The comparison of risk factor between the young adult and elderly onset of ischemic stroke

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Abstract

Background: Young adults are likely to distinguish risk factor from elderly concerning ischemic stroke.

Aims and Objective: Measure the comparison of risk factor between the young adult and elderly onset of ischemic stroke.

Material and Methods: This was a cross sectional study using secondary data from electronic medical record and electronic stroke registry of Bethesda Hospital Yogyakarta Indonesia. The stroke was diagnosed with standard way by well-trained neurologist and confirmed with CT Scan. The risk factors were defined systematically. We used OpenEpi sample size calculation and Statistical Package for Social Sciences version 20 with significance level 0,05.

Results: The data of 200 subjects consisted of 100 patients aged under 50 years and 100 patients aged above 50 years. Patients in the elderly group more frequently had atrial fibrillation (92,3% vs 7,6%, p= 0.001). On the other hand, the elderly group more often dyslipidemia (52,1% vs 47,9%) and ischemic heart disease (75% vs 25%). Diabetes and hypertension are more common in young onset compare the old one (57,1% vs 42,9% and 57,6% vs 42,4%). There was not a significantly different risk's factor include dyslipidemia, ischemic heart disease, diabetes and hypertension both of the group.

Conclusion: Atrial fibrillation is the leading risk factor for ischemic stroke, particularly in elderly patients. These findings suggest specializing stroke care to secondary prevention in patient with risk factors.

Key words: ichemic stroke, age group, risk factors

ИШЕМИЯЛЫҚ ИНСУЛЬТ БАСТАЛУ КЕЗІНДЕ ЖАСТАР МЕН ЕГДЕ АДАМДАРДА ҚАУІП ФАКТОРЛАРЫН САЛЫСТЫРУ

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ТҰЖЫРЫМДАМА

Кіріспе: Жас адамдар егде адамдарға қарағанда ишемиялық инсультқа қатысты қауіп факторын айыруға қабілетті.

Мақсаты мен міндеттері: Ишемиялық инсульт басталу кезінде жастар мен егде адамдар арасындағы қауіп факторын салыстыруды бағалау.

Материалдар мен әдістер: Бұл Бетесда клиникасының (Джокьякарта, Индонезия) инсульттары бойынша электрондық медициналық карталар мен электрондық Тізілімнен қайталама деректерді пайдаланумен көлденең зерттеу болды. Инсультті жоғары білікті невролог дәстүрлі әдіспен диагностикаланды және компьютерлік томография зерттеуімен расталды. Қауіп факторлары жүйелі түрде анықталды. Біз OpenEpi іріктемесінің көлемін есептеуді және қоғамдық ғылымдардың статистикалық деректерін өңдеу бағдарламасы пакетін (20-шы нұсқасы, 0,05 мәнділігі деңгейімен) пайдаландық.

Нәтижелері: 200 зерттеліп жатқандар туралы деректер 50 жасқа дейінгі 100 пациенттен және 50 жастан үлкен 100 пациенттерден тұрады. Үлкен жастағы топтың пациенттерінде жүрекше фибрилляция (92,3% қарсы 7,6%, р= 0.001) жиірек кездесті. Екінші жағынан, осы топтың пациенттерінде дислипидемия (52,1% қарсы 47,9%) және жүректің ишемиялық ауруы (75% қарсы 25%) жиірек кездесті. Диабет пен гипертензия егде жастағы адамдармен салыстырғанда жастар арасында аса таралған (57,1% 42,9%-ға қарсы және 57,6% 42,4%-ға қарсы). Екі топтардағы дислипидемияны, жүректің ишемиялық ауруын, диабет пен гипертензияны қосқанда, қауіптің айтарлықтай түрлі факторлары табылмады.

Қорытынды: Жүрекше фибрилляциясы ишемиялық инсультқа, атап айтқанда егде пациенттерде қауіптің негізгі факторы болып табылады. Осы нәтижелер қауіп факторлары бар пациенттерде қайталама профилактика үшін инсультті мамандандырылған емдеуді қамтиды.

Негізгі сөздер: ишемиялық инсульт, жас ерекшелігі тобы, қауіп факторлары

СРАВНЕНИЕ ФАКТОРОВ РИСКА У МОЛОДЫХ И ПОЖИЛЫХ ЛЮДЕЙ ПРИ НАСТУПЛЕНИИ ИШЕМИЧЕСКОГО ИНСУЛЬТА

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РЕЗЮМЕ

Введение: Молодые люди более способны отличить фактор риска касательно ишемического инсульта, чем пожилые люди.

Цели и задачи: Оценить сравнение фактора риска между молодыми и пожилыми людьми при наступлении ишемического инсульта.

Материалы и методы: Это было поперечное исследование с использованием вторичных данных из электронных медицинских карт и электронного Реестра по инсультам Клиники Бетесда, Джокьякарта, Индонезия. Инсульт был диагностирован традиционным методом высококвалифицированным неврологом и подтвержден исследованием компьютерной томографии. Факторы риска были определены систематически. Мы использовали подсчет объема выборки OpenEpi и пакет программ обработки статистических данных общественных наук, версия 20, с уровнем значимости 0,05.

Результаты: Данные о 200 исследуемых состояли из 100 пациентов в возрасте до 50 лет и 100 пациентов старше 50 лет. У пациентов в группе старшего возраста чаще встречалась предсердная фибрилляция (92,3% против 7,6%, p= 0.001). С другой стороны, у пациентов этой группы чаще встречалась дислипидемия (52,1% против 47,9%) и ишемическая болезнь сердца (75% против 25%). Диабет и гипертензия наиболее распространены среди молодых в сравнении с пожилыми (57,1% против 42,9% и 57,6% против 42,4%). Значительно различных факторов риска не было обнаружено, включая дислипидемию, ишемическую болезнь сердца, диабет и гипертензию в обеих группах.

Заключение: Предсердная фибрилляция является основным фактором риска для ишемического инсульта, в особенности у пожилых пациентов. Данные результаты предполагают специализированное лечение инсульта для вторичной профилактики у пациентов с факторами риска.

Ключевые слова: ишемический инсульт, возрастная группа, факторы риска

Introduction

Stroke is one of the most public health concerns worldwide as it is the leading cause of disability [1]. In Indonesia, stroke is the number one cause of hospital death [2,3]. Stroke survivors will have limitation in physical, psychological, and social functions [4].

Although stroke is a disease associated with old age, recent studies suggest that rates of stroke in younger population (<50 year age) has been increasing [5]. The Dijon Stroke Registry, a French population-based study, also found a rise in the incidence of ischemic stroke in individuals age <55 years from 8.1 in 100 000/year in 1985–1993 to 10.7 in 100 000/year in 1994–2002, and to 18.1 in 100 000/year in 2003–2011 [6]. Also a greater incidence of young stroke was reported in developing countries ranging from 45 to 70 in 100,000 people/year [7-9].

The prevalence of standard modifiable vascular risk factors in young stroke patients is different from that in older patients. Modifiable risk factors for stroke, such as dyslipidemia, smoking and hypertension are highly prevalent in the young stroke population [10]. In another study, hypertension, heart disease (including atrial fibrillation) and diabetes mellitus are the most common risk factors among the elderly [11]. The understanding about comparison between each risk factor will help physicians to make a good decision in managing the disease [10].

The studies about stroke risk factor in Indonesia are very limited. The hospital based epidemiological data are limited. The aim of this study was to measure the comparison between the young adult and elderly onset of ischemic stroke.

Materials and methods

This was a cross sectional study using secondary data from electronic medical record and electronic stroke registry of Bethesda Hospital Yogyakarta Indonesia. The stroke was diagnosed with standard way by well-trained neurologist and confirmed with CT Scan. We used OpenEpi sample size calculation. The proportion of dyslipidemia in young adult is 34,4% and the proportion of dyslipidemia in elderly onset is 23,6%. The calculation showed that minimal sample in each group is 100.

The risk factors were collected form electronic medical record and electronic stroke registry. Atrial fibrillation was present if the patient was previously diagnosed by a cardiologist or if the arrhythmia was found on a short ECG record performed on admission. Dyslipidemia was defined as the use of lipid lowering agents or a serum cholesterol level >200 mg/dl or LDL level above 100 mg/dL, or triglyseride level above 150 mg/dL in fasting condition. Ischemic heart disease was defined as history of acute myocardial infarction or angina pectoris. The hypertension was defined as the blood pressure > 140/90 in more than two visits or in consumption of antihypertensive medication. The diabetes was defined as fasting glucose level more than 110 mg/dL or post prandial more than 180 mg/dL, or taking oral anti diabetic/insulin.

The data were presented in descriptive and analytic way. We used OR (Odds Ratio) and 95% Confidence Interval to show the comparison. We used SPSS version 20 to calculate the significance level (p<0,05%).

Ethical clearance for conducting the study was obtained from the ethic committee, Duta Wacana Christian University School of Medicine Yogyakarta, Indonesia. The Number for ethical clearance is 552/C.16/FK/2017.

Results

The data of 200 subjects consisted of 100 patients aged under 50 years and 100 patients aged above 50 years. The characteristic of risk factors in stroke patients are shown in Table 1. The elderly patients are more often atrial fibrillation, dyslipidemia and ischemic heart disease. Hypertension and Diabetes are more in young onset compare the old one.

The comparative analysis of risk factor between the young adult and elderly onset of ischemic stroke were shown in Table 2. This study showed that patients in the elderly group had more frequently atrial fibrillation (OR 2,297, 95% CI: 1.897 ;2.772, P<0,001). There was not a significantly different risk's factor include dyslipidemia, ischemic heart disease, diabetes and hypertension both of the group.

Discussion

The main purpose of this study was to measure the comparison between the young adult and elderly onset of ischemic stroke. The results of our cross sectional suggest that atrial fibrillation is the significant vascular risk factor that was found to be more common in the elderly population than in the young adults. In a study conducted Clinic of Neurology,

Table 1   Risk factors of ischemic stroke in the two age groups

Variable	Age				Total	
	≤ 50 years old		>50 years old			
	N	%	n	%	N	%
Atrial Fibrillation						
Yes	2	7.6%	24	92.3%	26	100%
No	98	56.3 %	76	43.6%	174	100%
Dyslipidemia						
Yes	45	47.9%	49	52.1%	94	100%
No	55	51.9%	51	48.1%	106	100%
Ischemic Heart Disease						
Yes	3	25%	9	75%	12	100%
No	97	51.6%	91	48.4%	188	100%
Hypertension						
Yes	49	57.6%	36	42.4%	85	100%
No	51	44.3%	64	55.7%	115	100%
Diabetes						
Yes	24	57.1%	18	42.9%	42	100%
No	76	48.1%	82	51.9%	158	100%

Table 2   The comparative analysis of risk factor between the young adult and elderly onset of ischemic stroke.

Predicators	OR	95 CI	P Value
Atrial Fibrillation	2.297	1.897 ; 2.772	0.001
Dyslipidemia	0.852	0.488 ; 1.485	0.571
Ischemic Heart Disease	0.313	0.082 ; 1.191	0.074
Hypertension	1.708	0.970 ; 3.009	0.063
Diabetes	1.439	0.724 ; 2.857	0.298

Hyogo Brain and Heart Center at Himeji Japan, patients in the older group more frequently had atrial fibrillation (35.2% versus 24.7%, p= 0.018) [12]. Similarly, previous studies have found that there was a significantly higher proportion of atrial fibrillation in older onset comparing with the young adults (25% versus 10,2%, p = 0.002) [13].

The progressive loss of conduction tissue cells and pacemaker function accounts for the increased incidence of atrial fibrillation in the elderly [14]. There is a high prevalence of atrial fibrillation and heart diseases (including coronary heart diseases, arrhythmia and chronic heart failure) in elderly patients, which makes cardiogenic embolism a more frequent cause of ischemic stroke [15]. Some studies suggested that atrial fibrillation might supercede hypertension to be the primary risk factor for ischemic stroke in patients aged over 80 or 85 years [13]. Therefore, early recognition and intensive control of heart diseases, especially using warfarin, are of critical importance in reducing the incidence of ischemic stroke in the elderly.

Younger patients tend to have lower incidence of atrial fibrillation associated co-morbidities such as hypertension, heart failure and structural heart disease that are frequently encountered in elder patients with atrial fibrillation. Other lifestyle related factors such as alcohol use, obesity, physical activity and genetic risk factors play a significant role in the pathogenesis of atrial fibrillation in young [16].

This study found that dyslipidemia were more found in elderly onset (52,1% vs 47,9%) Table 1. Previous studies had shown that dyslipidemia more common in elderly onset [17-18]. Triglyceride levels increase with age and reach a peak in men age 50-59 and in women age 60-69 years. Apolipoprotein B also increases progressively with age and this increase is associated

with an increased prevalence of small dense LDLc [19]. In contrast to other studies showed that dylipidemia are highly prevalent in the young stroke population. [20-21] There was no statistically significant difference considering the prevalence of dyslipidemia between the young adult and elderly onset (P=0,571). This increasing tendency of dyslipidemia in young adults could be the result of changes in lifestyle and eating habits of the young people.

This study found that ischemic heart disease were more found in elderly onset (75% vs 25%) Table 1. Previous study showed that ischemic heart diseases were more frequent in middle age (50-80 years) and very old (>80 years) patients [22]. Atherosclerosis is the main cause of coronary heart disease and a major cause of ischemic stroke. In the Reduction of Atherosclerosis for Continued Health (REACH) study, established coronary heart disease was present in 37.9% of the patients with ischemic stroke or transient ischemic attack [23]. There was no statistically significant difference considering the prevalence of ischemic heart disease between the young adult and elderly onset (P=0,074). This increasing tendency of ischemic heart disease in young adults could be the result of changes in lifestyle and eating habits of the young people.

This study found that hypertension more found in young adults (57,6% vs 42,4%). Tabel 1.

Previous study showed that hypertension were more frequent in young adults. [10,12,24]. In contrast to other studies showed that hypertension is the most common risk factors among the elderly [11,25]. There was no statistically significant difference considering the prevalence of hypertension between the young adult and elderly onset (P=0,063). The discord between different studies may be resulted from the different racial and

environmental factors in the pathogenesis of hypertension.

This study found that diabetes were more found in young adults (57,1% vs 42,9%). Table 1. Previous studies had shown that diabetes more common in young adults [13,26-27]. In contrast to other studies showed that diabetes is the most common risk factors among the elderly [11]. There was no statistically significant difference considering the prevalence of dyslipidemia between the young adult and elderly onset (P=0,298). Risk for stroke is actually higher in the young population with diabetes. According to data from the Greater Cincinnati/Northern Kentucky stroke study, diabetes increases ischemic stroke incidence in all age groups, but this risk is most striking before the age of 55 years in African Americans and before the age of 65 years in Whites [28] .

The limitation of this study was the use of cross sectional method. We could not clarify the duration and sustainability of treatment for each risk factor. The recognition and control of atrial fibrillation should also be taken seriously in elderly population. Additionally, young adults with a history of vascular events should be educated early to control risk factors effectively.

Conclusion

Finally, it can be concluded that atrial fibrillation is the leading risk factor for ischemic stroke, particularly in elderly patients. Hence, early recognition and intensive control of atrial fibrillation are of critical importance in reducing the incidence of ischemic stroke in the elderly. On the other side, dyslipidemia, ischemic heart disease, hypertension and diabetes are the risk factor modification of stroke. They are commonly seen not only in elderly patients but also in younger patients. However, these conditions are affected by many factors, such as diet and today's unhealthy lifestyle. Therefore, by conducting this research, we suggest specializing stroke care to secondary prevention in patient with risk factors.

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Authors Contribution:

RP - Concept and design of the study, manuscript preparation, statistically analyzed and interpreted, critical revision of the manuscript.

FB - Concept and design of the Study, collected data, preparing first draft of manuscript, critical revision of manuscript and review of the study.

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