

Research Article

Patient Profile Who Died Due To Stroke With BPJS Health Insurance At Indonesia In 2018 and 2019

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ABSTRACT

Background: Stroke is an emergency disease that can cause disability and death to its patient. Stroke become the second disease that cause mortality in the world and in Indonesia stroke become the third disease that cause death with mortality rate as much 138.268. **Objective:** Identify the patient profile that die due to stroke with Badan Penyelenggara Jaminan Sosial (BPJS) Health Insurance in Indonesia. **Methods:** This study is descriptive retrospective research that using a secondary data from BPJS Health Insurance recapitulation data in form of patient diagnosed with stroke in 2018 and 2019 data. The sampling technique that used in this research is total sampling. **Results:** The result of this research are 33521 patients dies because of stroke, 50,2% are male dan 49,8% are female. Most of the stroke patients who died had hypertension (45%), followed by diabetes melitus (41%) and kidney failure (14%). 8% stroke patient died underwent operative management and 92% underwent non-operative management. Most of the patients who died because of stroke died in type B hospitals (50%). The total cost for two years stroke treatment are 29.103.066.192 billion rupiah. **Conclusion:** In 2018 and 2019 stroke mortality rate is higher in male, stroke patient with secondary diagnose of hypertension has higher mortality rate. Mortality rate is higher in male that has hypertension as his secondary diagnose and for female the stroke mortality is higher in diabetes melitus. Type B hospital has high mortality rate of stroke patient.

Keywords: stroke, mortality rates, diabetes melitus, hypertension, renal failure

INTRODUCTION

Stroke is acute neurological emergency that can cause disability or death. The most common symptoms of stroke are paralysis on one or both sides of upper and lower extremities, facial muscle paralysis, impaired olfactory, visual, hearing and cognitive functions (1). According to American Heart Association and American Stroke Society, stroke is the occurrence of infarction in the central nervous system which includes the brain, spinal cord or retinal cell death which causes ischemia (2).

Worldwide, stroke is the second leading cause of death and the third leading cause of disability (3). Meanwhile, in Indonesia stroke become the third disease that cause the most deaths with death rate 138,268 people (4). In Ukraine in 2016 cardiovascular disease caused 63% of deaths with age range between 30 to 70 years had a high mortality rate due to non-communicable diseases (5).

Based on Riskesdas data in 2007, there were 59,5% of deaths caused by stroke. Based on Riskesdas data from Central Sulawesi Province, people aged 75

years have 84,6% a stroke incidence. While based on study conducted by Mutiarasari et al, the incidence rate based on sex, males (17,3%) higher than females (15,8%) (6). In 2011, based on research in Bekasi, it was shown that out of a total mortality rate of 5.001 people, 20% of the mortality caused by stroke. In Bekasi, 19,0% of males and 21,4% of females died from strokes, stroke is the main cause of death in Bekasi (7). In 2018 Indonesia was ranked as the third country in Asia after China and India with 10,9% highest stroke incidence. Based on stroke epidemiology data in Asia, Indonesia is a country with the highest mortality rate with 193,3 death rates per 100.000 person-years(8).

Stroke is divided into two types, ischemic stroke and hemorrhagic stroke. According to the Global Burden Disease study in 2019, ischemic stroke has a greater incidence than hemorrhagic stroke, but hemorrhagic stroke has a higher mortality rate (9). Based on research in Korea from 2012 to 2021, hemorrhagic stroke with the type of subarachnoid hemorrhage causes more death in men with an age range of 50-69 years old, compared to women. However, in 70 years old age group, more women died from subarachnoid hemorrhage (10).

Stroke has both modifiable and non-modifiable risk factors. Modifiable risk factors include high blood pressure, diabetes, high cholesterol, obesity, smoking, alcohol and kidney failure. While the factor that cannot be modified are: age, sex and family history (3). Hypertension and death due to stroke are related. This is evidenced based on research in China that hypertensive patients with systolic blood pressure ≥ 160 mmHg and diastolic blood

pressure ≥ 100 mmHg have 222,8% risk of death (11).

According to research conducted by Abdu Hussen et al, people who live in rural areas have more strokes, both ischemic and hemorrhagic strokes but the cause is still unknown (12). Based on WHO data, 70% developing countries with low middle income have a higher incidence and prevalence of stroke. As many as 84% people in low middle income countries die three years after being diagnosed with stroke, while high income countries have 16% of mortality rate (3).

Until now, stroke still become a disease with high mortality rate, both in the world and in Indonesia. In addition, stroke is also a disease with high economic burden in Asian countries. Based on 2019 data, in Indonesia stroke has cost 135.55 US Dollars for its treatment (13). Meanwhile, in 2018 the health social insurance stated that stroke has costs 2,56 trillion rupiah for health services (14).

Based on the backgrounds, the aim of this research is to know the profile of patients who died from strokes with BPJS Health Insurance in Indonesia in 2018 and 2019.

METHODS

The type of research that used was a retrospective descriptive study by collecting data on recapitulation of BPJS Health Insurance patients that died because of stroke in Indonesia from January 2018 to December 2018 and January 2019 to December 2019.

This research conducted at the head office of the Indonesian BPJS Health Insurance which is located in Cempaka Putih Timur, Central Jakarta. This research took place since December 2022. The population of this study were all stroke patients with BPJS Health Insurance in Indonesia in 2018 and 2019, while the sample were all stroke patients who had died with BPJS Health Insurance in Indonesia in 2018 and 2019.

Technique that used in this research are total sampling, where the data is processed using statistical software and presented in the form of tables and descriptions. This research uses univariate analysis to analyze each variable. This research has passed ethical approval with number No.389/PE/KE/FKKUMJ/XII/2022 issued by the Health Research Ethics Commission, Faculty of Medicine and Health UMJ.

RESULT

This Research was conducted in December 2022. There's 33.521 BPJS Health Insurance patients that died caused of stroke that fulfills the inclusion criteria.

Table 1. Overview of gender in patients who died due strokes

Genders	Years		Total (N)	Percentage (%)
	2018	2019		
Men	8097	8740	16837	50,2 %
Women	8116	8568	16684	49,8 %
Case Total	16213	17308	33521	100 %

Based on table 1, in 2018 there's total 16.213 of stroke mortality with 8.097 male patients and 8.116 female patients. In 2018, more women died from stroke than men. In

2019, More male patients that died because of stroke with total 8.740 deaths, while the women mortality rate were 8.568. Within two years, it was found that men has higher mortality rate (50,2%) compared to female (49,8)

Table 2. Overview of secondary diagnosis in patients who died due to stroke

Secondary Diagnose	Years		Total (N)	Percentage (%)
	2018	2019		
Diabetes Mellitus	6513	7353	13866	41%
Hypertension	7577	7515	15092	45%
Renal Failure	2123	2440	4563	14%
Case Total	16213	17308	33521	100%

Based on table 2 within two years, there's higher mortality rates in stroke patients with Hypertension (45%) compared to diabetes mellitus (41%) and renal failure (14%).

Table 3. Overview of management in patients who died due to stroke

Management	Years		Total (N)	Percentage (%)
	2018	2019		
Operative	841	1980	2821	8%
Non-operative	15372	15328	30700	92%
Case Total	16213	17308	33521	100%

Based on table 3, in 2018 and 2019 there's more patients that died with non-operative management (92%) compared to patients with operative management (8%)

Table 4. Overview of hospital types in patients who die due to stroke

Hospital type	Years		Total (N)	Percentage (%)
	2018	2019		
Class A	1916	2197	4113	12%
Class B	8079	8541	16620	50%
Class C	5521	5817	11338	34%
Class D	697	753	1450	4%
Case Total	16213	17308	33521	100%

Based on table 4, stroke mortality rates were higher in class B hospital (50%) followed by class C hospital with 11338 deaths (34%) then 4113 people (12%) died in class A hospital and type D hospitals became the type of hospital with low mortality rate (4%).

Table 5. Overview of treatment costs based on management of patients who died due to stroke

Management	Years		TOTAL (N)
	2018	2019	
Operative	Rp 12.181.781.496	Rp 13.963.025.156	Rp 26.144.806.652
Non-operative	Rp 1.533.090.964	Rp 1.425.168.575	Rp 2.958.259.539
Total costs	Rp 13.714.872.461	Rp 15.388.193.731	RP 29.103.066.192

Based on table 5, in 2018 13.714.872.461 rupiah was spent for treating stroke patient

who died, 12.181.781.496 rupiah spent on-operative management and 1.533.090.964 for non-operative management.

Whereas in 2019 with total cost of 15.388.192.731 rupiah, 13.963.025.156 rupiah were spent for operative management and 1.425.168.575 for non-operative management.

Within two years, BPJS Health insurance had to pay total of 29.103.066.192 rupiah only for stroke patient who died.

DISCUSSION

Based on this research, the mortality rate within two years was 33.521 people, where the male has higher mortality rate compared to the female. This result supported by a research that conducted by Rextrode (2022) which says that male is more at risk of stroke in middle age (15). This statement also supported by research that conducted in Bekasi in 2011 that the main cause of male death aged 45-55 is stroke (7). However, in this research there's no age variable, so the age of the stroke patients that died could not be verified. Another research conducted in Korea also said that the most common cause of death in men was hemorrhagic stroke, where hemorrhagic stroke is the most common cause of death (10).

In this research, stroke patients with secondary diagnose of hypertension had higher mortality rate compared to other secondary diagnose. This research accordance with the statement which says that hypertension is the main factor triggering stroke. According to Anindhita dand Wiratman (2017) patients with chronic hypertension will experience hyalinization of the blood vessels so the

walls of the blood vessels won't be elastic and cause rupture (1). Based on research by Hidayat et al (2021) the longer a person suffers hypertension, the greater risk of stroke increasing 1.01 times (16). The result of this study also supported by research in China that hypertensive patients with systolic blood pressure ≥ 160 mmHg and diastolic blood pressure ≥ 100 mmHg had 225.8% risk of death (11). In this research the stroke mortality rate with renal failure was large but not higher than diabetes mellitus and hypertension. This statement supported by a research that says renal failure can be associated with stroke, but must be considered as a marker of severity and controlling factors underlying risks such as hypertension and diabetes mellitus (17).

In this research, stroke male patients with hypertension is higher with total 8047 deaths, this result supported by a research from Mutiarasari et al that men had more stroke (17.3%) than women (15.8%) (6). This presumably because men tend to have a lifestyle that increases blood pressure which can be caused by smoking habits. Where hypertension can be triggered by smoking, because of the nicotine content that causes an increase in adrenaline hormone which causes an increase in blood pressure (18). This smoking habit can cause severity and death in stroke patients.

While stroke patients with diabetes mellitus are higher in women. According Rexrode (2022) women with diabetes mellitus have a higher risk of stroke (15). This statement also supported by research conducted in the US that stroke women with diabetes mellitus have a worse prognosis (19).

The result of this research within two years were 2821 (8%) people who died

undergo operative management, while in patient who received non-operative management total deaths are 30700 (92%). This result supported by the statement of the Health Minister Republic of Indonesia decree in 2019 concerning national guidelines of medical services for stroke management, there are obstacles in managing stroke in Indonesia such as not all hospitals have diagnostic tools for stroke, not all hospitals have stroke unit and not all doctors and nurses in every hospital have skill to treat stroke. 83.9% deaths due to stroke were caused by pre-hospital delays, 62.3% were caused by patient late realizing early signs of stroke, causing the delays in pre-hospital treatment (20).

The research result showed that within two years more patients die in type B (50%) and C (35%) hospitals. This can happen due to late treatment of stroke, this can be caused by not all hospitals have diagnostic tools and doctors or nurses that don't have skill to manage a stroke. Based on referral flow by the decree of The Health Minister Republic of Indonesia in 2019, stroke patients who come to class C/D hospitals can be referred to class C/B/A hospitals that have diagnostic tools such as CT scan. Emergency patients can be referred to hospitals that have a CT scan and if the patient comes with indication of operative management, the patient can be referred to class A/B hospitals. This could be the reason why stroke patients that die is higher in class B hospitals, because patients with BPJS Health insurance who are referred from Puskesmas or class D/C hospital. In Indonesia there are more class B hospitals than class A hospitals.

The total annual costs based on the type of the treatment, in 2018 there is 12.181.781.496 rupiah were spent for 841

stroke patients who underwent operative management, while 1.533.090.964 were spent for 15.372 patients undergo non-operative management. In 2019, 13.963.025.156 rupiah were spent for 1980 stroke patients who undergo operative management, then 1.425.168.575 rupiah were spent for 15.328 stroke patients who undergo non-operative management.

CONCLUSION

Patients who died from strokes with BPJS Health insurance were 48% in 2018 and increased to 52% in 2019. Patients who died from strokes with BPJS Health insurance in 2018 and 2019 were higher in male (50,2%). The majority of patients who died from strokes with BPJS Health insurance had stroke risk factors in the form of hypertension (45%), followed by diabetes mellitus (41%) and kidney failure (14%). Only a small proportion of patients who died from strokes with BPJS Health insurance undergo operative management. Most of the patients who died from strokes covered by BPJS Health insurance in 2018 and 2019 occurred in type B hospitals. The total cost for treating stroke patients with BPJS Health insurance were very high (Rp 29.103.006.192)

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CONFLICT OF INTEREST

Author do not have a conflict of interest and doesn't have affiliations with any organization that could rise biased questions.

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