Online supplementary materials

Five-year recurrence rate and the predictors following stroke in the Mashhad Stroke Incidence Study: A population-based cohort study of stroke in the Middle East

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Supplementary methods:

Definitions

Stroke was defined according to the World Health Organization criteria as rapidly developing signs of focal or global disturbance of cerebral function lasting >24 hours (unless interrupted by surgery or death) with no apparent cause other than a vascular origin (1).

Recurrent stroke was defined as stroke-like symptoms that occurred at least 24 hours after the index event, and were not attributable to edema, mass effect, brain shift syndrome, or hemorrhagic transformation (2, 3).

First-ever stroke (FES) is defined as a stroke occurring for the first time during a patient's lifetime

Neuroimaging was used to classify patients with definite FESs into ischemic stroke (IS), intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH) subgroups.

Supplementary Table 1. Baseline demographic and major variable between those lost to followe-up* and those with complete 5- year follow-up

Variable	Complete follow up*** N= 555	Lost to follow up N= 69	P- Value
Age (mean±SD)	65.4 ± 14.7	57.7 ± 13.4	<0.001
Sex: female, n (%)	262 (88.2)	35 (11.8)	
Education> 12 years, n (%)	99 (81.8)	22 (18.2)	0.007
Hospitalized, n (%)	357 (90.2)	39 (9.8)	
Current smoker n (%)	62 (87.3)	9 (12.7)	
Current alcohol drinker n (%)	17 (94.4)	1 (5.6)	
Diabetes mellitus n (%)	168 (89.8)	19 (10.2)	
Hypertension n (%)	340 (91.2)	33 (60.2)	0.03
Atrial fibrillation n (%)	47 (90.4)	5 (9.6)	
Hyperlipidemia n (%)	133 (89.9)	15 (10.1)	
TIA** n (%)	43 (87.8)	6 (12.2)	
NIHSS*** at admission (mean±SD)	11.3 ± 6.5	6.8 ± 10.5	<0.001

* 3 patients immediately after their discharge from our hospitals, 5 patients during the first year and 61 patients after one year due to change of address or loss of contact **transient Ischemic attack (TIA) before the index stroke; *** National Institute of Health Stroke Scale

Supplementary Table 2. Competing risk analysis of the cumulative incidence of the first recurrent stroke within defined time intervals after the first ever stroke by index stroke subtypes.

Time	Ischemic stroke		Hemorrhagic stroke		Undefined stroke		Total	
	Recurrence N	Cumulative Recurrence N (risk %)	Recurrence N	Cumulative Recurrence N (risk %)	Recurrence N	Cumulative Recurrence N (risk %)	Recurrence N	Cumulative Recurrence N (risk %)
30 days	7	7 (1.9)	0	0 (0.4)	0	0 (0.9)	7	7 (1.1)
1-12 months	25	32 (4.8)	2	2 (6.3)	1	1 (5.8)	28	35 (5.6)
1-2 years	20	52 (10.4)	0	2 (12.1)	2	3 (7.02)	22	57 (9.8)
2-3 years	11	63 (15.03)	2	4 (13.9)	0	3 (8.1)	13	70 (12.3)
3-4 years	4	67 (15.6)	0	4 (13.9)	0	3 (9.9)	4	74 (13.1)
4-5 years	6	73 (17.9)	1	5 (15.1)	0	3 (10.5)	7	81 (14.5)

Supplementary Table 3. Univariable analysis of risk factors for recurrent stroke at 5 years after first ever stroke using Cox proportional hazards regression.

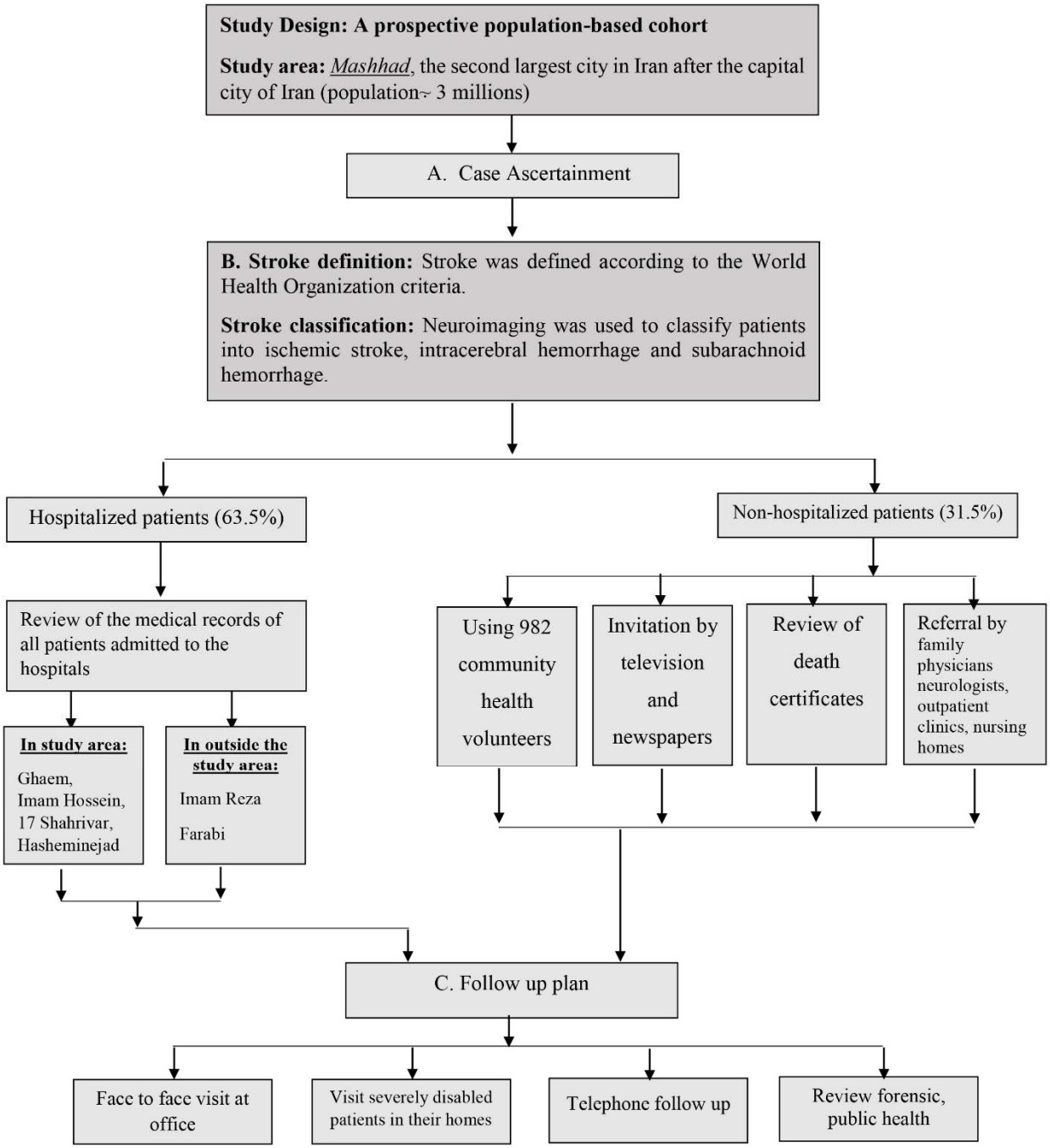
Variable	Five-year recurrence		Univariable
	Yes (n= 81) N (%)	No (n= 543) N (%)	Hazard ratio (95% CI)
Male	44 (54.3)	282 (51.9)	1.12 (0.72−1.73)
Age (mean±SD)	66.16±13.77	64.29±14.96	1.02 (1.005−1.03)
High school diploma and more	13 (16.0)	108 (19.9)	0.6 (0.3-1.08)
Family history of stroke	14 (17.3)	97 (17.9)	1.1 (0.62−1.97)
History of TIA before index stroke	5 (6.2)	44 (8.1)	0.96 (0.39−2.39)
Index stroke			
Hemorrhagic stroke	5 (6.2)	89 (16.4)	0.45 (0.18-1.11)
Ischemic stroke	73 (90.1)	439 (80.8)	1.66 (0.8-3.44)
Undefined stroke	3 (3.7)	15 (2.8)	1.4 (0.44-4.4)
NIHSS at admission			
No or mild symptoms (0-4)	36 (44.4)	238 (43.8)	0.57 (0.37-0.89)
Moderate (5-15)	31(38.3)	150 (27.6)	1.27 (0.81-1.99)
Moderate to severe (16-20)	6 (7.4)	40 (7.4)	2.01 (0.87-4.64)
Severe (21-42)	8 (9.9)	115 (21.2)	1.97 (0.94-4.13)
Current smoker	11 (13.6)	85 (15.6)	0.73 (0.38−1.38)
Current alcohol drinker	1 (1.2)	17 (3.1)	0.3 (0.04−2.2)
Diabetes mellitus	24 (29.6)	160 (29.4)	0.91 (0.56−1.47)
Hypertension	50 (61.7)	321 (59.1)	1.18 (0.76−1.86)
Atrial fibrillation	8 (9.9)	44 (8.1)	2.1 (1.01-4.37)
Hyperlipidemia	13 (16.04)	135 (24.9)	0.52 (0.29−0.95)
Persian ethnicity	67 (82.7)	451 (83.05)	0.9 (0.5−1.65)
Income			
Low annual income (less than 2580 US dollars)	50 (61.7)	286 (52.7)	1.42 (0.64−3.14)
Middle annual income (2580 to 5160 US dollars)	24 (29.6)	214 (39.4)	0.77 (0.33−1.79)
High annual income (more than 5160 US dollars)	7 (8.6)	43 (7.9)	0.89 (0.41-1.94)
Employment status			
Employed	28 (34.6)	164 (30.2)	1.02 (0.64-1.62)
Retired	9 (11.1)	81 (14.9)	0.72 (0.34−1.53)
Disabled	1 (1.2)	8 (1.5)	1.10 (0.15−8.11)
Unemployed	43 (53.1)	279 (51.4)	1.03 (0.64−1.66)

Abbreviations: NIHSS: National Institutes of Health Stroke Scale

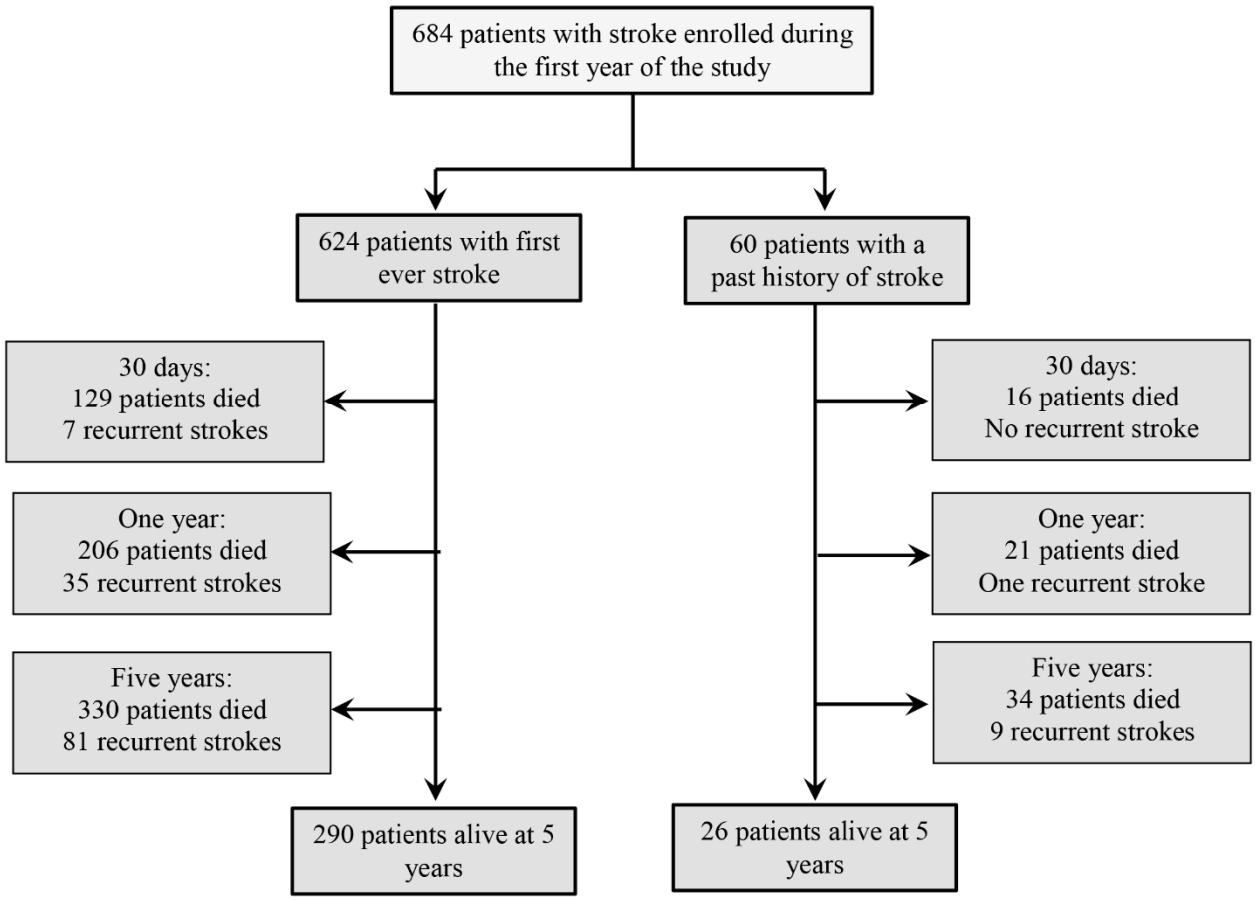
Supplementary Table 4. The frequency of vascular risk factors and their treatment in patients with and without stroke recurrence

Variables	Without recurrence	With recurrence	Total	
Hypertension, n (%)	321 (59.9)	50 (61.7)	373 (60.2)	0.75
Antihypertensive medications before the index stroke, n (%)	251 (78.2)	35 (70.0)	286 (77.1)	0.2
Hyperlipidemia, n (%)	135 (25.4)	13 (16)	148 (24)	0.06
Lipid lowering medications before the index stroke, n (%)	11 (8.1)	1 (7.7)	12 (8.1)	0.95
Diabetes mellitus, n (%)	160 (29.8)	24 (29.6)	187 (30.1)	0.97
Antidiabetic medications before the index stroke, n (%)	43 (26.9)	5 (20.8)	48 (26.1)	0.53

Supplementary Figure 1. The method of case ascertainment in Mashhad Stroke Incidence Study.



Supplementary Figure 2. Disposition of patients in the Mashhad Stroke Incidence Study cohort, including the number of deaths, recurrences and drop-outs at 30 days, 1 year and five years.



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