Background: Stroke is one of the serious health problems that has a high mortality rate and is the leading cause of death worldwide. Intracerebral hemorrhage (ICH) is a subtype of stroke that often causes severe disability or death and is associated with greater morbidity and mortality than ischemic stroke. The main risk factor for intracerebral hemorrhage is hypertension.

Objective: This study aims to identify the description of the blood pressure of ICH stroke patients in Dr. Soetomo General Hospital Surabaya as tertiary hospital in Indonesia.

Methods: This study is a retrospective descriptive study, using medical record data of ICH stroke patients at Dr. Soetomo General Hospital Surabaya during the period of January 2019 to December 2019 involving 206 patients.

Result: Research shows that the number of hemorrhagic stroke patients in Dr. Soetomo General Hospital Surabaya is 206 patients. The majority of hemorrhagic stroke patients are female (52.9%) with an age range of over 35 years old (98.5%). A total of 109 patients (59,2%) did not work, as many as patients (58.7%) with a GCS score of 13-15. A total of patients (69.4%) had a history of hypertension, and 59.2% were in stage 2 hypertension.

Conclusion: ICH stroke patients in Dr. Soetomo General Hospital Surabaya in 2019 mostly occured in women aged over 35 years, not working, with a GCS score of 13-15, and has a history of hypertension. The highest blood pressure is in category of stage 2 hypertension.

Keywords: Hemorrhagic Stroke; ICH; Blood Pressure

1. Introduction

One of the serious health problems that has a fairly high mortality rate and is the highest cause of disability worldwide is stroke. Stroke is one of the main diseases that damage human health. Stroke is the leading cause of morbidity and mortality worldwide. In 2017, stroke was the second most frequent cause of death, after ischemic heart disease, and caused 6.2 million deaths worldwide (Khrisnamurthi et al, 2020). Based on the results of Basic Health Research in 2018 the prevalence rate of stroke in Indonesia was 10.9 per 1000, while in East Java Province it exceeded the National average of 12.4 per 1000 (Kemenkes RI, 2018). Hemorrhagic stroke occurs due to hemorrhage to the brain due to rupture of blood vessels (Unnithan & Mehta, 2021). Hemorrhagic stroke is the second most common type of stroke, with a lifetime risk (Feigin et al, 2018). According to Unnithan & Mehta (2021) hemorrhagic stroke can be divided into two subtypes namely Intracerebral Hemorrhage (ICH) and Subarachnoid Hemorrhage (SAH). Intracerebral hemorrhage (ICH) is a subtype of stroke that often leads to severe disability or death. The incidence rate of ICH is estimated to be around 25 per 100,000 people per year worldwide. So about 1.9 million ICH incidents occur worldwide each year, 80,000 of them in the United States. While the incidence rate of ICH worldwide has not changed significantly since initial estimates from the 1980s, some studies show a moderate decline in high-income countries (Burns et al, 2020). In the United States and other high-income countries, approximately 10% to 20% of all stroke cases are Intracerebral Hemorrhage (ICH), and associated with morbidity and mortality of ischemic stroke (Garg R & Biller J, 2019). The mortality rate of ICH cases is quite high (40% at 1 month and 54% at 1 year), and only 12% to 39% of survivors can achieve long-term functional independence (Mohammad & Qureshi, 2016).

Hypertension is the most common risk factor in intracerebral hemorrhage (Putra et al, 2020). The risk of stroke will increase along with increasing blood pressure up to 3 times (Razdiq & Imran, 2020). Hypertension is the main precipitating factor for stroke, both hemorrhagic and ischemic strokes. Hypertension that causes atherosclerosis plaques continuously will trigger the onset of stroke. The high risk of Intracerebral Hemorrhage (ICH) in hemorrhagic stroke occurs due to the higher degree of hypertension (Liza, S.R et al, 2021). In previous studies, the results were obtained that the highest risk factor in all stroke patients was hypertension by 82.30%, in hemorrhagic stroke patients the main risk factor was hypertension by 100.00% (Puspitasari, 2020).

This study aims to identify the description of the blood pressure of intracerebral hemorrhage patients, especially at Dr. Soetomo General Hospital Surabaya, due to the high mortality rate due to ICH and the lack of research that describes variations in blood pressure in intracerebral hemorrhage patients, is the reason for researchers to conduct research on the description of blood pressure in Intracerebral Hemorrhage (ICH) patients at Dr. Soetomo General Hospital Surabaya for the period of January 2019 – December 2019. The results of this study are expected to provide information about the description of blood pressure in intracerebral hemorrhage patients, so that it can help take preventive measures to reduce the incidence and mortality rate.

2. Methods

This study is a retrospective descriptive study that obtained data from the medical records of ICH patients at Dr. Soetomo General Hospital Surabaya for the period of January 2019 to December 2019. This study used the total sampling technique, resulting in a total of 206 subjects. The subjects included in this study were the first attack stroke patients with a diagnosis of stroke due to ICH, and with a complete supporting examination. Patients with a diagnosis of ischemic stroke, patients with stroke due to SAH, and patients with a CVT diagnosis were not included in the study.

The steps for collecting data in this study are by applying for permission to the Ethics Committee of Dr. Soetomo General Hospital Surabaya, taking ICH stroke patient data in the medical record section of Dr. Soetomo Hospital Surabaya, selecting populations in accordance with inclusion and exclusion criteria to be used as samples, then taking data from medical records in the form of age, gender, occupation, blood pressure, history of hypertension, and Glasgow Coma Scale (GCS). The collected data will be analyzed to describe the research variables presented in the form of frequency and narrative distribution tables.

3. Result

3.1. Gender

Table 1. Sex Distribution of Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

Gender	Total	Percentage
Male	97	47.1%
Female	109	52.9%

Based on **table 1** above, most of the respondents who experienced intracerebral hemorrhage were women, which was 53. 9%, while the male sex who had intracerebral hemorrhage was only 47. 1%.

3.2. Age

Table 2. Age Distribution of Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

Age	Total	Percentage
<20 years	0	0.0%
20-35 years	3	1.5%
>35 years	203	98.5%

Based on **table 2** above, most of the respondents who experienced intracerebral hemorrhage were over 35 years old, which was 98. 5%, and only 1. 5% who are 20-35 years old.

3.3. Occupation

Table 3. Distribution of Occupation Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

Occupation	Total	Percentage
Private Sector	78	37.9%
Civil Servant	19	9.2%
Others	18	8.8%
Jobless	91	44.2%

Based on **table 3** above, the distribution of intracerebral hemorrhage patients shows that the most respondents who are jobless are 44.2%.

3.4. Blood Pressure

Table 4. Distribution of Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

Blood Pressure	Total	Percentage
Normal	1	0.5%
Prahypertension	24	11.7%
Stage 1 hypertension	59	28.6%
Stage 2 hypertension	122	59.2%

Based on **table 4** above, Most of the respondents who experienced intracerebral hemorrhage were in the stage 2 hypertension category, which was 59.2% and only 0.5% in the normal category.

3.5. History of Hypertension

Table 5. History of Hypertension Distribution of Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

History of Hypertension	Total	Percentage
Exist	143	69.4%
None	50	24.3%
Unknown	13	6.3%

Based on **table 5** above, most respondents who experienced intracerebral hemorrhage had a history of hypertension, with percentage 69.4% and only 24.3% had no history of hypertension.

3.6. Glasgow Coma Scale (GCS)

Table 6. GCS Distribution of Intracerebral Hemorrhage Patients at Dr. Soetomo General Hospital Surabaya in 2019

GCS	Total	Percentage
Severe (3-8)	27	13.1%
Moderate (9-12)	57	27.7%
Mild (13-15)	122	58.7%

Based on **table 6** above, Most of the awareness levels of respondents who experienced intracerebral hemorrhage were in the mild category (13-15) which was 58.7% and only 13.1% in the severe category (3-8).

4. Discussion

4.1. Gender

The results of the study obtained by researchers based on the medical records of intracerebral hemorrhage patients at Dr. Soetomo General Hospital Surabaya in 2019, showed that most of the respondents were women,which is 109 respondents (52.9%) and men only 97 respondents (47.1%). This study is the same as the research conducted by Dharmawita (2015) on hemorrhagic stroke patients at the Inpatient Neurology Installation of Dr. H. Abdul Moeloek Hospital in 2014, namely the prevalence of stroke in women is more than that of men with a frequency of 66 female respondents (56.4%) and 51 male respondents (43.6%), also supported by research conducted by (Zalika, 2016) at Muhammadiyah Palembang Hospital in 2014, that the incidence of hemorrhagic stroke is more commonly experienced by women.

This research is different from the results of a study conducted by Yulian et al (2019) in the Rumkital Nerve Inpatient Room Dr. Ramelan Surabaya that the incidence of stroke in men is more than in women with a percentage of 53.85% in men and 46.15% in women. According to Abdul (2009) the risk of stroke in men is 1.25 times higher than in women.

Manurung (2018) mentioned that after entering the menopause phase, women have a risk of stroke due to reduced esterogen hormones which play an important role in preventing stroke.

4.2. Age

The results of the study obtained by researchers based on the medical records of intracerebral hemorrhage patients at Dr. Soetomo General Hospital Surabaya in 2019, the results of the study were obtained by 206 respondents with an ICH diagnosis at Dr. Soetomo General Hospital Surabaya in 2019. Based on the age category, respondents who experienced ICH were mostly over 35 years of age, which is 203 respondents (98.5%). While the remaining only 3 respondents (1.5%) in the age category of 20-35 years. The results of this study are the same as the results of a study conducted by Budi & Bahar (2017) which stated that the incidence of hemorrhagic stroke was more experienced by respondents aged 51-55 years, namely 37.5%, and only 4.2% of respondents aged between 31-35 years. Another study conducted at Arifin Achmad Hospital, Riau Province in 2019 also showed the same results as this study, namely respondents suffered the most strokes in the age range of 51-65 years as many as 60 respondents (52.2%), 35 (30.4%) in the age range of 35-

50 years, 17 (14.8%) in the age range of >65 years, and the least of which was in the age range of <35 years (Fuadi et al, 2020).

Tamba (2019) mentioned that as you get older, the incidence of stroke will increase, especially when you enter the age of > 55 years. This illustrates that the incidence of stroke first tends to occur at an older age. Due to the increasing age of blood vessels will become inelastic and the endothelium experiences thickening in the intima layer, resulting in narrowing of blood vessels which has an impact on reducing blood flow (Alagindera, 2016).

4.3. Occupation

The results of the study that has been conducted on 206 respondents based on the medical records of ICH patients at Dr. Soetomo General Hospital Surabaya in 2019, that are 91 (44.2%) respondents is jobless, followed by private workers 78 (37.9%) respondents, civil servants as many as 10 (9.2%) respondents, and others as many as 18 (8.8%) respondents. The results of this study are the same as the study conducted by Ramdani (2018) obtained the most results in respondents who did not work, namely 28 (38.3%) who had a stroke. Another study conducted by Hartaty and Haris (2020) showed that the distribution of stroke patients work was the most in respondents who were not working, that are 17 respondents with a percentage of 51.5%. The results of the same study conducted by Hadijah (2020) were that as many as 28 (50.9%) respondents were not working.

The risk of stroke is more common in people who are not working. This can happen because of the tendency to a relaxed lifestyle, irregular diet, lazy exercise, and high levels of stress compared to people who work. This factor can result in a lack of metabolic ability in the process of burning food substances consumed, so that there is a risk of a pile of fat and cholesterol levels in the blood that causes atherosclerosis so that it can clog blood vessels that can cause stroke.

4.4. Blood Pressure

from 206 respondents obtained by researchers based on medical records of ICH patients at Dr. Soetomo General Hospital Surabaya in 2019, the most respondents based on blood pressure were in the stage 2 hypertension category as many as 122 respondents (59.2%), followed by the stage 1 hypertension category as many as 59 respondents (28.6%), the prehypertension category as many as 24 respondents (11.7%), and only one respondent (0.5%) with the normal category. This study is in accordance with the results of a study conducted at Al-Ihsan Hospital Bandung in 2017, namely out of 62 stroke sufferers, there were 31 people suffering from hemorrhagic stroke, and were in stage 2 hypertension (77.4%). Another study conducted by Hartono et al (2019), namely 69.44% of hemorrhagic stroke patients have blood pressure classified as stage hypertension

In the results of the Radziq & Imran (2020) study, hemorrhagic stroke patients mostly experience degree 2 hypertension. Pebriani (2017) states that the higher a person's blood pressure, the incidence of hemorrhagic stroke will increase. Patients who experience hypertension are 4.76 times more likely to have a hemorrhagic stroke than those who do not have hypertension (Soewarno & Annisa, 2017). In the research of Nugrahanti et al (2011) found that the majority of hemorrhagic stroke patients had hypertension at the time of hospital admission, which was 84.8%. Meanwhile, according to Mahayani & Putra (2019) in their research, 78.8% of the dominant risk factor for stroke is hypertension. Risk factors for stroke increase in proportion to the

increase in blood pressure. This is because high blood pressure for a long time will damage the walls of the arteries, make the walls of the arteries easier to widen, or narrow, or even rupture.

4.5. History of Hypertension

Based on the results of research on the medical records of ICH patients at Dr. Soetomo General Hospital Surabaya in 2019, there were 143 respondents (69.4%) with a history of hypertension, while those who did not have a history of hypertension were only 50 respondents (24.3%). The results of this study are the same as the results of a study conducted at Sanglah Hospital Denpasar that as many as 35 respondents (77.8%) had a history of hypertension and as many as 10 respondents (22.2%) had no history of hypertension (Mahayani and Putra, 2019). The results of another similar study conducted at RSSN Bukittinggi in 2015, the incidence of hemorrhagic stroke occurred the most in respondents who had a history of hypertension, namely 95.8% (Budi and Bahar, 2017).

The chances of a person having a stroke will be greater because of the higher blood pressure. A person with a history of hypertension is 2.3 times more likely to have a bleeding stroke than a person without a history of hypertension. This condition is due to hypertension can cause damage to the arterial walls which triggers plaque or narrowing of the arterial walls (atherosclerosis). If the plaque ruptures and is carried away by the blood flow to the brain, it can cause a blockage in the blood vessels in the brain so that the blood vessels burst because they are not adequate in receiving pressure due to the blockage and cause a bleeding stroke.

4.6. Glagow Coma Scale (GCS)

Based on the results of research that has been carried out on the medical records of ICH patients at Dr. Soetomo General Hospital Surabaya in 2019, the highest Glasgow Coma Scale score found in this study was in the mild category (13-15) as many as 122 respondents (58.7%), followed by the moderate category (9-12) as many as 57 respondents (27.7%), and the severe category (3-8) as many as 27 respondents (13.1%). The results of the same study conducted at Salatiga Regional Hospital, obtained the highest Glasgow Coma Scale score in the range of 14 to 15 with a percentage of 58% (Garudadwiputra et al, 2022). Another study conducted in the RS. Muhammadiyah Palembang obtained 69.3% of patients had a Glasgow Coma Scale score of 13-15 (Astri et al, 2022). The results of the study conducted by Hartanto et al at Hasan Sadikin Hospital were 79 respondents (59.0%) had a GCS score of 12-14 (Hartanto et al, 2019).

According to Fauzi et al (2022) loss of consciousness occurs due to an imbalance in perfusion and ventilation, so that oxygen entering the brain and the whole body is inadequate and can affect a person's level of consciousness. Based on the results of research that has been carried out by researchers, it can be seen that the level of awareness of ICH patients at Dr. Soetomo General Hospital Surabaya in 2019 is mostly included in the category of good awareness. It depends on how widespread the infarction or bleeding experienced by the patient can affect the patient's consciousness.

5. Conclusion

This study has identified several characteristics of respondents who experienced intracerebral hemorrhage at Dr. Soetomo General Hospital Surabaya for the period January 2019 – December 2019, Most respondents were female with an age range of >35 years, did not work, had a history of hypertension, came with a good level of awareness, and with blood pressure category stage 2 hypertension.

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