

# Summary

Dizziness in older patients in general practice:  
a diagnostic challenge

Summary

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Dizziness is a common symptom among older persons. Thirty percent of people above 65 years of age experience some form of dizziness, increasing to 40-50% of persons above 80 years of age. For general practitioners dizziness often represents a diagnostic challenge: it is a subjective sensation that depends on self-report, it may refer to several different and overlapping sensations, and it can be caused by a wide range of benign or serious conditions. Often, dizziness has more than one cause, especially in older patients. Although patients with dizziness are managed largely in general practice (Dutch general practitioners refer less than 5% of dizzy patients to a medical specialist), most previous studies on dizziness were performed among patients not representative of patients seen in general practice. Practice guidelines on dizziness recommend the use of many diagnostic tests, like the measurement of pulse and blood pressure, or the Dix-Hallpike manoeuvre. However, these (often contradictory) recommendations are mainly authority-based and lack empirical evidence. Furthermore, despite the high prevalence of dizziness among older persons, no guideline on dizziness provides specific information about the diagnostic approach of older dizzy patients. The principle aim of this thesis was to obtain more insight into the epidemiology of dizziness in older patients, and to provide clinical guidance in the diagnostic approach of older dizzy patients in general practice.

In *Chapter 1* we describe the context of this thesis, including the definition of dizziness, the epidemiology of dizziness, dizziness in older persons, the impact of dizziness, diagnosing dizziness, and the study Dizziness In Elderly Patients (DIEP). The chapter ends with a description of the objectives and the outline of this thesis.

In *Chapter 2* we used the data from the Second Dutch National Survey of General Practice to investigate the prevalence and incidence of dizziness reported by older patients in general practice, to describe the final diagnoses as recorded by general practitioners, and to compare the clinical characteristics of dizzy patients with those of non-dizzy patients. A total number of 195 general practitioners in 104 practices across the Netherlands recorded all contacts with patients during 12 consecutive months. For the identification of dizzy patients we developed a search strategy based on Dutch synonyms for dizziness. The one-year prevalence of dizziness in general practice in patients aged 65 or older was 8.3%. Dizziness was more common in women than in men, but this gender difference disappeared in the very old (patients aged 85 or older). The incidence of dizziness in general practice was 47.1 per 1000

R1 person-years. The incidence rates of all dizziness subtypes increased with age, except  
R2 for the subtype “vertigo”. For 39% of the dizzy patients the general practitioners did  
R3 not specify a diagnosis and recorded a symptom diagnosis as the final diagnosis.  
R4 Other groups of recorded diagnoses were cardiovascular disease (14%), peripheral  
R6 vestibular disease (12%), and psychiatric disease (6%). Living alone, lower level of  
R7 education, pre-existing cerebrovascular disease, and pre-existing hypertension were  
R8 independently associated with dizziness.

R9 In *Chapter 3* we searched the databases of MEDLINE, EMBASE, PsycINFO, CINAHL, and  
R10 Gerolit in order to assess and summarize the existing evidence about the accuracy  
R11 of diagnostic tests for evaluating dizziness in primary care. Two pairs of reviewers  
R12 assessed the methodological quality of the studies with the Quality Assessment of  
R13 Diagnostic Accuracy Studies (QUADAS) checklist. Of 29.285 articles, we identified  
R14 26 studies eligible for our systematic review: 25 studies on neuro-otologic tests and  
R15 one study on a psychiatric test. All diagnostic accuracy studies used some kind of  
R16 preselection of patients and were intended to diagnose specific conditions, such as  
R17 Ménière’s disease or peripheral vestibular dysfunction. All accuracy studies were at  
R18 least partially conducted in a secondary/tertiary care setting, and almost none of  
R19 the studies included a spectrum of patients representative of primary care patients.  
R20 The data of two diagnostic tests, the head-shaking nystagmus test (HSN) and the  
R21 head impulse test (HIT), were considered appropriate for pooled analysis. The pooled  
R22 sensitivity of the HSN was 45% (95% CI, 30-62%), the specificity 82% (95% CI, 68-  
R23 90%), and the LR+ 2.5 (95% CI, 1.5-4.1). The pooled sensitivity of the HIT was 63%  
R24 (95% CI, 40-81%), the specificity 93% (95% CI, 83-98%), and the LR+ 9.3 (95% CI,  
R25 4.3-20.2).

R26 The results presented in Chapter 3 laid the foundation of the Delphi procedure  
R27 described in *Chapter 4*. During this consensus procedure, an international panel of  
R28 16 experts in the field of dizziness used the collected evidence to select 21 out of  
R29 37 diagnostic tests for evaluating dizziness in older patients in general practice. Five  
R30 diagnostic tests were excluded, although they are recommended by existing practice  
R31 guidelines on dizziness (auscultation of the carotids, toe and heel gait, one-leg stance  
R32 test, the timed ‘up and go’ test, and carotid sinus massage), two tests were included,  
R33 although several guidelines question their diagnostic value (serum haemoglobin  
R34 level and non-capillary non-fasting blood glucose level), and two tests were included

that have never been recommended by practice guidelines on dizziness (Semmes-Weinstein Monofilament Test and Patient Health Questionnaire).

The resulting set of 21 diagnostic tests - as determined by the expert panel - was the starting point of a cross-sectional diagnostic study performed among 417 older dizzy patients, which we described in Chapters 5, 6, and 7.

In *Chapter 5* the test results of each dizzy patient were independently reviewed by a panel consisting of a general practitioner, a geriatrician, and a nursing home physician, in order to describe subtypes of dizziness and to assess contributory causes of dizziness in older patients in general practice. According to the panel, presyncope was the most common dizziness subtype (69%), followed by vertigo (41%), disequilibrium (40%), and other dizziness (2%). Forty-four percent of the patients were assigned more than one dizziness subtype. Cardiovascular disease was considered to be the most common major contributory cause of dizziness in older dizzy patients in general practice (57%), followed by peripheral vestibular disease (14%), and psychiatric disease (10%). In a quarter of all dizzy patients an adverse drug effect was considered to be a contributory cause of dizziness. Sixty-two percent of the patients were assigned more than one contributory cause of dizziness.

In *Chapter 6* we used principal component analysis (PCA) to establish an empirical classification of diagnostic subtypes/profiles of dizziness in older patients in general practice. Based on history, physical examination, and additional diagnostic tests, we identified six diagnostic profiles: "frailty", "psychological", "cardiovascular", "presyncope", "non-specific dizziness", and "ear, nose, and throat" (ENT). Seventy-six percent of the dizzy patients scored on more than one diagnostic profile. Additional information on physical examination and diagnostic tests hardly increased the explained variance (history alone 29.4% vs. history, physical examination and additional diagnostic tests 32.0%).

Dizzy patients with both psychological and physical symptoms tend to have high levels of disability and are at risk to remain symptomatic and disabled. In *Chapter 7* we used the results of the cross-sectional diagnostic study to develop a prediction model for the presence of anxiety and/or depressive disorder in older dizzy patients in general practice. An anxiety and/or depressive disorder was present in 22% of

R1 the patients. Dizziness-related disability was a strong diagnostic indicator of anxiety  
R2 and/or depression. Other diagnostic indicators of anxiety and/or depression were  
R3 accompanying fear and a history of depression (associated with an increased odds),  
R4 and tinnitus and rotational dizziness (associated with a decreased odds).

R6 In *Chapter 8* we put the results of this thesis in a wider perspective, reflecting on  
R7 expert opinion as a methodological instrument, the importance of being population-  
R8 aware, and the supposed benefit of additional diagnostic testing. Additionally, we  
R9 propose some ideas for future research. We end with recommendations for clinical  
R10 practice. First of all, we advocate a change of focus from vestibular to cardiovascular  
R11 disease when evaluating older dizzy patients in general practice. Second, we  
R12 recommend a systematic exploration of (categories of) causes of dizziness in order  
R13 to reveal contributory causes that are amenable to treatment. Third, we strongly  
R14 recommend to perform a medication check during the evaluation of older dizzy  
R15 patients in general practice. Finally, we recommend general practitioners to consider  
R16 the existence of anxiety and depression in older patients presenting with dizziness,  
R17 especially because patients with both psychological and physical symptoms tend to  
R18 have a worse prognosis and effective treatment is available.