Long-term Prognosis of Patients Presenting First-ever Vestibular Symptoms in a Community-based Study

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Background: Vestibular symptoms (VSs) are frequent complaints in patients attending ambulatory care and the emergency room. They may represent a peripheral vestibular disorder or a stroke/transient ischemic attack (TIA), yet many patients have VSs that cannot be clearly classified at presentation. This study aims to characterize and determine the long-term prognosis of these patients. *Methods:* In a prospective community-based study involving 104,700 individuals registered at 4 health centers of Northern Portugal, patients with a first-ever-in-lifetime focal neurologic symptom (FNS) were ascertained using comprehensive methods, including referrals from physicians working in the study area and data retrieved from emergency/discharge records. Physicians were encouraged to report/notify any patient who might have experienced an FNS, including those with vertigo or vertigo-like symptoms, imbalance, presyncope, or nonspecific dizziness. After neurologic assessment patients were classified as having a peripheral vestibular symptom (pVS), a stroke/TIA, or an unclassified vestibular symptom (uVS). They were followed up 7 years after the index event at the outpatient clinic; predictors of survival free from stroke or vascular events were determined using Cox proportional hazards models. *Results:* Of the 1163 patients with an FNS, 360 (31.0%) were included, 16.7% had a stroke/TIA, 57.8% had pVS, and 25.6% had uVS. Most patients presented only isolated VSs (62.8%); 63% were women and mean age was 60.1 years (standard deviation = 16); hypertension (47.8%), hypercholesterolemia (41.9%), and diabetes (19.2%) were the most prevalent vascular risk factors (VRFs). Cranial computed tomography (CT) scan was performed in 63.3%. Adjusting for age, sex, VRFs, and diagnosis (TIA, pVS and uVS), the long-term risk of stroke was higher when CT showed silent infarctions (hazard rate [HR] = 3.96; 95% confidence interval [CI], 1.63-9.60) and the risk of vascular events (stroke, myocardial infarction, or vascular death) was higher in patients with 2 or more VRFs (HR = 2.70; 95% CI, 1.25-5.86). Identical results were obtained when restricting the model to patients with pVS or uVS. *Conclusions:* First-ever-in-lifetime VSs are common in patients with FNS and may represent a good opportunity for preventing a serious vascular event, particularly in patients with vascular comorbidity (silent infarctions and VRFs). **Key Words:** Vestibular symptoms—long-term prognosis—brain imaging—vascular risk factors—community-based study.

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Background

Vestibular symptoms (VSs), including dizziness, vertigo, or imbalance, are common in health care settings and could be the main complaint of patients with a stroke/TIA, predominantly in the vertebrobasilar artery territory.[1-3]

In clinical practice, the approach to the "dizzy patient" is based on the quality of the symptom, distinguishing those with vertigo (spinning or motion, concerning a vestibular disorder), presyncope (impending faint, concerning a cardiac disorder), imbalance (unsteadiness, concerning a central nervous system disorder), and nonspecific dizziness (any other dizziness).[4] In most of the world medical centers, brain computed tomography (CT) scan is still the most available imaging tool used to investigate patients with acute VSs when a central nervous system disorder is thought. Despite the availability, brain CT scan has low accuracy in the identification of acute stroke in the posterior fossa.[5] Even diffusion weighted imaging-magnetic resonance (DWI-MR) has a high false-negative rate in acute vertebrobasilar stroke (around 20%), more often when lesions are located in the brain stem.[6-7] Therefore, diagnosis is manly based on clinical grounds and many recent publications have concerned an effort to improve bedside diagnosis.[8-11] Even so, the distinction between possible etiologies for VS is often difficult, especially when more complex presentations involve other comorbidities that may impair a definitive diagnosis. Prospective community registries are adequate to describe the prognosis of these patients, avoiding the selection bias present in hospital cohorts. This study addresses 2 relevant issues. First, to estimate how many ischemic events are expected in patients with first-ever-in-life VS and their relative importance in stroke/TIA incidence; second, to understand the seriousness of unclassified vestibular symptoms (uVSs) by looking at the 7-year outcomes of these patients, compared with those presenting with ischemic or peripheral etiology.

Methods

The ACINrpc (prospective community register of neurologic attacks) included all first-ever-in-life stroke or transient focal neurologic symptoms (FNSs) which could be attributed to a dysfunction of the central nervous system, in individuals registered at 4 health centers (HCs) of Northern Portugal, 86,023 residents in the city of Porto and 18,677 in a rural municipality, between the October 1, 1998, and the September 30, 2000. For case ascertainment, "hot and cold pursuit" methods were used.[12] These included referrals from general practitioners and other physicians working at HC/hospitals within the study area, mainly at the emergency room, as well as data retrieved from admission/discharge or outpatient clinical records. Contacts were also established with nursing homes and senior residences; death certificates respecting these populations were consulted. More detailed aspects are described elsewhere.[13-14] General practitioners were encouraged to report/notify any patient presumed to have experienced an FNS, including those with vertigo or vertigo-like symptoms, imbalance, presyncope, or nonspecific dizziness. For reporting patients to the study center, a predefined form was used including demographic/social information, details of symptoms onset, and up to 4 major complaining symptoms. After neurologic assessment we excluded those who presented symptoms after head trauma, who contemporaneously to the FNS had ear or central nervous system infection, and those who presented with a presyncope associated with a medical disorder such as hypoglycemia, severe anemia, hypotension, drug intoxication, or acute/decompensated cardiac disorder. Patients with previous similar FNS or stroke were also excluded.

Patients were observed by a research team neurologist as soon as possible after the acute event and followed up at 3 months, 1 year, and 7 years. The investigation and treatment of each patient was under the responsibility of the assistant physician (HC/hospital). In case of a central nervous system disease, patients were regularly followed as outpatient by a research team neurologist. The 7-year follow-up was done preferentially at the neurology outpatient clinic; when that was not possible, a telephone contact and/or revision of hospitals'/HC' clinical records was conducted. If no information was available, the patient was considered lost to follow-up. Informed consent was obtained from each participant or from the next of kin, when appropriate, before any clinical assessment. Patients who expressed their unwillingness to participate were excluded (refusals).

Definitions

For all patients included whose 4 major complaints included VS, the presenting symptoms were grouped as follows: (1) isolated VS (with or without nausea/vomiting); (2) VS plus other FNSs; (3) VS plus tinnitus/hypoacusis; (4) VS plus generalized non-FNSs (generalized weakness, faintness or confusion); and (5) VS plus cephalalgia. According to diagnosis/etiology based on clinical criteria, patients were classified with: (1) Stroke/TIA; (2) Peripheral vestibular symptom (pVS), including benign paroxysmal positional vertigo or labyrinthitis; and, (3) unclassified vestibular symptom (uVS) when none of the previous or any other determined diagnosis was established. Stroke was defined according to the World Health Organization criteria.[15] In this cohort, stroke was diagnosed in patients presenting an acute vestibular syndrome associated with "other" central nervous signs, with or without acute symptomatic lesion on CT or magnetic resonance imaging (MRI), and ischemic stroke subtype was defined according to the Oxfordshire