

Online Supplemental Data

Supplemental Table 1. Clinical characteristics of patients that underwent emergency MRI for dizziness or vertigo by imaging outcome group: acute ischemic stroke (AIS), significant (S) and non-significant (NS).

	AIS <i>N</i> = 197	S <i>N</i> = 97	NS <i>N</i> = 875	<i>p</i>-value
Age [years], median (IQR)	69 (58–75.5)	57 (37.5–70)	59 (42–70)	<0.01
Sex [male], <i>N</i> (%)	115 (58)	36 (37)	372 (43)	<0.01
Inpatients, <i>N</i> (%)	148 (75)	59 (61)	452 (52)	<0.01
Number of cardiovascular risk factors, median (IQR)	1 (0–2)	0 (0–1)	0 (0–1)	<0.01
Prevalence of cardiovascular risk factors, <i>N</i> (%)				
Smoking	21 (11)	8 (8)	78 (9)	0.71
Hypertension	86 (44)	23 (24)	286 (33)	<0.01
Hypercholesterolemia	42 (21)	7 (7)	144 (17)	<0.01
Diabetes	39 (20)	6 (6)	89 (10)	<0.01
Coronary artery disease	14 (7)	7 (7)	53 (6)	0.80
Old cerebral infarction	29 (15)	4 (4)	38 (4)	<0.01
Duration of symptoms [days], median (IQR)	1 (0–3)	4 (1–14)	1 (0–4)	<0.01
Duration of symptoms < 2 days, <i>N</i> (%)	116 (59)	31 (32)	484 (55)	<0.01
Prevalence of symptoms, <i>N</i> (%)				
Previous episodes	10 (5)	6 (6)	58 (7)	0.72
Vertigo	29 (15)	10 (10)	225 (26)	<0.01
Positional vertigo	7 (4)	3 (3)	72 (8)	0.02
Auditory symptoms	7 (4)	9 (9)	32 (4)	0.03
Nausea/vomiting	82 (42)	42 (43)	357 (41)	0.88
Headache	35 (18)	35 (36)	203 (23)	<0.01
Pre-syncope	2 (1)	2 (2)	11 (1)	0.75
Number of neurological signs, median (IQR)	1 (0.5–2)	1 (0–1)	1 (0–1)	<0.01
Prevalence of neurological signs, <i>N</i> (%)				
Limb weakness	22 (11)	10 (10)	63 (7)	0.13
Facial weakness	9 (5)	3 (3)	32 (4)	0.78
Paresthesia	24 (12)	10 (10)	113 (13)	0.75
Ataxia	43 (21)	12 (12)	85 (10)	<0.01
Aphasia or dysarthria	47 (23)	14 (14)	65 (7)	<0.01
Dysphagia	8 (4)	0 (0)	5 (1)	<0.01
Diplopia	40 (20)	12 (12)	102 (12)	<0.01
Nystagmus	56 (28)	11 (11)	281 (32)	<0.01
No other symptoms or neurological signs than dizziness, <i>N</i> (%)	18 (11)	12 (14)	96 (11)	0.40

IQR, interquartile range

P-values are associated with *Chi-squared* test for categorical variables, and with *Kruskal–Wallis H* test for continuous variables

Supplemental Table 2. Statistical test values and their statistical significance between dichotomic imaging outcome groups.

Variable	AIS/S vs. NS	AIS vs. S/NS	AIS vs. NS	S vs. NS
Age	6.03**	7.85**	7.83**	-0.20
Sex	6.97**	17.82**	16.32**	1.05
Hospitalization status	31.46**	33.88**	35.94**	2.94
Number of cardiovascular risk factors	2.31*	4.43**	4.14**	-1.81
<i>Cardiovascular risk factors</i>				
Smoking	0.24	0.65	0.56	0.05
Hypertension	1.90	10.31**	8.54**	3.24
Hypercholesterolemia	0.01	3.98*	2.65	5.68*
Diabetes	5.72*	16.22**	14.17**	1.57
Coronary artery disease	0.44	0.24	0.30	0.20
Old cerebral infarction	18.3**	31.06**	29.56**	0.01
Duration of symptoms	2.24*	-1.68	-0.85	5.54**
<i>Symptoms</i>				
Previous episodes	0.52	0.63	0.65	0.03
Vertigo	19.51**	8.38**	10.75**	11.3**
Positional vertigo	7.86**	4.35*	5.15*	3.23
Auditory symptoms	1.78	0.18	0.01	6.83**
Nausea/vomiting	0.17	0.02	0.05	0.23
Headache	0.05	4.13*	2.75	7.84**
Pre-syncope	0.02	0.13	0.08	0.43
<i>Neurological signs</i>				
Number of neurological signs	3.44**	5.53**	5.33**	-1.41
Limb weakness	4.00*	2.93	3.47	1.22
Facial weakness	0.11	0.42	0.36	0.08
Paresthesia	0.37	0.03	0.08	0.54
Ataxia	16.88**	21.81**	22.44**	0.69
Aphasia/dysarthria	40.60**	42.15**	46.39**	5.74*
Dysphagia	9.25**	18.74**	16.34**	0.56
Diplopia	7.00**	10.53**	10.46**	0.04
Nystagmus	9.15**	0.20	1.02	17.93**
No other symptoms or neurological signs than dizziness or vertigo	0.89	0.93	0.75	0.50

** $p < 0.01$; * $p < 0.05$

Chi-squared test was used for categorical variables and *Mann-Whitney U* test for continuous variables

Supplemental Table 3. Significant, but non-ischemic emergency MRI findings.

Finding	N (%)
Tumor/metastases	44 (45)
Demyelination	12 (12)
Neurosarcoidosis	1 (1)
Normal pressure hydrocephalus	1 (1)
Central pontine myelinolysis	1 (1)
Posterior reversible encephalopathy syndrome	1 (1)
Subdural hygroma	1 (1)
Chiari malformation type 1	1 (1)
Corpus pineale apoplexy	1 (1)
Leukoencephalopathy	1 (1)
Wernicke encephalopathy	1 (1)
<i>Vascular diseases</i>	
Intracranial hemorrhage	6 (6)
CADASIL	1 (1)
Carotid artery dissection	1 (1)
Vertebral artery dissection	1 (1)
Giant aneurysm	1 (1)
Subdural hematoma	1 (1)
Septic embolism	1 (1)
Sinus thrombosis	1 (1)
<i>Infection, inflammation</i>	
Mastoiditis	7 (7)
Encephalitis	3 (3)
Central nervous infection	3 (3)
Labyrinthitis	3 (3)
Cerebellitis	1 (1)
Meningitis	1 (1)
Neuritis	1 (1)
Total	97 (100)

Supplemental Table 4. Non-significant emergency MRI findings.

Finding	N (%)
Unremarkable	368 (42)
White matter hyperintensities	256 (29)
<i>Known existing pathology</i>	
Old infarcts/bleeds	105 (12)
Traumatic lesions	1 (1)
Infarction and multiple sclerosis	1 (1)
Tumor	1 (1)
Ear pathology	1 (1)
Sinonasal mucosal thickening	39 (4)
Benign cyst	20 (2)
Perivascular abnormalities	16 (2)
Normal variant	13 (1)
Aneurysm	9 (1)
Sinusitis	9 (1)
Vascular stenosis	8 (1)
Meningioma	8 (1)
Chronic demyelination	6 (1)
Cavernoma	5 (1)
Empty sella	4 (0)
Cranial abnormality	2 (0)
Incidental benign tumor	2 (0)
Teleangiectasia	1 (0)
Total	875 (100)

Supplemental Table 5. Variables predicting significant acute pathology (AIS/S) in emergency MRI with statistical significance ($p < 0.05$) in a multivariate analysis.

Variable	Risk score points	OR	95% CI (lower–upper)	<i>p</i> -value
Aphasia/dysarthria	3	3.2	2.1–4.9	<0.01
Ataxia	2	2.3	1.5–3.6	<0.01
Old cerebral infarction	2	2.2	1.3–3.8	<0.01
Auditory symptoms	2	2.1	1.1–4.0	0.04
Inpatient	2	1.9	1.3–2.6	<0.01
Diplopia	2	1.7	1.1–2.5	0.02
Nausea/vomiting	2	1.6	1.2–2.3	<0.01
Age over 55 years ¹	2	1.6	1.1–2.3	0.01
Male	1	1.4	1.0–1.9	0.03
No vertigo	2 ²	0.5	0.3–0.8	<0.01

OR = odds ratio, CI = confidence interval.

¹Age cut-off point determined with Youden's *J* statistic.

²Risk score points are calculated for absence of vertigo: 1/OR rounded.

Supplemental Table 6. Variables predicting acute ischemic stroke in emergency MRI with statistical significance ($p < 0.05$) in a multivariate analysis.

Variable	Risk score points	OR	95% CI (lower–upper)	<i>p</i> -value
Dysphagia	5	4.7	1.4–16.2	0.02
Aphasia/dysarthria	3	3.3	2.1–5.2	<0.01
Old cerebral infarction	3	2.9	1.7–5.0	<0.01
Ataxia	3	2.8	1.7–4.3	<0.01
Age over 55 years ¹	2	2.3	1.4–3.6	<0.01
Inpatient	2	2.0	1.3–2.9	<0.01
Diplopia	2	1.9	1.2–3.0	<0.01
Male	2	1.7	1.2–2.5	<0.01
Diabetes	2	1.7	1.0–2.8	0.04
Symptoms <2 days	2	1.5	1.1–2.2	0.02
Vertigo	2 ²	0.6	0.4–1.0	0.048

OR = odds ratio, CI = confidence interval.

¹Age cut-off point determined with Youden's *J* statistic.

²Risk score points are calculated for absence of vertigo: 1/OR rounded.

An example calculation of a risk score predicting AIS for a single patient.

- 86 years of age	2 points
- Male	2 points
- Inpatient	2 points
- No vertigo	2 points
- Ataxia	3 points
<u>Total</u>	<u>11 points</u>

Supplemental Table 7. Detailed MRI protocol.

Sequence	Orientation	Slice thickness	Parameters
T2	Axial	3 mm	TE 80 ms TR 4300 ms
FLAIR	Coronal	4 mm	TE 125 ms TR 11000 ms TI 2800 ms
T1 3D TFE	Axial	1 mm	TE 4 ms TR 8.5 ms
DWI	Axial	4 mm	TE 87 ms TR 4500 ms $b=1000 \text{ s/mm}^2$
SWI	Axial	2 mm	TE 28 ms TR 20 ms
3D-TOF arterial angio	Axial	1.2 mm	TE 3.5 ms TR 23 ms
DRIVE	Axial	0.8 mm	TE 186 ms TR 1500 ms