

H.1.1.1 Dizziness and vertigo

Reference	Navi BB <i>et al.</i> 2012. Rate and Predictors of Serious Neurologic Causes of Dizziness in the Emergency Department. Mayo Clinic Proc. 87(11): 1080-1088																		
Study type and analysis	<ul style="list-style-type: none"> • Retrospective cohort • Multivariable logistic regression 																		
Number of participants and characteristics	<p>n=907 collated from a single source by reviewing an electronic database of medical records for consecutive patients presenting with dizziness, vertigo or imbalance to a single centre (emergency department of tertiary care hospital)</p> <p>Eligible records were randomly assigned to 1 of 6 data abstractors, who were all neurologists (4 board-certified fellows and 2 third-year neurology residents). Variables that were missing or not mentioned in clinical notes were considered not to be present.</p> <p>Serious neurologic diagnoses were defined as any of the following: ischemic stroke, TIA, intracerebral haemorrhage, subarachnoid haemorrhage, subdural haemorrhage, epidural haemorrhage, brain neoplasm, seizure, demyelinating disease, and brain abscess or meningitis.</p> <p>Other diagnoses included: peripheral vertigo, benign paroxysmal positional vertigo, vestibular neuronitis, Meniere’s disease, concussion, migraine, gait disorder, orthostasis or presyncope, syncope, dizziness, psychiatric disorder, arrhythmia, acute coronary syndrome, stable angina, congestive heart failure exacerbation, hypertensive emergency, drug or substance ingestion or withdrawal, hypoglycaemia, electrolyte disorder, anaemia or gastrointestinal bleeding and systemic infection.</p> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="border-bottom: 1px solid black;">Risk factor</th> <th style="border-bottom: 1px solid black;">Serious neurological diagnoses (n=49)</th> <th style="border-bottom: 1px solid black;">Other diagnoses (n=858)</th> <th style="border-bottom: 1px solid black;">Total (n=907)</th> </tr> </thead> <tbody> <tr> <td>Migraines</td> <td>3</td> <td>51</td> <td>54</td> </tr> <tr> <td>Nausea or vomiting</td> <td>19</td> <td>402</td> <td>421</td> </tr> <tr> <td>Light-headedness</td> <td>19</td> <td>290</td> <td>309</td> </tr> </tbody> </table>			Risk factor	Serious neurological diagnoses (n=49)	Other diagnoses (n=858)	Total (n=907)	Migraines	3	51	54	Nausea or vomiting	19	402	421	Light-headedness	19	290	309
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	Headache	9	181	190
	Gait disturbance	23	130	153
	Visual disturbance besides diplopia	7	92	99
	Dyspnoea	4	76	80
	URI symptoms	2	67	69
	Sensory disturbance	6	62	68
	Chest pain	2	67	69
	Psychiatric symptoms	1	65	66
	Tinnitus	6	48	54
	Syncope	3	47	50
	Confusion	3	37	40
	Hearing loss	1	35	36
	Speech disturbance	10	15	25
	Diplopia	7	16	23
	Unilateral weakness	9	8	17
	Dix–Hallpike manoeuvre documented (abnormal)	4 (1)	145 (81)	149 (82)
	<p>Inclusion criteria: people aged 18 years or older who visited the emergency department between January 2007 and December 2009, with any of the following reported triage symptoms as the primary symptom: dizzy, dizziness, vertigo, spinning, imbalance, or disequilibrium.</p> <p>Exclusion criteria: primary symptoms not included in the above list (determined by independent review by 2 neurologists). Additional eligible emergency department visits by a person already included in the study were not recorded.</p> <p>Additional population details: 628 people (69%) presented with a triage symptom of 'dizzy' or 'dizziness', 240 (26%) with 'vertigo' or 'spinning', and 39 (4%) with 'imbalance' or 'disequilibrium'. Isolated dizziness was present in 169 (19%) and nystagmus in 81 (9%) people Laboratory evaluation was performed in 703 (78%), ECG in 612 (68%) and neuroimaging in 321 (28%) patients</p>			

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	<p>Diagnosis: there was 72% agreement on the diagnosis of serious neurologic disease between the 2 assessors (disagreements resolved by a third reviewer)</p> <p>Mean (SD) age: of 59 (19) years</p> <p>Male/female: 42/58%</p> <p>Median duration of symptoms: 1 day (IQR: 0-2 days)</p> <p>Previous episodes of dizziness: 295 (33%)</p>		
	Serious neurological diagnoses (n=49)	Other diagnoses (n=858)	Total (n=907)
	Comorbidities		
	36	411	447
	24	227	251
	7	124	131
	10	81	91
	8	69	77
	8	46	54
	1	24	25
	1	9	10
Clinical predictors	<p><i>A priori</i> potential predictors of outcome were:</p> <ul style="list-style-type: none"> • age • diabetes mellitus • Dix–Hallpike manoeuvre • focal examination abnormalities (any neurologic sign besides nystagmus, for example, gait disturbance, limb or facial weakness, limb ataxia) • imbalance as the reference triage symptom • isolated dizziness symptoms • positional symptoms • previous stroke. 		

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Confounders OR stratification strategy	See predictors above (also considered as confounders) Only predictors that were significantly ($p < 0.10$) associated with the outcome in univariate analysis were included in the final multivariate model: <ul style="list-style-type: none"> • age • imbalance as the triage symptom • isolated dizziness • previous stroke • focal examination abnormalities.
Outcomes and effect sizes	Odds ratios (95% CI) for serious neurologic disease versus other diagnosis in multivariate analysis Focal examination abnormality: 5.9 (3.1-11.2) Age ≥ 60 years: 5.7 (2.5-13.4) Imbalance as triage symptom: 5.9 (2.3-15.2) Previous stroke: 2.0 (0.8-5.0) Isolated dizziness: 0.2 (0.0-0.7)
Comments	Risk of bias assessments: Selection bias – VERY HIGH (not all plausible confounders considered; for example, headache, vomiting, nystagmus and intermittency of dizziness are absent from the analysis, and just less than 10 events per variable) Detection bias – MODERATE (6 raters assessed the risk factors and lack of adjustment for inter-rater measurements errors but data abstraction used standardised forms optimised for reliability of data abstraction and a data dictionary provided for reference to answer potential queries) Attrition bias – LOW Overall: very serious risk of bias