A New Approach to the Diagnosis of Acute Dizziness in Adult Patients

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KEYWORDS

• Dizziness • Vertigo • BPPV • Vestibular neuritis • Nystagmus
• Posterior circulation stroke

KEY POINTS

- Use timing and triggers to identify which vestibular syndrome a patient has.
- Use the physical examination to differentiate vestibular neuritis from posterior circulation stroke in patients with the acute vestibular syndrome (AVS).
- Diagnose and treat benign paroxysmal positional vertigo (BPPV) at the bedside.

INTRODUCTION

Approximately 3.5% of emergency department (ED) visits are for dizziness.[1,2] Numerous conditions, some benign and self-limiting and others extremely serious, can present with dizziness. This is classic emergency medicine — sorting out the large majority of patients with a given chief complaint who have a self-limiting or easily treatable condition from the smaller number who have life-threatening, limb-threatening, or brain-threatening problems. Increasingly, physicians are charged with performing this diagnostic process using fewer resources. As of 2013, the direct ED-related costs of care for patients with dizziness in the United States was estimated to approach $4 billion.[3] In addition to economic cost, there is additional cost in terms of patient-experienced anxiety and falls, attributed to dizziness, with their resultant morbidity.

Compared with patients without dizziness, in the ED, dizzy patients undergo more testing and more imaging, have longer ED lengths of stay, and are more likely to be admitted. The large majority of brain imaging is CT, which has little diagnostic value in patients with dizziness. In 2011, approximately 12% of the estimated $4 billion is related to brain imaging, three-quarters of which was due to CT.[3]

The existing paradigm for diagnosing dizziness is based on symptom quality (ie, asking the question, "What do you mean 'dizzy'?"). This approach is taught in nearly

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all review articles and textbooks across specialties; however, newer research has shown that its scientific basis and its internal logic lack foundation.

Currently, misdiagnosis in patients with dizziness is a problem in an environment that is paying increasing attention to diagnostic errors.[4] Misdiagnosis of patients with cerebellar stroke can have disastrous consequences.[5] This article reviews the differential diagnosis of acute dizziness in adult patients, analyzes the origin of the traditional symptom quality approach to dizziness, reviews newer data on an approach to diagnosis of dizziness, and suggests a new approach.

The new approach places a heavy emphasis on history and physical examination. Using these techniques, emergency physicians can improve the care of patients with dizziness by more frequently and confidently making a specific diagnosis. When a confident diagnosis is made of a peripheral problem, time-consuming consultation, expensive imaging, and hospitalization become unnecessary. When the evaluation suggests a central problem, especially stroke, steps can be taken to diagnose and treat the offending vascular lesion and institute secondary prevention measures.

This new approach to the ED patients with dizziness should improve diagnostic accuracy, reduce length of stay and resource utilization, and likely improve overall patient outcomes.

DIFFERENTIAL DIAGNOSIS OF ACUTE DIZZINESS

Part of the problem is that numerous disorders and conditions that span multiple organ systems can present with acute dizziness. Many of these diagnoses are benign whereas others are life threatening. A study from the National Hospital Ambulatory Medical Care Survey (NHAMCS) database of patients seen in all varieties of hospitals over a 13-year period identified 9472 patients with dizziness.[2] These data suggest that most patients have general medical (including cardiovascular) diagnoses (approximately 50%), otovestibular diagnoses (approximately 33%), and neurologic (including stroke) diagnoses (approximately 11%).[2,6] This breakdown has some face validity to practicing emergency physicians, for whom general medical conditions outnumber vestibular and neurologic diagnoses in real-life practice.

Studies done on large administrative databases have the limitation that the accuracy of the charted diagnosis is unknown. In the NHAMCS study, 22% of patients received a symptom-only diagnosis (eg, dizziness, not otherwise specified). Although assigning a diagnosis of the presenting symptom is not uncommon in emergency medicine practice, a symptom-only diagnosis was almost 2 times more common in dizzy patients than in all other patients (22.1% vs 8.4%, odds ratio [OR] = 3.1, $P<.001$). In addition, even if a specific vestibular diagnosis is made, such as BPPV or an acute peripheral vestibulopathy, use of imaging and treatment with medications is not in accordance with best evidence.[7]

In the NHAMCS study, prospectively defined “dangerous” diagnoses (various cardiovascular, cerebrovascular, toxic, metabolic and infectious conditions in which the possibility of a poor outcome without treatment was likely) were found in 15% of patients and the proportion increased with age (21% dangerous diagnoses in patients >50 years vs 9.35 in patients $\leq$50, $P<.001$).[2] Among 15 dangerous causes analyzed, the most commonly recorded were fluid and electrolyte disturbances (5.6%), cerebrovascular diseases (4.0%), cardiac arrhythmias (3.2%), acute coronary syndromes (1.7%), anemia (1.6%), and hypoglycemia (1.4%).[2] Some dangerous causes of dizziness, such as adrenal insufficiency,[8] aortic dissection,[9] carbon monoxide intoxication,[10] pulmonary embolus,[11] and thiamine deficiency,[12] are treatable causes that are important but rare.[2]

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