Dizziness in older patients in general practice: away from diagnostic nihilism
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Chapter 1
General introduction
Jacqueline Dros
Even five-year-old children recognize dizziness and may describe it as “a strange feeling in the head” or “as if the world is turning”. Although describing mainly vertigo, they do understand the concept of dizziness. In fact, everyone has experienced dizziness at one time or another, but it remains a difficult concept to define and measure.

While dizziness in children can often easily be explained and is mostly associated with fun (with youngsters even willing to pay for it at a funfair, for example), this is unfortunately not the case in older people. Often in this group, dizziness cannot easily be explained and can be a very troublesome symptom, resulting in serious impairment in daily functioning, falls, social isolation, and eventually nursing home admission. The lack of evidence supporting the diagnostic process and the management of dizziness in older patients in particular encouraged us to study dizziness. This thesis therefore deals with the diagnostic and prognostic aspects of dizziness in older patients in general practice. This first chapter provides an introduction to dizziness in general and to dizziness as a symptom in general practice, with a focus on older patients. It ends with the aims and outline of this thesis.

**Describing and defining dizziness**

Dizziness refers to various abnormal sensations, and describes an uncomfortable, disturbed state of orientation in space. Normally, spatial orientation is assessed by continuous sensory monitoring, of which we are largely unaware. Five sensory modalities monitor our position and motion: vision, vestibular sensation, proprioception, touch and pressure sensation, and hearing. When spatial orientation is ambiguous, we become uncertain of our position or motion in space, and this is what we call dizziness. Dizziness can be physiological, for example when the limits of accurate sensory perception are exceeded, as is the case in the five-year-old spinning in a merry-go-round, but is pathological when sensory organs produce inadequate or contradictory information, or when central control mechanisms of the sensory systems function inaccurately. Additionally, abnormal motor function, with impaired monitoring of motion, can also contribute to the sensation of dizziness.

Drachman and Hart proposed four categories of dizziness, based on reported complaints and related to various causal mechanisms: vertigo, presyncope, disequilibrium, and “other dizziness”. In this classification, vertigo refers to a rotational or spinning sensation in which patients feel that either they or their environment are rotating. Presyncope refers to a sensation of light-headedness, nearly fainting or impending loss of consciousness. Disequilibrium refers to a sensation of unsteadiness and impaired balance and gait, prominent when standing or walking, and strictly in the absence of abnormal head sensation. Finally, “other dizziness” is far less well-defined, not covered by the above-
mentioned sensations and may include floating or swimming sensations or feelings of dissociation. This classification is frequently used and appears to be generally accepted. However, it is based on pathophysiological assumptions, not on empirical evidence. Another aspect of this typology is that the dizziness experienced by many patients, especially older ones, can be placed in more than one category. Older patients often experience a combination of several dizziness sensations, each with different frequency and intensity. Communicating dizziness symptoms can be difficult for them and this hinders placing their dizziness into categories.

Therefore we studied all types of dizziness. The definition of dizziness in this thesis includes the following terms frequently used by consulting patients in Dutch general practice: duizelig (dizzy), dizzy (dizzy), draaiend (giddy or rotational sensation), draaiduizelig (giddy or rotational sensation), licht in t hoofd (light-headedness), onzeker/onvast/wankel ter been (unsteadiness), zweverig (floating sensation), valneiging (unsteadiness), evenwichtstoornis (feeling of imbalance), gevoel flauw te vallen (impending faint), zwart voor de ogen (impending faint), and onwel worden (becoming unwell).

**Epidemiology of dizziness**

In more than 60 disorders (Appendix), dizziness is found to be a symptom and 90% of medications list dizziness as an adverse effect. Furthermore, many studies have described the epidemiology of dizziness in both community and general practice settings and in general practice, and, although they vary in their definition of dizziness, their findings are consistent regarding three aspects: 1) dizziness is common in all adult age groups, 2) the prevalence of dizziness increases with age, and 3) dizziness is more prevalent in women than in men. More specifically, the prevalence rates of dizziness in the community range from 1.8% in young adults to over 30% in people aged 65 years and older. Among consulting patients, 3% of all patients aged 25 to 44 years, 8% of patients over 65 years of age, and 18% of patients aged 85 years and older present with dizziness. Furthermore, compared with men, women report dizziness 1.5 to 3 times more frequently in all age groups, both in the community and in general practice.

**Dizziness in older patients in general practice**

In this thesis we focus on dizziness in older patients in general practice. Not only because dizziness is common and increases with old age, but, more important, because of its complexity and the lack of scientific evidence underlying the diagnosis and management of dizziness. The main reason for the complexity of dizziness in older patients is its multifactorial nature, with two-thirds of patients having more than one contributory cause of dizziness.
The multifactorial nature of dizziness in older patients and the difficulty of measuring dizziness complicate the disentanglement of various aetiological factors. Until now, of all patients presenting with dizziness in general practice 20-80% of them remain without a diagnosis. This complexity, in combination with the lack of evidence, causes feelings of uncertainty and diagnostic and therapeutic nihilism in many GPs. This is also reflected by the wide variation in interventions carried out by GPs in older patients with dizziness, including giving information and advice (30-38%), prescribing a drug (14-62%), performing additional testing (10%), and finally referring to another specialist (3-16%).

In fact, the main problem for GPs is to decide which patients with dizziness need additional testing (and which tests are useful), who should be referred to secondary care, who requires (immediate) therapy, and who should receive advice, reassurance and a “watchful waiting” approach.

Chronic versus acute dizziness in older patients in general practice

Dizziness can be a symptom of a wide spectrum of diseases, ranging from benign to serious and from acute to chronic conditions. Two-thirds of older patients presenting with dizziness experience symptoms which persist or recur (daily to monthly) for more than six months. Life-threatening conditions requiring immediate treatment are rare in patients with dizziness (<3%). In these mainly acute conditions - such as arrhythmia, stroke or intoxication - dizziness is almost never the only presenting symptom, and obtaining a careful patient history and performing a targeted physical examination is usually sufficient for triage. When indicated, further diagnostic testing should be done in a secondary care setting, although GPs should be familiar with the diagnostic tests that can be used as point-of-care tests for the diagnosis of the more common acute conditions, like arrhythmias and strokes (cerebellar or brainstem). Although acute dizziness will be discussed, the main focus of this thesis is on persistent and recurrent dizziness.

Objectives, study design and structure of this thesis

The main objectives of this thesis are (1) to review current knowledge about the yield of diagnostic tests used in dizzy patients in general practice, (2) to provide guidance for the diagnostic management of older dizzy patients in general practice, and (3) to study the prognosis of dizziness in older patients in general practice.

To develop and achieve these objectives we started the Dizziness In Elderly Patients (DIEP) research group, an initiative comprising researchers from the
Department of General Practice and the EMGO Institute of Health and Care Research, VU University Medical Centre (VUmc) and the Department of General Practice of the Academic Medical Centre (AMC) of the University of Amsterdam.

The initiation of the DIEP project was prompted by the publication of the practice guideline "Dizziness" by the Dutch College of General Practitioners in October 2002. This guideline revealed a lack of knowledge about aspects of patient history, diagnostic testing, and prognostic factors, especially in older age groups, which called for further research.

Chapter 2 presents an extensive systematic review of the literature on the accuracy of tests that can be used to evaluate dizziness in primary care patients.

In Chapter 3 we describe a Delphi procedure to reach consensus on the battery of tests that might contribute to the diagnostic evaluation of dizziness and that could be used in older patients presenting with dizziness in general practice. In Chapter 4 we analyse the results of the application of these tests to establish an empirical classification of diagnostic profiles of dizziness in older patients.

Chapter 5 offers a different presentation of the results of our standardised test evaluation, whereby a panel of experts reviewed the results for each patient with dizziness to establish categories of dizziness and contributing factors of dizziness.

In Chapter 6 we present the results of a case-control study, in which we identify and evaluate differences in diagnostic test results between older patients with and without dizziness. We assumed that, if there is no difference between the test results in patients with dizziness and those in patients without, the test may not be useful in diagnosing underlying causes of dizziness.

Despite the need to gain more insight into the prognosis of dizziness, few prospective studies have investigated the course of dizziness and dizziness-related impairment in patients and none in older patients in general practice. In Chapter 7 we therefore describe dizziness-related impairment in older patients in general practice and report on the identified factors related to this impairment. In Chapter 8 we determine the functional prognosis of dizziness in older patients in general practice after 6 months of follow-up. In addition, we report on the identification of predictors for persistent impairment due to dizziness and a risk score for GPs, using information collected in general practice and without knowing the precise cause(s).

Finally, in the general discussion (Chapter 9) reflections on the results and implications of the study are presented.
Appendix Differential diagnosis "dizziness"* 5;10;11;13

* = disorder for which medical help is warranted and should be diagnosed.
** = disease for which medical help is immediately warranted and which should be diagnosed instantly.

1. Vertigo
   *vestibular*
   - benign paroxysmal positional vertigo
   - cholesteatoma*
   - vestibular intoxication
   - labyrinthitis
   - labyrinthine concussion
   - Menière’s disease*
   - perilymphatic fistula*
   - tear in membranous labyrinth associated with trauma, surgery or infection
   - vestibular neuronitis
   - other vestibulopathy
   *cerebrovascular conditions*
   - migraine*
   *neurologic (excl. cerebrovascular conditions)*
   - head injury
   - lesions of the VIIIth cranial nerve*
   - acoustic neuroma/schwannoma*
   *infection*
   - herpes zoster oticus/Ramsay-Hunt syndrome**
   - neurosyphilis*
   - otitis externa*
   - otitis media*
   - otomastoiditis**
   - sinusitis
   *viral syndrome*
   *other*
   - adverse effects of drugs or alcohol
   - side-effect (medication)*
   - autoimmune* as part of a systemic autoimmune disorder
   - Cogan’s syndrome (inner-ear involvement + interstitial keratitis)
2. **(Pre)syncope**

- **cardiac disease**
  - arrhythmia
    - AV-conduction system disease*
    - inherited syndromes (long QT-syndrome/Brugada)*
    - malfunction implanted device (pacemaker/cardiac defibrillator)**
    - paroxysmal SVT/VT*
    - sinus node dysfunction (incl brady-/tachycardia)*
  - structural cardiac disease
    - cardiomyopathy*
    - myocardial ischemia/post infarction**
    - valvular disease*
- **carotid artery stenosis***
- **cerebrovascular conditions**
  - migraine*
  - subclavian steal syndrome* 
- **postural hypotension***
- **vasovagal conditions**
- **neurologic (excl. cerebrovascular conditions)**
  - autonomic failure syndrome
    - primary
      - multiple system atrophy (Shy-Drager syndrome)
    - secondary
      - diabetic neuropathy*
      - amyloid neuropathy
      - drugs/alcohol
  - head injury
  - normal pressure hydrocephalus*
  - tumours of brainstem and cerebellum*
- **reflex-mediated**
  - carotid sinus hypersensitivity
  - situational
    - acute haemorrhage**
    - cough
    - gastro-intestinal stimulation
    - micturition
    - post exercise
- **psychiatric conditions**
  - anxiety disorder*
  - depression*
  - panic disorder*
  - somatisation disorder*
- **other**
  - adverse effects of drugs or alcohol
  - side-effect (medication)*
  - gastrointestinal
    - diarrhea
    - GI bleed**
  - whiplash*
3. Disequilibrium
  cerebrovascular conditions
    cerebellar haemorrhage or infarction**
    lateral medullary infarction (Wallenberg’s syndrome)**
  neurologic (excl. cerebrovascular conditions)
    autonomic failure syndrome
      primary
      Parkinson’s disease*
      secondary
      diabetic neuropathy*
      drugs/alcohol
      Parkinson’s disease*
    spinocerebellar atrophy*
    tumours of brainstem and cerebellum*
  infection
    neurosyphilis*
  other
    adverse effects of drugs or alcohol
    side-effect (medication)*
    visual impairment*

4. Other
  neurologic (excl. cerebrovascular conditions)
    normal pressure hydrocephalus*
  metabolic
    electrolyte disturbance**
    thyroid disease*
    anaemia*
  psychiatric conditions
    anxiety disorder*
    depression*
    panic disorder*
    somatisation disorder*
  other
    adverse effects of drugs or alcohol
    side-effect (medication)*
    whiplash*
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