

Patients were admitted due to ischemic stroke between 2001 to 2013
(*n* = 471,048)

- < 40 years old: 9,849
- Carotid disease: 780
Aneurysm in cerebral arteries or cerebral arteriovenous fistula: 4,024
Stenosis over cerebrovascular disease: 7,758
- AF/AFL was diagnosed before ischemic stroke: 36,536
AF/AFL was diagnosed at index ischemic stroke: 18,294
- Patients have below diseases during observation period
 - 1.VHD surgery: 1,055
 - 2.RHD: 4,546
 - 3.Hyperthyroidism: 9,376
 - 4.Anticoagulation before event of ischemic stroke: 8,956
- Death during the index admission: 9,878

Eligible ischemic stroke patients
(*n* = 359,996)

DM
(*n* = 98,103)

Non-DM
(*n* = 261,893)

AF
(*n* = 4,976)

Non-AF
(*n* = 93,127)

AF
(*n* = 16,127)

Non-AF
(*n* = 245,766)

eTable 1. Diagnoses Used to Define the Cohorts, Comorbidities, and Outcomes

Disease	Criteria of Diagnosis	
Ischemic stroke and atrial fibrillation		
Ischemic stroke	Defined from principal diagnosis of index hospitalization	ICD9-CM: 433-435
Atrial fibrillation	Defined from diagnosis	ICD9-CM: 42731
Excluding Diseases		
Carotid disease	Defined from diagnosis or carotid stenting or endarterectomy	ICD9-CM: 433.1
Aneurysm and fistula in cerebral arteries and Stenosis over cerebrovascular disease		ICD9-CM: 437.3, 747.81, 447.0 ICD9-CM: 433.0, 433.2, 433.3, 433.8, 433.9, 434.90
Hyperthyroidism	Defined from diagnosis plus treatment	ICD9-CM: 242* and any anti-thyroid drugs
Rheumatic heart disease	Defined from diagnosis	ICD9-CM: 394.0, 394.1, 394.2, 395*, 398.9*
Comorbidities		
Hypertension	Defined from diagnosis plus treatment	401*, 402*, 403*, 404*, 405* and any anti-hypertension drugs
Diabetes mellitus	Defined from diagnosis plus treatment with any oral hypoglycemic drugs and insulin	250
Ischemic heart disease	Defined from diagnosis	410~414
Heart failure	Defined from diagnosis	42
Dyslipidemia	Defined from diagnosis	272
Gout	Defined from diagnosis	274
Chronic obstructive pulmonary disease	Defined from diagnosis	491, 492, 496
Peripheral arterial disease	Defined from diagnosis	440.0, 440.2, 440.3, 440.8, 440.9, 443, 444.0, 444.22, 444.8, 447.8, and 447.9
Chronic kidney disease	Defined from diagnosis	580~589, 403~404 016.0, 095.4, 236.9 250.4, 274.1, 442.1, , 447.3, ,440.1, 572.4, 642.1, 646.2 753.1 283.11, 403.01,and 404.02, 446.21
Dialysis	Defined from diagnosis in catastrophic registry data	585

Abnormal liver function	Defined from diagnosis	070, 456.0–456.2, 570, 571, 572.2–572.8, 573, V42.7
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History of Events

Ischemic stroke	Defined from diagnosis in hospitalization	433~437
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Medication*	ATC code
Angiotensin converting enzyme inhibitors/angiotensin II receptor blockers	C09
β-blockers	C07
Calcium channel blockers	C08
Statins	C10AA

*The usage of these medications was defined as being prescribed with the medication for at least 3 months.

ATC: Anatomical Therapeutic Chemical

eTable 2. Baseline clinical characteristics of the study patients

Characteristics	DM (N = 98,103)		P value	Non-DM (N = 261,893)		P value
	Non-AF (n = 93,127)	AF (n = 4,976)		Non-AF (n = 245,766)	AF (n = 16,127)	
Age (years)	68.6±10.2	72.3±9.1	<.001	68.4±12.3	74.8±10.2	<.001
Age group			<.001			<.001
< 55	10,167 (10.9)	223 (4.5)		41,739 (17.0)	790 (4.9)	
55-64	22,872 (24.6)	793 (15.9)		52,001 (21.2)	1,826 (11.3)	
65-74	33,082 (35.5)	1,862 (37.4)		68,626 (27.9)	4,733 (29.4)	
≥ 75	27,006 (29.0)	2,098 (42.2)		83,400 (33.9)	8,778 (54.4)	
Gender			<.001			<.001
Male	49,070 (52.7)	2,411 (48.5)		152,437 (62.0)	9,256 (57.4)	
Female	44,057 (47.3)	2,565 (51.5)		93,329 (38.0)	6,871 (42.6)	
Comorbidity						
Previous myocardial infarction	3,576 (3.8)	271 (5.4)	<.001	5,293 (2.2)	515 (3.2)	<.001
Coronary artery disease	22,954 (24.6)	1,755 (35.3)	<.001	42,872 (17.4)	4,640 (28.8)	<.001
Chronic kidney disease	7,546 (8.1)	429 (8.6)	.192	8,436 (3.4)	622 (3.9)	.004
Dialysis	2,269 (2.4)	117 (2.4)	.704	2,654 (1.1)	170 (1.1)	.759
Chronic obstructive pulmonary disease	8,115 (8.7)	567 (11.4)	<.001	25,255 (10.3)	2,508 (15.6)	<.001
Gout	8,039 (8.6)	492 (9.9)	.002	23,924 (9.7)	2,013 (12.5)	<.001
Peripheral arterial disease	4,198 (4.5)	250 (5.0)	.088	6,431 (2.6)	524 (3.2)	<.001
Hypertension	82,875 (89.0)	4,609 (92.6)	<.001	181,837 (74.0)	12,682 (78.6)	<.001
Heart failure	5,602 (6.0)	504 (10.1)	<.001	8,012 (3.3)	1,072 (6.6)	<.001
Dyslipidemia	48,663 (52.3)	2,297 (46.2)	<.001	76,355 (31.1)	3,607 (22.4)	<.001
Abnormal liver function	11,060 (11.9)	501 (10.1)	<.001	22,266 (9.1)	1,363 (8.5)	.009
Old stroke	12,063 (13.0)	755 (15.2)	<.001	22,576 (9.2)	1,811 (11.2)	<.001
Medications						
ACEI/ARB	54,146 (58.1)	3,014 (60.6)	.001	104,071 (42.3)	7,002 (43.4)	.008
CCB	43,973 (47.2)	2,534 (50.9)	<.001	100,879 (41.0)	6,760 (41.9)	.030
β-blocker	25,732 (27.6)	1,689 (33.9)	<.001	55,746 (22.7)	4,527 (28.1)	<.001
Statin	29,801 (32.0)	1,354 (27.2)	<.001	59,236 (24.1)	2,613 (16.2)	<.001

Abbreviations: AF: atrial fibrillation; DM: diabetes mellitus; ACEI/ARB: angiotensin converting enzyme inhibitors/ angiotensin II receptor blockers; CCB: calcium channel blocker.

