

THE DISEASE PATTERN OF ELDERLY PATIENTS ADMITTED IN THE NEUROLOGY WARD OF HASAN SADIKIN GENERAL HOSPITAL

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ABSTRACT

Background: As life expectancy continues to increase, the elderly population in Indonesia has significantly doubled in the last five decades, making Indonesia a home to 4th largest population of elderly people in Asia. Unlike other age group, there are more challenges in handling older persons due to their increased mortality, morbidity, and disability risks.

Objective: We performed this study to understand the disease pattern in elderly patients admitted in the neurology ward of Hasan Sadikin General Hospital.

Methods: This was a descriptive cross-sectional study using data from medical resume. We included medical resume of elderly patients admitted in the neurology ward of Hasan Sadikin General Hospital from January 2015 to December 2019. All incomplete, lost, or inaccessible medical resumes were excluded.

Results: Among a total of 400 subjects, 210 (52.5%) were males and 190 (47.5%) were females. Young old (59.5%) presented to be the most observed age group. The most frequent diseases of elderly patients seen in this study were ischemic stroke (55.3%), followed by hemorrhagic stroke (19.5%), subarachnoid hemorrhage (5.3%), and tetanus (4.5%). Atherothrombotic subtype (50.6%) of ischemic stroke was seen to be the most frequent.

Conclusion: Noncommunicable diseases were the majority of all cases in the elderly with cerebrovascular diseases, such as stroke and subarachnoid haemorrhage, as the most common conditions. It is important to develop efficient hospital-based management strategies particularly for these diseases and intensify early detection and management of risk factors.

Keywords: Elderly, Neurological disorders, Hospital prevalence

Introduction

Major health-care efforts continue to improve in maintaining the lives of elderly patients, resulting sustained increase in life expectancy (LE) worldwide. This fact reflects declines in mortality rate and at the same time world population growth.¹ Consequences ensue as the result of these demographic changes where the world has to face the transition of health problems from communicable diseases (CDs) to noncommunicable diseases (NCDs). NCDs are chronic diseases as a result of the combination of genetic, physiological, environmental, and behavioural factors. At the moment, NCDs are responsible for 71% of all deaths worldwide, with heart diseases, stroke, cancer, diabetes mellitus (DM), and chronic lung disease as the top leading diseases consecutively.²

The same phenomenon also applies in Indonesia where LE has steadily increased for the past decade.³ In 2019, LE in Indonesia has reached 69,44 years for male and 73,33 years for female.⁴ Along with LE increase, elderly population in Indonesia has significantly doubled to 9,6% (25,66 million) for the past five decades⁵, making Indonesia the 8th largest

population of elderly people in the world, and 4th largest among Asian countries.¹ It appears that currently Indonesia is undergoing transition to ageing population and by the year of 2030, it is projected that Indonesia will become a country with ageing population where elderly population will reach 13,82%.^{3,5}

Elderly is someone who has reached the age of 60 or older.^{3,5} BPS (*Badan Pusat Statistik*, or the Central Bureau of Statistics) categorize elderly as young old (60-69 years), middle old (70-79 years), and very old (≥80 years).⁵ Unlike other age group, there are more challenges in handling older persons due to the fact there is time-related process of changing called aging. The changes that occur placing the elderly in a more vulnerable condition to pathologic process, which then having influence in the increase of morbidity and mortality rate and risk of disability.⁶ With repercussions that come with these changes, there is a growing need to collect data and gather evidence for management policy purposes. Global Burden of Diseases Study 2016 has displayed burden of diseases by measuring healthy life years lost due to specific disease in the form of disability-adjusted life year (DALY) and it was reported that neurological disorder

supply the most considerable contribution (11.8%) as a cause of global DALY.⁷ Neurological disorder often occurs in elderly patients and affects 5% to 55% of the population aged 55 years or older.^{8,9} Meanwhile in Indonesia, stroke occurred the most frequently and is the third most common health problems experienced by the elderly.³

Recognizing the urgency of these predicaments, therefore, in order to develop effective and efficient preventive measures and management strategies, it is important to know the pattern of neurological diseases in elderly patients. The data that will be presented in this study are expected to provide an overview of disease pattern in elderly patients admitted in the neurology ward to the clinicians and researchers and to assist them in developing further management for the better welfare of elderly people.

Methods

This was a descriptive cross-sectional study using data from medical resume. We included medical resume of elderly patients (60 years and older) admitted in the neurology ward of Hasan Sadikin General Hospital from January 2015 to December 2019. All incomplete, lost, or inaccessible medical resumes were excluded. The sample size was determined based on the equation for categorical descriptive study with precision (d) of 5%, making the minimum number of subjects to be 384 subjects. Sample selection was done with consecutive sampling. From all samples, some data were extracted as follows: age, sex, and final diagnosis. Results are presented in percentage.

This study has received ethical clearance from KEP FK Unpad (*Komisi Etik Penelitian Fakultas Kedokteran Universitas Padjadjaran*), or the Commission of Research Ethics, Faculty of Medicine, University of Padjadjaran) No. 771/UN6.KEP/EC/2020.

Results

Four hundred patients were observed during this study period. Table 1 presents the frequency distribution of patients' characteristics consisting of age and sex.

Of all patients, there were 210 (52.5%) males and 190 (47.5%) females, giving a sex ratio (M:F) of 1.11:1. The age range of the patients was from 60 years to 93 years with a mean (\pm SD) of 69.00 ± 6.98 . The age distribution of the patients was categorized based on BPS and the result shows the young old were the most common (59.5%), followed by middle old (33.3%) and very old (7.3%).

The ten leading diseases in elderly patients are shown in Table 2. The most common disease of elderly patients in the neurology ward of Hasan Sadikin General Hospital was ischemic stroke (55.3%), followed by hemorrhagic stroke (19.5%), subarachnoid hemorrhage (5.3%), tetanus (4.5%), secondary tumor space occupying lesion (SOL) (4%), metabolic encephalopathy (2.8%), primary tumor SOL (2%), Guillain-Barré syndrome (1.3%), tuberculous meningitis (0.8%), and myeloradiculopathy (0.8%).

Two hundred and twenty one patients were diagnosed as having ischemic stroke, making this disease as the most frequently observed in elderly patients admitted at the neurology ward. Its subtypes are presented in Table 3, with atherothrombotic (50.6%) as the most common, followed by

cardioembolic (31.7%), thromboembolic (13.6%), embolic shower (2.3%), and lacunar (1.8%).

Of all patients, 73% came with hypertension, making it the leading risk factor in this study. The majority came from patients with stroke (89.1%), confirming it to be the main risk factor of stroke as well, to both ischemic (86.4%) and hemorrhagic (96.2%), followed by dyslipidemia (36.6%), and type 2 diabetes mellitus (16.9%).

It was also revealed that patients with cardioembolic subtype of ischemic stroke also had underlying heart conditions, namely atrial fibrillation (47.1%), coronary artery disease (28.6%), diastolic dysfunction (7.1%), rheumatic heart disease (1.4%), and other conditions mainly hypertensive heart disease.

Table 1. Characteristics of elderly patients admitted in the neurology ward

Characteristics	Elderly patients in neurology ward (n = 400)	
	n	%
Sex		
Male	210	52.5
Female	190	47.5
Age		
Young Old (60-69 years)	238	59.5
Middle Old (70-79 years)	133	33.3
Very Old (\geq 80 years)	29	7.3

Table 2. Ten leading diseases in elderly patients admitted in the neurology ward of Hasan Sadikin General Hospital

Ten leading diseases	Elderly patients in neurology ward (n= 400)	
	n	%
Ischemic stroke	221	55,3
Hemorrhagic stroke	78	19,5
Subarachnoid hemorrhage	21	5,3
Tetanus	18	4,5
Secondary tumor SOL	16	4
Metabolic encephalopathy	11	2,8
Primary tumor SOL	8	2
Guillain-Barré syndrome	5	1,3
Tuberculous meningitis	5	1,3
Myeloradiculopathy	3	0,8

Table 3. Ischemic stroke subtype

Ischemic stroke subtype	Elderly patients in neurology ward (n = 221)	
	n	%
Atherothrombotic	112	50,6
Cardioembolic	70	31,7
Thromboembolic	30	13,6
Embolic shower	5	2,3
Lacunar	4	1,8

Discussion

The characteristics of elderly patients who were treated in the neurology ward of Hasan Sadikin General Hospital are similar to a study conducted at Soetomo General Hospital, Surabaya, where the proportion of male patients (57.2%) was higher than female patients (43.7%).¹⁰ If we compared to national report, the result was similar. It was reported that 8.89% of elderly people in Indonesia had been admitted to inpatient treatment at least once, and male prevalence (9.66%) was higher than female (8,18%).

In spite of that fact, Indonesia's female elderly prevalence (52.35%) was reported to be actually higher than male (47.65%).⁵ This fact leaves behind a question as to why male population that needed inpatient treatment was higher. From national report it was revealed then that elderly males tended to have more risk factors than female. The tendency to smoke was much higher than female when smoking is a risk factor to plenty of health conditions, namely respiratory problems, vascular diseases, cancer, and even death. It was also revealed that male has the tendency to have bad eating habits (sweet, savory, fatty, and processed foods and alcoholic beverage) more than female.¹¹

Young old (59.5%) was the most common age group in this study. Based on national report, middle old was the majority in elderly population.⁵ This difference isn't significant and actually is compatible with the present rate of LE in Indonesia, namely 69.44 (young old) for men and 73.33 (middle old) for women.⁴ As LE continues to increase, it can be assumed that a few years later the characteristics of elderly patients treated in the neurology ward may also change.

From all the ten leading diseases presented in Table 2, NCDs dominated this study with only two communicable ones. This result shows there was a shift from communicable to noncommunicable diseases as reported in Indonesia Basic Health Report in 2018, where the incidence of NCDs tended to start increasing from the age group of 10-14 years until it reaches its peak in the productive age group and continues to be high until the elderly age group.¹¹ These conditions could affect all age groups, but often associated with older age groups due to its long course of disease and the uniqueness of elderly physiology.² Unpreventable condition in the elderly is the aging process. Aging is a time-related process of changing in organisms. The changes that occur, both at the molecular and cellular level, cause a decrease in daily functional physiological process and the individual's ability to respond to stress, causing them to be more vulnerable to pathologic condition.⁶ In addition, the changes that occur also associated with degenerative diseases, mainly neurodegenerative, due to mechanisms related to vascular pathology, cellular senescence, body-brain trophic interactions, lifespan gut dysbiosis, and genetic factors.¹²

In this study, cerebrovascular diseases, especially stroke, were the most frequent conditions requiring treatment in the neurology ward. Similar results were shown in a study conducted at Soetomo General Hospital. Based on national report, stroke was the most common neurological disorder that occur to elderly people in Indonesia.³ Previous other studies in several countries in Asia have shown similar pattern of neurological disorders as well, revealing stroke as the most common disease.^{13,14} Stroke itself is the leading cause of disability and death worldwide, particularly in Asia, the continent which majorly filled with developing countries.¹⁴ In this study, ischemic stroke was the most common, demanding a more thorough attention with atherothrombotic (50,6%) as the most common subtype. In Indonesia Stroke Registry, with eleven hospitals involved in the study, ischemic stroke was also reported to be the majority of stroke cases.¹⁵ It is also consistent with studies that have been carried out in several countries in Asia.^{16,17}

Hypertension remained as the main risk factor to both subtype of stroke in this study, consistent with Indonesia

Stroke Registry.¹⁵ Furthermore, the prevalence of hypertension in Indonesia has reached 34.11% in 2018, increasing significantly from 2013 with a prevalence of 25.8%.^{11,18} In addition to being a risk factor for stroke, hypertension is also a risk factor for subarachnoid hemorrhage.¹⁹⁻²¹ In accordance with these facts, subarachnoid hemorrhage occupied the third most common condition in elderly patients after ischemic stroke and hemorrhagic stroke in this study.

Despite the significant shift to NCDs, there were still CDs found in this study, namely tetanus and tuberculous meningitis. Tetanus is an acute infection caused by spores of *Clostridium tetani* that are found everywhere in the environment, particularly in soil, feces of humans or animals, surfaces of skin, and rusty tools. This disease commonly occurs to unvaccinated individuals or in the elderly with waning immunity. Despite national vaccination program, the incidence remained high due to inadequate information and poor people's knowledge about the risk of infection.²² In addition, more than half of the elderly in Indonesia were reported to be working in agricultural sector, increasing the risk of exposure to contaminated soil or tools.⁵ Tuberculous meningitis (TBM) is the most severe form of extrapulmonary tuberculosis (TB), an infection caused by *Mycobacterium tuberculosis*. TBM can occur as the sole manifestation or concurrent with other sites of infection.²³ TB is still a major health problem worldwide, particularly to underdeveloped and developing country. Indonesia accounted for 8,5% TB total burden in 2019, seizing the title of the country with the second largest TB infected population.

Conclusion

The conclusion that can be drawn from this study is in elderly patients, it is to be expected NCDs would be the majority of the cases, with cerebrovascular diseases, such as stroke and subarachnoid haemorrhage as the most common conditions. High national prevalence rendered hypertension the main risk factor for these diseases as seen in this study. Based on these results, it is important to develop hospital-based management strategies, particularly for these diseases. In addition, it is no less important to intensify early detection and management of risk factors to prevent diseases requiring treatment in the neurology ward.

This study only showed the pattern of diseases that has occurred in the neurology ward. Most of the times, elderly patients present with varied clinical presentation of diseases and multiple diagnosis. Therefore, it is better if further research is carried out that covers overall disease pattern of elderly patients in all departments in Hasan Sadikin General Hospital, particularly for department of neurology, internal medicine, and cardiology.

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Conflict of Interest

The authors affirm no conflict of interest in this study.

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