

The Bern Stroke Project.

Outcome of acute ischaemic stroke in the Canton of Bern, Switzerland, in 2008.

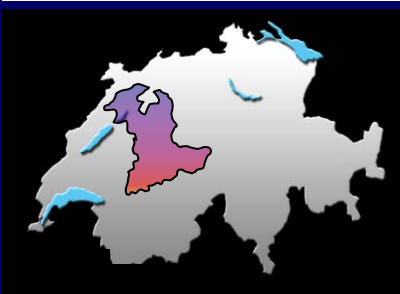
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For the QABE investigators

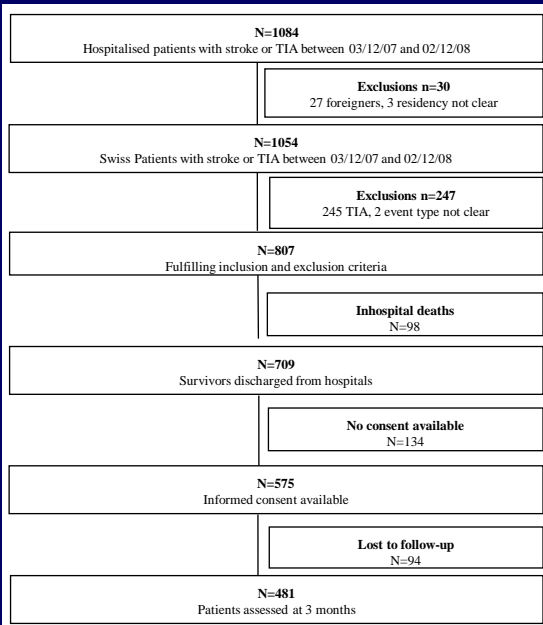
BACKGROUND: Acute stroke management has dramatically changed in the last decade: thrombolysis has been proven to be as a safe and efficacious therapy for patients with an acute ischaemic stroke (AIS) in routine clinical practice and is recommended as first-line treatment by national and international stroke associations. However, most studies in large populations analysing outcome in patients with AIS have been performed before thrombolysis has generally been adopted in daily clinical practice. Data on outcome of patients with AIS and its predictors in well defined populations in the thrombolysis area are lacking and it is not known, whether stroke outcome in the general population is influenced by the broad use of thrombolysis.

AIM: To assess short- and 3-months outcome and its' predictors of consecutive AIS patients during 12 months admitted to primary care hospitals of the canton of Bern, Switzerland.

Methods: We prospectively assessed demographic data, management, outcome and its' predictors of consecutive AIS patients during 12 months admitted to 18 primary care hospitals of the canton of Bern (969'299 inhabitants). Blinded follow-up was obtained 3 months after AIS by telephone interview. Primary outcome was case-fatality and favourable clinical outcome (modified Rankin scale (mRS) ≤ 2) at 3 months. We further analysed predictors of length of hospital stay using linear regression and cumulative mortality and favourable outcome at 3 months using logistic regression.



Results: From December 2007 to December 2008 807 AIS patients were included. Thrombolysis was performed in 107 of 807 patients (13%). Age ≥ 75 years and NIHSS ≥ 10 were independently associated with a longer hospital stay, whereas inhospital death and thrombolysis shortened length of hospitalisation. Estimated cumulative mortality at three months was 15.6%. Age ≥ 85 years, NIHSS ≥ 12 and comorbid conditions were independent predictors of mortality. We estimated that at 3 months 53.9% of patients had a favourable outcome. Age < 75 years, male sex, NIHSS < 10 , absence of diabetes and lower Charlson comorbidity index and thrombolysis were independent predictors of favourable outcome.



	N = 807
Female sex, n (%)	361 (44.7)
Mean age (SD)	72.3 (14.5)
Age ≤ 54 years	106 (13)
Age 55-74 years	271 (34)
Age ≥ 75 years	428 (53)
First-ever incident stroke, n (%)	642 (79.5)
Median NIHSS (range)	5 (0-40)
Charlson Comorbidity Index, mean (SD)	2.7 (4.3)
Follow-up at 3 month, n (%)	N = 579
At home	373 (64.4)
Rehabilitation facility	20 (3.5)
Nursing home	53 (3.5)
Hospital	16 (2.8)
Dead	117 (20.2)
Functional outcome at 3 months	N = 579
mRS 0-2	295 (51)
mRS 3-6	284 (49)

	Regression Coefficient (95% CI)	p-value
Death in hospital (yes vs no)	-5.63 (-8.09 - 3.17)	<0.001
Male sex (vs female)	-0.59 (-2.01 - 0.82)	0.407
Age < 45 years	1	
Age 45-54 years	1.55 (-2.22 - 5.33)	0.419
Age 55-64 years	1.79 (-1.70 - 5.29)	0.314
Age 65-74 years	2.54 (-0.76 - 5.85)	0.132
Age 75-84 years	4.99 (1.69 - 8.28)	0.003
Age 85-94 years	4.67 (1.13 - 8.20)	0.001
Age >95 years	2.93 (-3.94 - 9.81)	0.402
NIHSS 0	0	
NIHSS 1-3	0.23 (-2.29 - 3.35)	0.885
NIHSS 4-9	3.99 (0.79 - 7.19)	0.014
NIHSS 10-11	4.53 (0.14 - 8.92)	0.043
NIHSS ≥ 12	5.49 (2.12 - 8.86)	0.001
Family history of stroke (yes vs no)	-0.17 (-2.06 - 1.72)	0.861
Family history of MI (yes vs no)	-0.19 (-2.24 - 1.86)	0.857
Diabetes mellitus (yes vs no)	0.53 (-1.38 - 2.44)	0.585
Current smoking (yes vs no)	1.30 (-0.56 - 3.16)	0.169
Hyperlipidemia (yes vs no)	-1.04 (-2.85 - -0.43)	0.165
Hypertension (yes vs no)	-0.57 (-2.31 - 1.18)	0.526
Thrombolysis (yes vs no)	-3.80 (-5.25 - -0.82)	0.007
Charlson Index (per unit increase)	0.17 (0.02 - 0.36)	0.085
Constant	6.82 (2.89 - 10.76)	0.001

	Odds Ratio (95% CI)	p-value
Inhospital stroke (vs prehospital)	2.31 (0.82 - 6.47)	0.112
Male sex (vs female)	1.07 (0.59 - 1.89)	0.828
Age < 45 years	1	
Age 45-54 years	1.47 (0.23 - 9.36)	0.685
Age 55-64 years	1.46 (0.26 - 8.37)	0.668
Age 65-74 years	1.02 (0.17 - 6.19)	0.979
Age 75-84 years	3.62 (0.69 - 19.14)	0.129
Age 85-94 years	6.52 (1.19 - 35.85)	0.031
Age >95 years	23.89 (3.77 - 151.15)	0.008
NIHSS 0	1	
NIHSS 1-3	0.25 (0.06 - 1.09)	0.064
NIHSS 4-9	0.42 (0.09 - 1.76)	0.234
NIHSS 10-11	1.76 (0.35 - 8.73)	0.489
NIHSS ≥ 12	6.35 (1.69 - 23.81)	0.006
Family history of stroke (yes vs no)	0.73 (0.31 - 1.75)	0.483
Family history of MI (yes vs no)	2.11 (0.79 - 5.57)	0.133
Diabetes mellitus (yes vs no)	1.04 (0.49 - 2.21)	0.914
Current smoking (yes vs no)	1.31 (0.60 - 2.87)	0.495
Hyperlipidemia (yes vs no)	0.84 (0.46 - 1.51)	0.549
Hypertension (yes vs no)	1.03 (0.51 - 2.07)	0.927
Thrombolysis (yes vs no)	0.69 (0.31 - 1.58)	0.388
Charlson Index (per unit increase)	1.10 (1.04 - 1.17)	0.002

	Odds Ratio (95% CI)	p-value
Inhospital stroke (vs prehospital)	0.82 (0.26 - 2.59)	0.733
Male sex (vs female)	2.02 (1.28 - 3.18)	0.003
Age < 45 years	1	
Age 45-54 years	1.58 (0.52 - 4.81)	0.421
Age 55-64 years	0.52 (0.19 - 1.42)	0.201
Age 65-74 years	0.49 (0.19 - 1.22)	0.124
Age 75-84 years	0.17 (0.07 - 0.42)	0.0001
Age 85-94 years	0.14 (0.05 - 0.38)	0.0001
Age >95 years	0.10 (0.006 - 1.89)	0.126
NIHSS 0	1	
NIHSS 1-3	0.33 (0.11 - 1.03)	0.056
NIHSS 4-9	0.19 (0.06 - 0.59)	0.005
NIHSS 10-11	0.04 (0.01 - 0.17)	<0.0001
NIHSS ≥ 12	0.02 (0.01 - 0.09)	<0.0001
Family history of stroke (yes vs no)	1.14 (0.63 - 2.06)	0.653
Family history of MI (yes vs no)	1.03 (0.56 - 1.91)	0.922
Diabetes mellitus (yes vs no)	0.49 (0.26 - 0.90)	0.022
Current smoking (yes vs no)	1.10 (0.65 - 1.88)	0.717
Hyperlipidaemia (yes vs no)	1.44 (0.89 - 2.33)	0.132
Hypertension (yes vs no)	1.17 (0.69 - 2.01)	0.549
Thrombolysis (yes vs no)	2.64 (1.25 - 5.57)	0.011
Charlson Index (per unit increase)	0.92 (0.87 - 0.97)	0.004

Results from linear regression analysis for mean differences in length of hospital

Predictors of mortality at 3 months (multivariable logistic regression analysis)

Predictors of good outcome (mRS 0-2) at 3 months (multivariable logistic regression analysis)

Conclusions: Thirteen percent of AIS patients admitted to Bernese hospitals underwent thrombolysis, which exerted a measurable effect on stroke outcome in this large population and not only for single patients. Age < 75 years, lesser stroke severity, absence of diabetes, lower CCI, male sex and thrombolysis independently predicted favourable outcome.