

Original Research Report

VASCULAR DEMENTIA PATIENTS CHARACTERISTICS WITH A HISTORY OF STROKE IN A NATIONAL BRAIN CENTER HOSPITAL JAKARTA, INDONESIA

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ABSTRACT

Stroke patients increase each year. Stroke is a cerebrovascular disorder caused by disruption of cerebral blood flow, which could reason vascular lesions within the mind parenchyma to be a threat to significant disorders. One of them is vascular dementia. Each affected person is prone to growing dementia after a stroke in three to five instances. This study aimed to decide the traits of patients with vascular dementia with a record of stroke. This study used a descriptive retrospective approach with a cross-sectional method. The samples were obtained from the total sampling technique. The sample of the study was vascular dementia patients with a stroke record at the National Brain Center Hospital Prof. Dr. dr. Mahar Mardjono, Jakarta, in the period of 2020 through the inclusion standards with 191 samples. This study found that the majority of patients were males as many as 129 (67.5%), age group of 55-64 were 67 patients (35.1%), post-ischemic strokes were 164 patients (85.9%), grade 1 hypertension as many as 70 patients (36.6%), and basal ganglia as many as 76 patients (29.23%). Characteristics of vascular dementia patients with the maximum stroke records in men, aged 55-64 years, post-ischemic stroke, grade 1 hypertension, and a majority of the lesions within the basal ganglia.

Keywords: Vascular dementia; history of stroke; characteristics; cardiovascular disease

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Hi j ni j tu

1. Characteristics of vascular dementia patients with a history of stroke was aimed.
2. The most characteristics of vascular dementia patients with stroke history are men, post-ischemic stroke, hypertension grade 1, and lesions in the basal ganglia.

INTRODUCTION

Stroke is a public health issue that keeps increasing each year. Stroke remains the third-leading cause of death, the second-main motive of demise motive and disability combined in the world (Feigin et al. 2022). Globally, one-third of 15 million human beings die because of stroke every year; and the rest experience permanent disability (Stroke Forum 2015). Based on the data, a wide variety of human population who have gotten stroke is around 713,783 people. Every affected person who has stroke record can get better or be pruned to experiencing significant issues from slight to severe symptoms (Basic Health Research 2018).

Many people continue to stay with their long-time period motor and exist after stroke, cognitive and touchy effects because of advances in intervention strategies (Donkor 2018). It regularly results in cognitive decline, even in stroke patients who underwent revascularization therapies (Lattanzi et al. 2020), starting from subjective cognitive decline to dementia (del Ser et al. 2005, van der Flier et al. 2018).

Stroke is harmful for the brain that looks sudden, progressive, and hasty because of non-traumatic cerebral blood circulation disorders. Stroke is divided into two, specifically ischemic stroke which is a result of a loss of blood delivery to a place in brain tissue because of blockage withinside the brain's arteries. In contrast, hemorrhage stroke which is a result of cerebral hemorrhage or subarachnoid hemorrhage caused by cerebral blood vessels rupture (Munir 2017).

The threat elements that affect the occurrence of stroke are divided into two, modifiable threat elements and non-modifiable threat elements. The threat elements that cannot be modified are heredity (genetic), race, age, and gender. Meanwhile, the threat elements that may be modified are diabetes mellitus, high blood pressure, hypercholesterolemia, and stress (Harsono 2015). However, some of the numerous elements that affect the occurrence of stroke such as the handiest high blood pressure, notably influence in the occurrence of stroke, when lipid degrees and smoking behavior were not notably related to the occurrence of stroke (Puspitasari 2020).

Vascular dementia (VaD) is a different cerebrovascular disease or subclinical or clinical cerebrovascular damage induced by a hemorrhagic or ischemic stroke (Li et al. 2021). VaD is the second most common cause of dementia in the elderly (Bir et al. 2021). Dementia can be caused by stroke. Some studies have proved stroke can cause loads of pathologies, along with the ones related to subcortical vascular dementia, multi-infarct dementia, and infarct dementia. Each affected person with a stroke record can be more susceptible to grow dementia in 3-5 instances than sufferers without a preceding stroke. Dementia that happens after a stroke is assessed as vascular dementia. After six months of stroke, the occurrence of vascular dementia is 20%, and signs grow with the dimensions of the lesions produced after stroke (Latri 2017). In fact, within the first 12 months after stroke, there is as much as a nine-fold extra danger of dementia, and the occurrence grows more thereafter (Desmond et al. 2002).

Vascular dementia is intently associated with numerous vascular mechanisms and adjustments withinside the brain. Vascular lesions within the brain parenchyma arise through ischemic, hemorrhagic, or an aggregate of those factors. Damage to the lesion within the brain manifests as signs of reminiscence impairment and impaired cognitive function (Emdin et al. 2016).

This study was conducted as an observation on the characteristics of patients with vascular dementia with a stroke history. This study was expected to benefit the health sector as a consideration in preventive interventions in stroke patients to reduce the incidence of vascular dementia and maintain or improve health status and quality of life in post-stroke patients. In addition, it could provide information about the characteristics of vascular dementia patients in patients with a history of stroke.

MATERIALS AND METHODS

This study used a cross-sectional method conducted at the National Brain Center Hospital Prof. Dr. dr. Mahar Mardjono, Jakarta, Indonesia. A cross-sectional study design is an observational study, where the exposures of the study participants and the investigator measure the results at the same time (Setia 2016). This study used medical records to be more adequate, and relevant but not excessive and uncollected to respond to the existing study. Secondary data analyses are not usually replicable (Border et al. 2019), robust to analytic choices (Botvinik-Nezer et al. 2020), or reproducible (Seibold et al. 2021). It is consequently essential for medical and societal progress (Baldwin et al. 2022). In this study, the data had been evaluated for certain criteria (Tripathy 2013).

The study was carried out from November to December 2021. The population in the study was patients with vascular dementia recorded in the medical

records from January to December 2020. The sampling used was total sampling technique.

This study utilized inclusion criteria and exclusion criteria, following the research criteria. The variables in this study were history of stroke as the independent variable and vascular dementia as the dependent variable. The instruments in this study were medical record data and CT scans along with the analysis results as a tool to see the location of lesions in patients with vascular dementia.

RESULTS

The research was conducted at the Neuro Medical Record Polyclinic of Prof. Dr. dr. Mahar Mardjono National Brain Center Hospital, Jakarta, Indonesia, from November 2021 to December 2021. Based on medical record data, vascular dementia patients with a history of stroke were 191 patients.

Table 1. Distribution of vascular dementia patients by age

Age (years)	Total	
	(n)	(%)
< 45 years	14	7.3
45-54 years	37	19.4
55-64 years	67	35.1
65-74 years	45	23.6
75-84 years	23	12.0
> 85 years	5	2.6
Total	191	100.0

Based on the table, there were 67 patients (35.1%) aged 55-64 years, 45 patients (23.6%) aged 65-74 years, 37 patients (19.4%) aged 45-54 years, 23 patients (12.0%) aged 75-84 years, 14 patients (7.3%) aged <45 years, and 5 patients (2.6%) aged >85 years.

Table 2. Distribution of vascular dementia patients by gender

Gender	Total	
	(n)	(%)
Male	129	67.5
Female	62	32.5
Total	191	100.0

The table above shows that the number of male patients was 129 patients (67.5%) and women were 62 patients (32.5%).

Table 3. Distribution of vascular dementia samples based on a history of hypertension

Hypertension	Total	
	(n)	(%)
Normal	14	7.3
Prehypertension	45	23.6
Hypertension Grade 1	70	36.6
Hypertension Grade 2	62	32.5
Total	191	100.0

History of hypertension in DVA patients with a history of stroke in the form of hypertension grade 1 was 70 patients (36.6%), hypertension grade 2 were 62 patients (32.5%), prehypertension was 45 patients (23.6%), and average (not hypertension) were 14 patients (7.3%).

Table 4. Distribution of vascular dementia samples by type of stroke

Types of stroke	Total	
	(n)	(%)
Post-Ischemic stroke	164	85.9
Post-Hemorrhagic stroke	27	14.1
Total	191	100.0

The history of stroke showed that there were 164 patients (85.9%) after ischemic stroke and 27 patients (14.1%) in post-hemorrhagic stroke.

Table 5. Distribution of samples of vascular dementia based on the location of the lesion

Lesions Location	Total	
	(n)	(%)
Frontal lobe	53	11.4
Parietal lobe	29	6.3
Occipital lobe	6	1.3
Temporal lobe	13	2.8
Basal Ganglia	76	16.4
Cerebellum	17	3.7
Thalamus	39	8.4
Pons	30	6.5
Frontotemporalis	3	.6
Frontoparietal	7	1.5
Parietotemporalis	3	.6
Parietooccipitalis	14	3.0
Temporooccipitalis	6	1.3
Interna Capsule	29	6.3
External Capsule	26	5.6
Insula lobe	31	6.7
Corona Radiata	31	6.7
Periventricular Lateral	23	5.0
Temporoparietal lobe	6	1.3
Frontotemporoparietal lobe	6	1.3
Temporoparietooksipital lobe	1	.2
Occipitalis lobe	3	.6
Mesencephalon	1	.2
Periventricular	5	1.1
Nucleus caudatus	5	1.1
Total	463	100.0

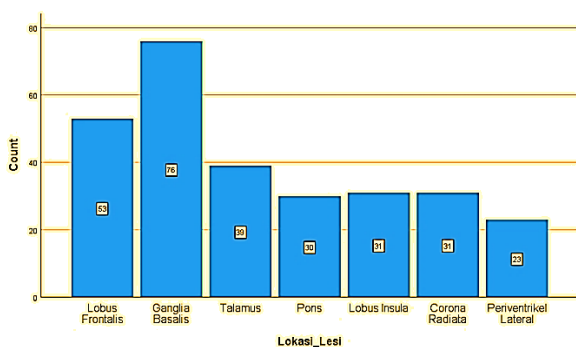


Figure 1. Distribution of samples of vascular dementia based on the location of the lesion

Based on the table, it can be concluded that the 5 most locations of lesions in vascular dementia patients with a history of stroke are as follows.

Based on the location of the lesion, it was concluded that there were five most significant groups of lesion locations, namely the location of the most lesions in the basal ganglia in 76 locations (29.23%), frontal lobes in 53 locations (20.38%), thalamus in 39 locations (15.00%), insula lobes in 31 locations (11.92%), corona radiata in 31 locations (11.92%), and pons in 30 locations (11.54%).

DISCUSSION

Based on the results in Table 1, it is recognized that most samples of vascular dementia with the aid of using age have been within the 55-64 years age group as many as 67 patients (35.1%), while the least at > 85 years were 5 patients (2.6%). The increase in age will result in impaired blood flow caused by degenerative processes and atherosclerosis in blood vessels in the brain (Tumeleng et al. 2015).

In Table 2, it can be seen that the distribution of vascular dementia samples by gender is the highest in males as many as 129 patients (67.5%), while in women only 62 patients (32.5%). This study's results are in line with research by Riyanto and Brahmahdi (2017), with 38 samples of vascular dementia found that 21 patients (57.9%) were male. This situation is related to smoking conduct in most men, which can cause atherosclerosis of blood vessels (Tumeleng et al. 2015).

In Table 3, the distribution of vascular dementia patients based on hypertension mainly is in grade 1 hypertension as many as 70 patients (36.6%). However, the least on average (non-hypertensive) were 14 patients (7.3%). Research performed on the elderly in the Integrated Healthcare Center (Posyandu) Dauh Puri Kelod Village found no statistically significant relationship between the degree of hypertension and impaired cognitive function.

Out of 70 samples, elderly with grade 1 hypertension there were as many as 40 people (57.1%), while there were those who with grade 2 hypertension with as many as 19 people (27.1%) and the remaining were 11 people (15.7%) with grade 3 hypertension. This study also found that from 47 people (67.1%) who experienced cognitive function disorders, 42 people had a history of hypertension for more than 5 years. Five people had a hypertension history for less than 5 years (Indrayani & Purnawati 2020). Based on a study, there were 46 people who had hypertension for ≥ 5 years; among them, 16 people (34.8%) had moderate dementia, 13 people (28.3%) did not experience cognitive impairment, and 17 people (37.0%) had



severe dementia (Rahmayanti 2018). This damage was due to the history of hypertensive patients which takes more than 5 years with lacunar infarctions in certain parts of the brain (Nurimah 2018).

However, there were several weaknesses: the sample of dementia vascular patients with a history of stroke, unknown history of treatment for hypertensive, the type of drug that might affect the results study and other factors that could affect dementia vascular in hypertensive patients. For future researchers, it is suggested to pay attention in describing the research results accurately in history of hypertension treatment, history of stroke, types of drugs that can affect research results, and other factors that can affect vascular dementia in hypertensive patients is recommended.

Based on Table 4, the distribution of patients with vascular dementia was most common in patients after ischemic stroke, 164 patients (85.8%) compared to 27 patients (14.1%) after a hemorrhagic stroke. This result was in line with the research of Tini and Surya (2021) which found that 42 people (68.8%) had ischemic stroke and 19 people (31.2%) had a hemorrhagic stroke. Twelve of the 31 patients with possible dementia had dementia, and 18 patients had no cognitive impairment.

However, another study conducted by Riyanto and Brahmahdi (2017) also found that the number of dementia patients was higher in a sample of post-hemorrhagic stroke patients than in a sample of post-ischemic stroke patients. From 35 samples of patients with post-hemorrhagic stroke, 29 patients (41.23%) had dementia and 6 patients (8.57%) did not have dementia. The difference in the results of this study was associated with the dominant factors in the occurrence of post-stroke cognitive function disorders in the form of multiple stroke onset lesions and lesions location (Pinzon et al. 2018). Based on Figure 1, the lesion location in patients with vascular dementia mainly occurred in the basal ganglia with 76 locations (29.23%), the frontal lobe with 53 locations (20.38%) and thalamus with 39 locations (15.00%).

A research that found that patients with lesions in the white matter of the frontal gyrus, basal ganglia, and thalamus could affect impaired cognitive function strengthens the argument in this study. Basal ganglia has a dominant role in knowledge, perceptual decision making, and absent motor pathways such as fluency, cognition, and behavior (Zhao et al. 2018). In addition, the results of this study were supported by Wang et al. (2016) study which found that the presence of infarcts in the white matter in the frontal lobe, basal ganglia, and thalamus were associated with the appearance of impaired cognitive function.

Simpulan dan Kesimpulan

Terdapat 191 sampel yang diskrining untuk demensia vaskular dengan riwayat stroke, ditemukan bahwa jumlah tertinggi pasien adalah laki-laki sebanyak 129 pasien (67,5%), post-ischemic stroke sebanyak 164 pasien (85,9%), hipertensi grade 1 sebanyak 70 pasien (36,6%), 55-64 tahun sebanyak 67 pasien (35,1%), dan basal ganglia sebanyak 76 pasien (29,23%).

CONCLUSIONS

Of the 191 samples who were screened for vascular dementia patients with a history of stroke, it was found that the highest number of patients was male as many as 129 patients (67.5%), post-ischemic stroke as many as 164 patients (85.9%), grade 1 hypertension as many as 70 patients (36.6%), 55-64 year-old group as many as 67 patients (35.1%), and basal ganglia as many as 76 patients (29.23%).

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Conflict of interest

None

Funding disclosure

None

Author contribution

AMH dan TXA melakukan pengumpulan data, analisis data, dan penulisan naskah. HO melakukan analisis data, penulisan naskah, dan penyuntingan. S melakukan analisis data, penulisan naskah, dan penyuntingan. Y melakukan analisis data, penulisan naskah, dan penyuntingan. G melakukan analisis data, penulisan naskah, dan penyuntingan. H melakukan analisis data, penulisan naskah, dan penyuntingan.

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