Factors predicting risk of 30-day recurrence after ischemic stroke or TIA

The Bergen NORSTROKE study

AN Khanevski^{1,2,3}, HA Selvik^{1,2}, V Novotny^{1,2}, H Næss^{1,4}, N Logallo^{1,5}, CE Kvistad^{1,2}, L Thomassen^{1,2}, AT Bjerkreim^{1,2}

¹Department of Neurology, Haukeland University Hospital, Bergen; ²Department of Clinical Medicine, University of Bergen, Bergen; ³Norwegian Health Association, Oslo; ⁴Centre for Age-related Medicine, Stavanger University Hospital, Stavanger; ⁵Department of Neurosurgery, Haukeland University Hospital, Bergen, Norway;

adiv@ihelse.net

BACKGROUND & AIMS

- Incidence of recurrent stroke is highest the first 30 days after the initial ischemic stroke (IS) or TIA, but there is scarce knowledge about causes behind early recurrence. We aimed to determine etiologies behind 30-day recurrence of IS or TIA.

METHODS

- Medical records of 1874 patients in the NORSTROKE-registry, discharged alive from our stroke unit, were reviewed retrospectively. Recurrence was defined as admittance with a new IS or TIA. Stroke etiology was determined by review of medical records and imaging data. We classified etiology by the TOAST classification. Cox multiple regression was used to calculate hazard ratios (HR).

RESULTS

- 33 patients (1.76%) were readmitted within 30 days. Recurrence was caused by large-artery atherosclerosis (LAA) in 21, active malignancy in 6 and cardioembolism in 3 patients; small vessel occlusion, aneurysm and operative complication in 1 patient each.
- LAA had a HR of 13.63 for 30-day recurrence (p<0.001). Patients with active cancer a HR of 12.65 for 30-day recurrence (p<0.001).

Baseline characteristics of population				Predictors of 30-day recurrence			
Characteristics	30-day recurrence N = 33	No 30-day recurrence N = 1841	P		Hazard Ratio	95 % CI	P
Age (y) mean ±SD	74.4 ± 11.5	73.2 ± 13.6	.63	Age, year	1.002	0.97 – 1.04	0.92
Sex (male)	17 (51.5)	1019 (55.4)	.66	Female	1.680	0.76– 3.72	0.20
mRS score, median (IQR)	1 (0, 1)	2 (0, 2)	.06	mRS score	1.144	1.01 – 1.29	0.03
NIHSS score, median (IQR)	1 (0, 4.5)	2 (1, 5)	.09	Length of stay > 6 days	0.898	0.81 – 1.00	0.05
BI score, median (IQR)	100 (100, 100)	100 (70, 100)	.02	Received tPA	1.531	0.61 – 3.83	0.36
Etiology (TOAST)			<.01	Cardioembolic IS/TIA	0.797	0.20 – 3.12	0.75
Atherosclerosis	21 (63.6)	237 (12.9)		Atherosclerotic IS/TIA	13.630	5.39 – 34.46	<.01
Cardioembolism	3 (9.1)	598 (32.5)		Active cancer	12.654	4.05 – 39.56	<.01
Small vessel disease	1 (3.0)	205 (11.1)		Elevated D-dimer	1.114	1.03 – 1.20	<.01
Other determined	8 (24.2)	29 (1.6)					
Undetermined	0 (0.0)	772 (41.9)					
Comorbidities							
Peripheral artery disease	15 (45.5)	358 (19.5)	<.01				
Diabetes	6 (18.2)	275 (14.9)	.61				
Angina pectoris	3 (9.1.4)	256 (13.9)	.43				
Myocardial infarction	4 (12.1)	265 (14.4)	.71				
Hypertension	23 (69.7)	1031 (56.0)	.12				
Atrial fibrillation	7 (21.2)	537 (29.2)	.32				
Prior/current smoking	21 (67.7)	1066 (60.2)	.39				
Active cancer	7 (21.2)	35 (1.90)	<.01				

Specific etiologies for patients readmitted within 30 days			
Total (n = 33)			
Large-artery atherosclerosis (LAA) (n=21)			
Intracranial			7
Extracranial			14
Cardioembolism (CE)			3
Small vessel occlusion (SUC)			1
Other demonstrated cause (SOC)			
Malignancy			6
Aneurysm			1
Postoperative complication			1

CONCLUSIONS

- Patients with LAA, both intra- and extracranial, are at highest risk of recurrent IS or TIA.
- Active cancer was a important cause of 30-day recurrence.
- It is reasonable to screen patients with early recurrence without LAA for cancer.