Epidemiology of Stroke in the Elderly in Thailand

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Abstract

Epidemiology of stroke in the elderly in Thailand was conducted from August 1994 to October 1996. The total of 3,036 Thai elderly were included in this study. They represented the elderly population from four regions; Central Region (615 elderly, Nakhon Pathom Province), Northern Region (840 elderly, Lampang Province), North-Eastern Region (706 elderly, Sakon Nakhon Province), and Southern Region (857 elderly, Ranong Province). All elderly in these selected areas received general physical examinations and complete neurological examinations from neurologists. Demographic data concerning each individual was recorded by specially trained nurses. Data included age, sex, occupation, education, drug usage, alcohol, smoking and pre-existing diseases. Blood was taken from each subject for complete blood count, fasting blood sugar, cholesterol, triglyceride, high density lipoprotein cholesterol and VDRL. Data on physical examinations were recorded with particular attention to blood pressure, carotid bruit, cardiac murmurs, cardiac arrhythmia, speech, posture, gait, frontal lobe releasing signs, Babinski sign and focal neurological deficit.

Thirty-four stroke patients were identified from 3,036 elderly (prevalence rate of 1.12 per cent). There were 12 stroke patients from Central Region (prevalence rate of 1.99 per cent), 5 from Northern Region (0.6 per cent), 4 from North-Eastern Region (0.6 per cent) and 13 from Southern Region (1.5 per cent). Hypertension was the main risk factor for stroke in this study whereas diabetes mellitus, smoking, alcohol consumption, hyperlipidemia and underlying heart diseases were insignificant risk factors. The prevalence of hypertension in Thai elderly was ranging from 16.7 to 47.2 per cent (criteria over 140/90 mmHg) or 6.1 to 24.8 per cent (criteria over 160/90 mmHg). Prevalence of smoking and alcohol consumption in Thai elderly ranged form 19.5 per cent (Sakon Nakhon) to 62.1 (Lampang) and 16.75 per cent (Nakhon Pathom) to 33.70 per cent (Lampang) respectively. Data from physical examinations revealed that dysarthria, hemiplegic gait and Babinski sign were the significant signs for diagnosis of stroke in the community setting. The prevalence of carotid bruit, cardiac murmur and cardiac arrhythmia were ranging from 1.3 to 1.8 per cent, 3.1-7.1 per cent and 0.8-1.4 per cent respectively.

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From this study, it can be concluded that stroke prevention is the best policy for stroke management. Stroke prevention measures should thus be aimed at the high risk elderly group. This is best achieved by identifying risk factors among them and then controlling these risk factors properly.

Stroke or cerebrovascular disease is an important cause of mortality and a major source of morbidity with a high estimated cost world-wide. Stroke is an important and common medical emergency during which patients need to be admitted and properly treated in hospital in both developed and developing countries. Perhaps stroke is one of the neurological disorders in which epidemiology has made the greatest contribution. In addition to delineating the major risk factors for stroke, there is evidence to suggest that modifying these risk factors has helped produce a decline in mortality and morbidity due to the condition[1].

In Thailand there have been only two community studies concerning the epidemiology of stroke[2,3]. One study was conducted in Bangkok Metropolitan area in 1983 and revealed that stroke prevalence rate is 690/100,000 population (age over 20 year old) for Thailand[2]. The other study was concerning the risk factors of stroke in urban community[3]. There is still no data of the epidemiology of stroke in the Thai elderly. Thus it is vital to conduct a study to address the prevalence and risk factors of stroke in this high risk group (elderly) to facilitate proper planning to combat the problem of stroke in Thailand.

PATIENTS AND METHOD

This stroke epidemiological study was conducted from August 1994 to October 1996. In order to cover four regions of Thailand, the selected study areas were :

1. Central Region	-	Nakhon Pathom Province (Amphoe Nakhon Chaisi)
2. Northern Region	-	Lampang Province (Amphoe Hang Chat)
3. North-Eastern Region	-	Sakon Nakhon Province (Amphoe Muang)
4. Southern Region	-	Ranong Province (Amphoe Muang)

In each study area Thai elderly (age over 60 years old) were enrolled in this epidemiological survey. Each subject received a complete physical and neurological examination from a neurologist. Demographic data concerning each subject was collected by specially trained nurses. Data included age, sex, occupation, education, drug usage, alcohol, smoking and underlying diseases. Blood was taken from each subject for complete blood count, fasting blood sugar, cholesterol, triglyceride, high density lipoprotein cholesterol and VDRL.

Data from physical examinations were recorded with particular attention to blood pressure, carotid bruit, cardiac murmur, cardiac arrhythmia, speech, posture, gait, frontal lobe releasing signs, Babinski sign and focal neurological deficit. History of hypertension, previous heart disease, alcohol and smoking were rechecked by neurologists during the physical examination. Descriptive analysis using SPSS 6.0 is used in this cross-sectional survey to draw comparisons between groups.

RESULT

The total of 3,036 Thai elderly were included in this study; 615 subjects from Nakhon Pathom, 840 from Lampang, 706 from Sakon Nakhon, and 857 from Ranong. The total number of stroke patients among 3,036 examined subjects was 34, thus prevalence rate was calculated as 1.12 per cent. The distribution of stroke patients in

each region was as follows : Nakhon Pathom (12/615 = 1.99%), Lampang (5/840=0.6%), Sakon Nakhon (4/706 = 0.6%), and Ranong (13/857 = 1.5%).

Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly were tabulated in detail nation-wide and for each region (Table 1-5).

DISCUSSION

Epidemiological studies of stroke have been done world-wide to estimate the magnitude and burden of the disease[4]. Epidemiology of stroke in developed countries is well established as in North America, Europe and Australia. These data include prevalence, incidence, mortality, and sacular trend in stroke. The developing world has fewer documented statistics concerning stroke. For example, Asian countries (comprising more than half of the world population) have very limited information on incidence, prevalence and mortality due to stroke. Kurtzke has estimated that among Caucasians, the mortality rate due to stroke is 50 to 100 per 100,000; the incidence rate is 100 to 200 per 100,000; and the prevalence rate is 500 to 600 per 100,000[5]. Viriyavejakul reviewed epidemiological studies of stroke in Asia and reported lower stroke mortality rate, probably due to inaccuracy of death certificates in rural areas[6].

Table 1. Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly nation-wide.

	Stroke (n=34)	Non-strok (n=3036)	P-value
1. Age (mean ± SD)	69.06 ± 6.54	68.98 ± 6.80	0.95
2. Sex : M : F	20 : 14	1089 : 1738	0.006
3. Body weight (kgs)	54.93 ± 10.01	53.67 ± 11.0	0.532
4. Height (cm)	154.41 ± 8.12	153.27 ± 29.56	0.837
5. Systolic blood pressure	151.0 ± 26.83	134.28 ± 31.39	0.004
6. Diastolic blood pressure	95.0 ± 15.26	83.25 ± 14.29	< 0.0001
7. BP ≥ 140/90	66.7 %	34.2 %	0.001
8. BP ≥ 160/90	46.7 %	16.3 %	0.00001
9. Hematocrit (%)	42.52 ± 5.08	40.39 ± 6.14	0.098
10. Mean arterial blood pressure	113.66 ± 18.16	100.26 ± 17.63	< 0.0001
11. History of hypertension (%)	43.3	58.4	0.859
12. History of heart disease (%)	6.7	6.3	0.926
13. Smoker (%)	55.6	51.9	0.661
14. Ex-smoker (%)	44.4	48.1	0.661
15. Alcohol abuse (%)	47.2	44.4	0.735
16. Ex-alcohol abuse (%)	52.8	55.6	0.735
17. Displaced cardiac apex (%)	17.6	7.4	0.039
18. Carotid bruit (%)	0	1.6	1.000
19. Cardiac murmurs (%)	2.9	5.2	1.000
20. AF or irregular pulse (%)	0	1.2	1.000
21. Dysarthria (%)	17.6	0.4	< 0.0001
22. Frontal lobe releasing signs (%)			
Palmomental	47	25.7	0.008
Grasping	5.8	2.45	0.20
Snouting	49.9	47.2	0.87
Glabellar	17.6	25.2	0.42
23. Babinski's sign (%)	23.5	2.1	< 0.0001
24. Abnormal posture (%)	20.6	8.4	0.021
25. Abnormal gait (%)			
Spastic	0	0.7	1.000
Hemiplegic	47.1	0.2	< 0.0001
Shuffling/festinant	2.9	0.3	0.105
26. FBS	117.89 ± 58.09	102.94 ± 39.21	0.185
27. Cholesterol	249.37 ± 47.20	232.63 ± 53.30	0.105
28. Triglycerides	208.81 ± 103.24	182.95 ± 115.53	0.247
29. HDL	34.59 ± 8.65	39.88 ± 14.70	0.062
30. VDRL+ve (%)	0	2.4	1.0

Table 2. Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly in Nakhon Pathom Province

	Stroke (n=12)	Non-stroke (n=615)	P-value
1. Age (mean ± SD)	68.42 ± 6.67	69.88 ± 7.31	0.535
2. Sex : M : F	7 : 5	214 : 389	0.13
3. Body weight (kgs)	58.32 ± 9.75	53.60 ± 10.71	0.1159
4. Height (cm)	153.49 ± 7.71	152.08 ± 8.62	0.6167
5. Systolic blood pressure	153.33 ± 32	141.38 ± 23.57	0.1466
6. Diastolic blood pressure	99.17 ± 19.29	88.19 ± 17.11	0.0257
7. BP ≥ 140/90	66.7%	46.5%	0.272
8. BP ≥ 160/90	50.0%	24.8%	0.084
9. Hematocrit (%)	41.09 ± 2.14	38.97 ± 4.50	0.5314
10. Mean arterial blood pressure	117.22 ± 22.42	105.92 ± 17.93	0.032
11. History of hypertension (%)	50	16.6	0.008
12. History of heart disease (%)	8.3	6.7	0.566
13. Smoker (%)	25	24.05	1.0
14. Ex-smoker (%)	16.67	9.95	0.345
15. Alcohol abuse (%)	8.33	16.75	0.701
16. Ex-alcohol abuse (%)	8.33	11.11	1.0
17. Displaced cardiac apex (%)	23.1	10.5	0.128
18. Carotid bruit (%)	0	1.5	1.0
19. Cardiac murmurs (%)	0	7.1	1.0
20. AF or irregular pulse (%)	0	1.6	1.0
21. Dysarthria (%)	23.1	0.1	0.00002
22. Frontal lobe releasing signs (%)			
Palmomental	46.2	30.4	0.202
Grasping	7.7	2.3	0.258
Snouting	38.5	35.7	0.763
Glabellar	18.2	7.7	0.763
23. Babinski's sign (%)	15.4	2	0.027
24. Abnormal posture (%)	23.1	9.8	0.111
25. Abnormal gait (%)			
Spastic	0	0.1	1.0
Hemiplegic	38.5	0	0.0000001
Shuffling/festinant	7.7	3.8	0.077
26. FBS	152.82 ± 79.92	119.36 ± 46.57	0.196
27. Cholesterol	274.27 ± 40.22	262.11 ± 43.13	0.340
28. Triglycerides	220.64 ± 77.59	179.16 ± 117.79	0.246
29. HDL	36.26 ± 5.84	41.75 ± 11.29	0.088
30. VDRL+ve (%)	0	2	1.0

The most important considerations in epidemiological investigations are the accuracy of the diagnosis and the representativeness of the population surveyed. Diagnostic accuracy is a direct function of the neurological expertise available to evaluate the population. Overcoming this weakness, this study was done by neurologists and each individual subject was examined fully with both physical and neurological examinations. Concerning the population surveyed, the representative areas of each region were selected to produce nation-wide data. All elderly aged over 60 years old in the selected areas were enrolled in this study. Whenever a stroke patient was indentified, another neurologist was asked to reconfirm the accuracy of physical findings. Thus this study is aiming to verity the accuracy of the definite diagnosis of stroke and risk factors.

Stroke prevalence increases with age. Thus elderly is the highest risk group for stroke attack. Data from United States of America showed 1-5 per cent prevalence rate of stroke after the age of 65 years old[4,5,7,8]. The prevalence rate of stroke in elderly (age over 60) in this community-based study was 1.12 per cent which it is the only data available in Thailand that could be coded for comparison in the future.

Table 3. Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly in Lampang Province

	Stroke (n=5)	Non-stroke (n=840)	P-value
1. Age (mean ± SD)	72.80 ± 9.68	69.42 ± 7.12	0.292
2. Sex : M : F	2 : 3	332 : 459	0.866
3. Body weight (kgs)	34.54 ± 21.58	46.46 ± 10.09	0.284
4. Height (cm)	153.00 ± 10.00	149.80 ± 10.69	0.551
5. Systolic blood pressure	138.00 ± 22.80	125.95 ± 43.09	0.533
6. Diastolic blood pressure	88.00 ± 8.36	77.13 ± 11.76	0.04
7. BP ≥ 140/90	40%	16.7%	0.199
8. BP ≥ 160/90	20%	6.1%	0.276
9. Hematocrit (%)	-	-	-
10. Mean arterial blood pressure	104.66 ± 11.92	93.40 ± 18.44	0.174
11. History of hypertension (%)	50.0	18.1	0.335
12. History of heart disease (%)	-	2.9	-
13. Smoker (%)	100	62.1	1.00
14. Ex-smoker (%)	0	42.7	NA
15. Alcohol abuse (%)	100	33.7	NA
16. Ex-alcohol abuse (%)	100	20.5	NA
17. Displaced cardiac apex (%)	25	8.7	0.309
18. Carotid bruit (%)	0	1.8	1.000
19. Cardiac murmurs (%)	0	5.4	1.000
20. AF or irregular pulse (%)	0	0.9	1.000
21. Dysarthria (%)	5	0.6	0.029
22. Frontal lobe releasing signs (%)			
Palmomental	100.0	29.6	0.325
Grasping	0	2.7	1.000
Snouting	75	61.3	0.645
Glabellar	50	35.6	0.619
23. Babinski's sign (%)	100	0.2	< 0.001
24. Abnormal posture (%)	50	13.2	0.088
25. Abnormal gait (%)			
Spastic	0	0.8	1.000
Hemiplegic	75	0.3	< 0.001
Shuffling/festinant	-	-	-
26. FBS	92.33 ± 10.97	90.60 ± 19.54	0.030
27. Cholesterol	267 ± 65.20	191.98 ± 40.76	0.002
28. Triglycerides	353.66 ± 107.67	198.26 ± 111.95	0.017
29. HDL	36.00 ± 5.56	43.21 ± 10.34	0.228
30. VDRL+ve (%)	-	-	-

Data on risk factors of stroke in the developing world are usually similar to those from developed countries because most of the data are collected in the same format of standard design. Age and hypertension are the most important risk factors for stroke. Other factors such as diabetes mellitus, smoking, elevated blood lipids and obesity seem to be of less importance in stroke than in heart disease. In Thailand there are only a few studies concerning stroke risk factors, and all these were studies involving only small numbers of patients and thus did not represent the whole nation(9-11).

Data from this study revealed that the most important risk factor of stroke in Thai elderly was hypertension. The prevalence of hypertension among Thai elderly in this study varied between 16.7 to 47.2 per cent (criteria over 140/90 mmHg) or 6.1 to 24.8 per cent (criteria over 160/90 mmHg). The lowest prevalence of hypertension was recorded from the Northern region, probably because the study area is less urbanized than other regions. This confirms the notion that hypertension is a disease resulting from urbanization. Diabetes mellitus, underlying heart disease, hyperlipidemia, smoking and alcohol consumption seemed to be

Table 4. Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly in in Sakon Nakhon Province

	Stroke (n=4)	Non-stroke(n=706)	P-value
1. Age (mean ± SD)	71.00 ± 7.61	68.40 ± 6.29	0.412
2. Sex : M : F 3 : 1	237 : 416	0.382	
3. Body weight (kgs)	54.75 ± 11.87	55.66 ± 13.19	0.890
4. Height (cm)	149.00 ± 2.64	152.29 ± 7.82	0.466
5. Systolic blood pressure	135.00 ± 19.14	138.09 ± 22.81	0.787
6. Diastolic blood pressure	92.50 ± 12.58	88.0646 ± 13.32	0.507
7. BP ≥ 140/90	50.0%	47.2%	1.000
8. BP ≥ 160/90	25%	20.5%	1.000
9. Haematocrit (%)	38.66 ± 2.88	38.11 ± 7.02	0.892
10. Mean arterial blood pressure	106.66 ± 14.40	104.75 ± 15.76	0.809
11. History of hypertension (%)	0	15.0	1.00
12. History of heart disease (%)	0	9.3	1.00
13. Smoker (%)	-	19.5	NA
14. Ex-smoker (%)	100	12.6	NA
15. Alcohol abuse (%)	-	18.1	NA
16. Ex-alcohol abuse (%)	7.3	100	NA
17. Displaced cardiac apex (%)	0	2.4	1.00
18. Carotid bruit (%)	0	1.3	1.00
19. Cardiac murmurs (%)	0	3.1	1.00
20. AF or irregular pulse (%)	0	0.8	1.00
21. Dysarthria (%)	25	0.6	0.028
22. Frontal lobe releasing signs (%)			
Palmomental	0	16.4	1.000
Grasping	0	2.9	1.000
Snouting	75	49.9	0.623
Glabellar	50	40.1	1.000
23. Babinski's sign (%)	0	4.7	1.000
24. Abnormal posture (%)	0	2.8	1.00
25. Abnormal gait (%)			
Spastic	0	1.0	1.00
Hemiplegic	25	0.3	1.00
Shuffling/festinant	-	-	-
26. FBS	87.66 ± 0.57	110.98 ± 46.39	0.385
27. Cholesterol	282.50 ± 49.95	246.94 ± 54.53	0.358
28. Triglycerides	134.00 ± 50.91	184.80 ± 102.29	0.483
29 HDL	53.60 ± 11.87	51.19 ± 18.26	0.852
30. VDRL+ve (%)	0	4.5	1.00

insignificant risk factors of stroke in Thai elderly. The rate of smoking in Thai elderly is very high, ranging from 19.5 per cent (Sakon Nakhon) to 62.1 per cent (Lampang). Alcohol abuse is still prevalent in the Thai elderly, ranging from 16.75 per cent (Nakhon Pathom) to 33.70 per cent (Lampang).

Data from physical examination revealed that dysarthria, hemiplegic gait and Babinski sign were the significant signs for diagnosis of stroke patients in the community setting. Carotid bruit, cardiac murmur and cardiac arrthythmia (especially atrial fibrillation) are important signs for determining source of stroke, but this study revealed no difference in the prevalence of these signs between stroke patients and non-stroke subjects. The prevalence of carotid bruit in Thai elderly was varying between 1.3 to 1.8 per cent whereas cardiac murmur and cardiac arrhythmia were varying between 3.1 to 7.1 per cent and 0.8 to 1.4 per cent respectively. It is not doubted that patients with carotid bruit, cardiac murmur and cardiac arrhythmia are prone to have stroke attack. Thus this high risk elderly group needs to be screened for and have proper management of these factors so that stroke can be prevented. Frontal lobe releasing signs are

Table 5. Comparison of demographic data, clinical parameters and blood tests of stroke patients and non-stroke elderly in Ranong Province.

	Stroke (n=13)	Non-stroke (n=857)	P-value
1. Age (mean ± SD)	67.61 ± 4.62	68.30 ± 6.22	0.691
2. Sex : M : F	8 : 5	316 : 496	0.18
3. Body weight (kgs)	55.67 ± 10.61	49.08 ± 18.97	0.212
4. Height (cm)	157.25 ± 8.54	154.93 ± 46.34	0.862
5. Systolic blood pressure	160.90 ± 25.86	136.23 ± 23.51	0.001
6. Diastolic blood pressure	100.90 ± 32.07	84.00 ± 12.76	0.111
7. BP ≥ 140/90	75%	38.2%	0.014
8. BP ≥ 160/90	50%	17.4%	0.0107
9. Haematocrit (%)	44.74 ± 6.30	43.04 ± 5.40	0.303
10. Mean arterial blood pressure	112.77 ± 15.75	100.93 ± 14.60	0.006
11. History of hypertension (%)	50	23.1	0.039
12. History of heart disease (%)	0	7.8	0.614
13. Smoker (%)	63.7 %	45.6 %	NA
14. Ex-smoker (%)	20 %	26.7 %	NA
15. Alcohol abuse (%)	58.2 %	27.8 %	NA
16. Ex-alcohol abuse (%)	37.5 %	17.9 %	NA
17. Displaced cardiac apex (%)	7.7	15.4	0.272
18. Carotid bruit (%)	0	1.6	1.00
19. Cardiac murmurs (%)	7.7	5.2	0.502
20. AF or irregular pulse (%)	0	1.4	1.00
21. Dysarthria (%)	7.7	0.2	0.046
22. Frontal lobe releasing signs (%)			
Palmomental	46.2	25.8	0.112
Grasping	7.7	1.8	2.225
Snouting	46.2	41.5	0.995
Glabellar	7.7	8.5	1.000
23. Babinski's sign (%)	2.5	1.62	0.001
24. Abnormal posture (%)	15.4	8.23	0.265
25. Abnormal gait (%)			
Spastic	0	0.7	1.000
Hemiplegic	53.8	0.4	< 0.001
Shuffling/festinant	0.4	0	1.000
26. FBS	98.18 ± 20.84	92.94 ± 30.86	0.575
27. Cholesterol	213.63 ± 30.37	227.68 ± 48.59	0.339
28. Triglycerides	171.09 ± 99.90	174.23 ± 123.51	0.933
29. HDL	29.09 ± 5.57	28.28 ± 7.00	0.705
30. VDRL+ve (%)	0	1.2	1.00

significant findings in the Thai elderly in this study but they are not relevant to stroke attack. Hematocrit and blood test for VDRL are usually routine investigations for stroke patients, but this study showed no significant difference between stroke and non-stroke subjects in these two tests.

This epidemiological study in Thai elderly revealed high prevalence of stroke in the community (1.12 per cent). In Thailand, there are around 7 per cent of the population aged over 60 years (4.3 million), which are a high risk group to develop stroke. The burden of stroke on patients, their families and society is generally emphasised and correctly publicised in most developed countries[12]. It is thus appropriate to set stroke as a priority and to initiate a program of stroke prevention in Thailand in order to combat stroke countrywide.

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ระบาดวิทยาของโรคหลอดเลือดสมองในผู้สูงอายุในประเทศไทย

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คณะผู้วิจัยได้ทำการศึกษาระบาดวิทยาของโรคหลอดเลือดสมองในผู้สูงอายุชาวไทย (อายุเกิน 60 ปี) ทั้งหมด จำนวน 3,036 คน ในระหว่างเดือน สิงหาคม 2537 – ตุลาคม 2539 การศึกษาครั้งนี้กระทำโดยการสำรวจใน 4 ภาค คือ ภาคกลางศึกษาที่อำเภอนครชัยศรี จังหวัดนครปฐม สำรวจผู้สูงอายุ 615 คน, ภาคเหนือศึกษาที่อำเภอห้างฉัตร จังหวัดลำปาง สำรวจผู้สูงอายุจำนวน 840 คน, ภาคตะวันออกเฉียงเหนือศึกษาที่อำเภอเมือง จังหวัดสกลนคร สำรวจผู้สูงอายุจำนวน 706 คน และภาคใต้ศึกษาที่อำเภอเมือง จังหวัดระนอง สำรวจผู้สูงอายุจำนวน 857 คน. ผู้สูงอายุทุกคนในเขตพื้นที่สำรวจจะได้รับการตรวจร่างกายทั่วไปโดยละเอียด และได้รับการตรวจร่างกายระบบประสาทโดยประสาทแพทย์. การซักประวัติด้านอายุ, เพศ, อาชีพ, การศึกษา, ยาที่ใช้ประจำ, การดื่มเหล้า, สูบบุหรี่และโรคประจำตัว, กระทำโดยพยาบาลที่ได้รับการฝึกอบรมมาแล้วอย่างดี. ผู้สูงอายุทุกคนจะได้รับการเจาะเลือดตรวจนับเม็ดเลือดทุกชนิด, หาระดับน้ำตาล, ไขมันทุกชนิดและการทดสอบ วีดีอาร์แอล. สำหรับการตรวจร่างกายผู้สูงอายุเน้นข้อมูลต่าง ๆ เหล่านี้เป็นพิเศษ ได้แก่ ความดันเลือด, เสียงผิดปรกติที่หลอดเลือดแดงบริเวณคอ, เสียงหัวใจผิดปรกติ, การเต้นหัวใจที่ผิดปรกติ, การพูด, ท่ายืน, ท่าเดิน, frontal lobe releasing signs, อาการแสดง Babinski และความผิดปรกติเฉพาะที่ของระบบประสาท

ผลการศึกษาพบว่าตรวจพบผู้ป่วยเป็นโรคหลอดเลือดสมอง 34 คน จากผู้สูงอายุทั้งหมด 3,036 คน, คิดเป็นอัตราความชุก ร้อยละ 1.12 โดยแบ่งเป็นภาคต่าง ๆ ดังนี้, ภาคกลางพบ 12 คนใน 615 คน (ร้อยละ 1.99), ภาคเหนือพบ 5 คน ใน 840 คน (ร้อยละ 0.6), ภาคตะวันออกเฉียงเหนือพบ 4 คน ใน 706 คน (ร้อยละ 0.6) และภาคใต้พบ 13 ใน 857 คน (ร้อยละ 1.5). การศึกษาเรื่องปัจจัยเสี่ยงพบว่ามีเพียงภาวะความดันเลือดสูงที่เป็นปัจจัยเสี่ยงที่สำคัญในการเกิดโรคหลอดเลือดสมอง. ส่วนโรคเบาหวาน, การสูบบุหรี่, โรคหัวใจที่มีอยู่, การดื่มสุรา, และภาวะไขมันในเลือดสูงพบว่าเป็นปัจจัยเสี่ยงที่ไม่มีนัยสำคัญทางสถิติ. สำหรับอุบัติการของภาวะความดันเลือดสูงในผู้สูงอายุไทยพบว่ามีค่าสูงระหว่างร้อยละ 16.7–47.2 (ถ้าใช้เกณฑ์สูงกว่า 140/90 มม.ปรอท) หรือร้อยละ 6.1–24.8 (ถ้าใช้เกณฑ์สูงกว่า 160/90 มม.ปรอท). การสูบบุหรี่และดื่มสุราพบว่าในผู้สูงอายุมีอัตราความชุกระหว่างร้อยละ 19.5 (จังหวัดสกลนคร) ถึง 62.1 (จังหวัดลำปาง) และร้อยละ 16.75 (จังหวัดนครปฐม) ถึง 33.70 (จังหวัดลำปาง) ตามลำดับ.

ข้อมูลการตรวจร่างกายพบว่าอาการพูดไม่ชัด, ท่าเดินผิดปรกติแบบอัมพาตครึ่งซีกและอาการแสดง Babinski เป็นสิ่งที่ช่วยในการวินิจฉัยโรคหลอดเลือดสมองได้ดีสำหรับการศึกษาผู้ป่วยในชุมชน. อนึ่งความชุกของภาวะเสียงผิดปรกติที่หลอดเลือดแดงบริเวณคอ, เสียงหัวใจผิดปรกติและการเต้นของหัวใจผิดปรกติพบได้ในผู้สูงอายุในอัตราร้อยละ 1.3–1.8, 3.1–7.1 และ 0.8–1.4 ตามลำดับ.

การศึกษาครั้งนี้สรุปว่าการป้องกันการเกิดโรคหลอดเลือดสมองในผู้สูงอายุไทยเป็นสิ่งสำคัญและได้ผลดีกว่าการรักษา. วิธีการป้องกันโรคหลอดเลือดสมองต้องดำเนินการโดยการตรวจร่างกายของผู้สูงอายุเพื่อค้นหาปัจจัยเสี่ยงโรคและดำเนินการแก้ไขปัจจัยเหล่านั้นอย่างถูกต้องและเหมาะสม

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