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Striking the Right Balance: Vestibular Case History

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Sonay Cheema, M.Sc., RAUD

In this edition of "Striking the Right Balance," Sonay Cheema, M.Sc., RAUD looks at the benefits and drawbacks of a comprehensive vestibular case history for dizzy patients.

Michael Vekasi, AuD, R.Aud, Aud(C), FAAA coordinates the "Striking the Right Balance," feature which will cover the latest information on 'all things vestibular.' If you would like to be more involved in all things vestibular, please check out and like our Facebook page by searching for "CAA National Vestibular Special Interest Group" within Facebook. You can also reach us by email at CAAvestibular@gmail.com.

Introduction

A complete history is crucial to the diagnosis and management of the dizzy patient. Diagnostic vestibular tests quantify function within the system, which is sometimes helpful for a differential diagnosis; however, an accurate diagnosis can often be made from the history...if the appropriate questions are asked and time is taken to understand the patient's true experience.[1]

Ascertaining a vestibular diagnosis is a complex endeavour. I believe this is because the vestibular system is itself complex! Balance and spatial orientation involve not one but three vital systems:

- Vestibular: comprised of five 'motion detectors' in each ear; three are semicircular canals, which detect rotational movements, while the remaining two otolithic organs detect linear accelerations and gravity
- Visual: informs spatial positioning
- Proprioceptive: informs body movement from muscle and joint feedback

Neural signals from all three systems combine in the brainstem and integrate with information from the cerebellum and cerebral cortex. The brain dispatches the interpreted information back to the body and eyes to enable comprehensive balance control. Any disruption in the brain can have devastating functional impacts on a person's daily life. Balance & Dizziness Canada[2] defines the overarching disruptions as dizziness. The Bárány Society's Classification of Vestibular Symptoms[3] further defines symptoms as shown in the diagram below:

Figure 1. Vestibular symptoms.[3,4]

Renowned vestibular audiologist Erica Zaia has likened clinicians to detectives when figuring out vestibular disorders. As any good detective knows, a vital part of an investigation is taking personal accounts of the crime or, in this case, the dizziness episode(s). A thorough case history included in the vestibular test battery will greatly help the patient's assessment, diagnosis, and treatment.

Benefits

Differentiating disorders from overlapping symptoms

…the diagnosis of [Meniere's disease (MD)] relies on the accurate and detailed taking of medical history, and the differentiation between MD and vestibular migraine (VM) is of critical importance from the perspective of the treatment efficacy.[5]

Case Study: male, 33, referral: query Meniere's disease

This patient who described symptoms of nausea, head pressure, vertigo, and tinnitus lasting a few hours. A thorough case history revealed his sister, mother, and maternal aunt suffered from migraine attacks with symptoms different than his own. In addition to his assessment results (all within normal limits), I highlighted this family history in his report. The patient later reached out to let me know that he was undergoing treatment for vestibular migraine (not Meniere's disease, as the referring physician originally suspected), which had successfully alleviated most of his symptoms. He had no idea that he had migraines, or that they can manifest with differing

symptoms than his family members.

Case Study: male, 57, referral: no benefit from vestibular neuritis treatment, r/o other vestibular factors

This patient presented with symptoms of blurred vision, imbalance, nausea, and tinnitus lasting days. He was prescribed medications for vestibular neuritis, but the patient's symptoms did not cease. After taking a thorough case history, including questions about exposure to workplace vestibulotoxic substances, it was revealed that the patient had been exposed to the solvent Styrene while working in the automotive industry. With his physician's help, his workplace agreed to limit this exposure for all employees. He found benefit from vestibular rehabilitation therapy as the damage was, thankfully, not severe.

Detecting co-occurring disorders

A systematic approach to history-taking can identify multiple co-occurring vestibular disorders, which is essential for formulating a comprehensive diagnosis and management plan.[6]

Case Study: female, 45, referral: query SCD

This patient suffered from vertigo, right-sided hearing loss, autophony, and imbalance and unsteadiness. Upon further prompting, she described intense room-spinning lasting several hours, accompanied by vomiting. Her assessment results were positive for right-sided SCD, while she also had abnormal caloric responses (unilateral weakness). The patient's results as well as case history helped her physician diagnose and treat both SCD and vestibular neuritis.

Detecting co-morbidities

Accompanying symptoms also help to orient to the underlying cause, like aural or neurologic symptoms, but also chest pain or dyspnea[7]

A thorough case-history can aid a clinician in determining if a patient can safely undergo each assessment, if their medical status will impact test results, and if their symptoms may indicate a non-vestibular-related event.

Case Study: male, 72, referral: c/o dizziness for the past 6 months

This patient presented with room-spinning, light-headedness, nausea, and blurred vision lasting a few minutes. His objective vestibular assessment results indicated BPPV. However, during the case history he revealed he was under a great deal of stress at work and had to stand for long periods. His symptoms occurred after sitting up, tipping his head up, and laying down, though they could also happen while he was standing for hours, and would resolve when he sat down. With this information, his physician uncovered and addressed orthostatic hypotension in addition to BPPV.

Choosing relevant assessments

A thorough case history is key to determining appropriate assessments. For example, a study by El-Anwar and colleagues[8] highlighted the necessity of performing appropriate provocation tests when a patient's history indicates BPPV.

Case Study: female, 39, referral: query SCD

This patient's physician requested an ABR, though the patient had an MRI about a month before the appointment that showed no pathology. At the time of this writing, an MRI is the gold standard test for determining if a retrocochlear pathology is present. As the patient revealed symptoms that were indicative of SCD, I believed VEMPs were important to conduct. However, the amount of noise exposure for VEMPs and ABR testing combined is a great deal for a person to undergo in one day. I made the informed clinical decision to administer only one 'noisy' test, the more applicable VEMPs assessment, and keep the patient safe.

Fostering trust

...fear ratings were significantly correlated with the maximum slow-phase velocity (SPV) of nystagmus induced by caloric testing. These combined results indicate that anxiety may influence the gain of the VOR[9]

I have found that listening to patients tell their story during history-taking can put them more at ease and foster a sense of safety before the difficult vestibular assessments. Essentially, the calmer a patient can be, their results will likely be more reliable.

Aiding in treatment

The patients were referred to the [vestibular rehabilitation] program…after careful collection of history…we observed that in some cases, even in patients with diagnostic hypothesis and similar vestibular exam, different number of sessions and types of protocols were required. It showed us the importance of a personalized rehabilitation program that respects the lesion site and patients' complaints, difficulties, and skills.[10]

Case Study: female, 28, referral: r/o peripheral vestibular dysfunction

As this patient suffered from photophobia and migraines, I gave her a handout during her case history appointment, which included information on modifications to diet and lifestyle as well as natural remedies and medications from an established ENT. Before her assessment appointment, she called to postpone her tests while she tried the prescribed modifications approved by her GP. She later reported back that all she did was adjust her diet, which resulted in a significant reduction of her migraines and her dizziness resolved.

Knowledge of prior treatments, including outcomes, can offer further understanding of the patient's needs. A 2004 study by Rupa[11] proved this:

...of 90 [BPPV] patients who underwent the Epley maneuver, 7 (8%) did not achieve complete relief of symptoms after 2 weeks…two patients were discovered to have horizontal semicircular canal BPPV and underwent a specific [particle repositioning maneuver, PRM] to which they responded. Of the 5 remaining patients, 2 developed persistent nonpositional episodic vertigo with associated aural fullness and tinnitus, which suggested a diagnosis of Ménière's disease…the patient was given 16 mg of betahistine hydrochloride 3 times daily and experienced relief. Two other patients had persistent BPPV of the posterior semicircular canal with no associated condition except for cervical spondylosis. Of these patients, 1 responded to 3 months of home-based vestibular habituation therapy…while the other refused further treatment. The remaining patient, who presented 3 times to the outpatient services with acute positional vertigo and experienced partial relief with PRM at each visit, was found on computed tomographic scanning to have a 2 × 3-cm mass in the right posterior fossa, which was later found to be a meningioma.

Facilitating individualized counselling

Vestibular disorders cause functional limitations or decreased ability to perform activities of daily living independently.[12]

History-taking can give insight into how a person's quality of life is affected at home, work, and social situations. This information can help counsel and inform a personalized management plan, which will more likely directly improve the patient's day-to-day function.

Taking a suggestion from a well-established vestibular audiologist in the community, I now ask overwhelmed patients to name the top two functional impacts affecting them the most. One patient narrowed down their top two most bothersome real-world consequences as "not being able to turn their head side to side or look up" and "being afraid to walk by themselves." My counselling strategy focussed on addressing these two areas first. This can motivate patients to stick with a rehabilitative program, alleviate the disorder's main burden on the patient's day-to-day function, and foster hopefulness in their recovery.

The case history can also serve as an outcome measure tool for the patient's future specialists. It may even give practitioners enough information to forgo repeated history-taking, saving the patient time and energy.

Drawbacks

Cognitive issues

...[a] structured written questionnaire serves to obtain a thorough history, and a systematically designed survey may also prove to be a powerful tool for predicting diagnoses...a complete review of the patient's answers will allow the interviewer to direct the conversation toward relevant aspects of the questionnaire and better focus the specialist's evaluation. It is also important to clarify any questions that the patient may have found confusing, as a lack of understanding of the questions may affect the physician's review of the form.[1]

An appropriate questionnaire completed in advance can help patients, especially those with

cognitive issues, who will have more time to think about their answers and obtain assistance. It can also be helpful for family members or close friends to be present during history-taking to fill in any gaps and ensure all consent is informed.

In my experience, key components of a good case history should include the following:

- Symptoms: characteristic of the sensation (differentiate between spinning vs. imbalance vs. light-headedness – if spinning is involved, further differentiate between room-spinning and spinning in one's own head), how intensely these symptoms are felt, onset, duration, associated symptoms (e.g., hearing loss, ear pressure, headaches, etc.), frequency, exacerbating factors, inhibiting factors, triggers, warning signs
- Medical history: co-morbid conditions (e.g., anxiety, depression, cardiovascular and metabolic disorders, etc), head trauma, surgeries, migraines, MVAs, neck or back functional issues
- Medications: long-term/regular use, any started around onset of dizziness, taken on the day of testing
- Quality of life impact: activities of daily living, occupational responsibilities, social interactions
- Lifestyle/environmental factors: alcohol consumption, smoking, stress, head injuries, vestibulotoxic chemical exposure, etc.
- Audiological information
- Prior assessments and/or treatments: vestibular physiotherapy, medications, MRI, CT, etc
- Family history

Time-consuming

History taking is a crucial aspect of the diagnostic process. Investing time here might save time in the end, since it [can help] to establish the right (differential) diagnosis from the beginning of the process[6]

The questionnaire I am using in clinic is brief and aims to cover as much information as possible while attempting to minimize patient fatigue and stress. During my discussion with each patient, I delve deeper into areas relevant to the patient's experience.

Vancouver General Hospital has successfully piloted a virtual health program to encourage further efficiency, where vestibular case histories are conducted over Zoom before assessments. Structured questionnaires are sent to patients ahead of their Zoom appointments and are discussed during the call. So far, these appointments have saved time for both the patient and clinic. Patients also report a reduction in anxiety by the time I see them in-person. They are more informed about the tests, why they are needed, and what they need to do to prepare for them, which allows us to get through testing much quicker. I am also better able to prepare for their in-person appointments. Another upside is that the number of no-show appointments have reduced. We still allow patients to conduct the case history in-person on the day of their testing, though most patients opt for Zoom

calls to shorten time spent at the hospital.

Misdiagnosing

As prominent audiologist, Carolyn Falls, discussed in a previous article,[13] vestibular audiologists in Canada are tasked to assess patients and provide as much information to referring physicians as possible, without diagnosing. However, having an idea of a possible diagnosis is extremely helpful, especially regarding planning the test battery, making informed recommendations, and providing relevant counselling. It is important to note that relying solely on a case history without proper objective assessments is imprudent. I have had instances where patients reported no spinning sensation yet have had a significant unilateral weakness during a caloric assessment. A lack of vertiginous symptoms does not rule out true vertigo. An ultimate diagnosis should include the case history/patient experience and objective assessment results; the more information available will help with a more accurate diagnosis and better patient care.

Conclusion

There are many reasons to take a thorough history and, in my opinion, very little reason not to. The benefits of history-taking clearly outweigh the drawbacks. An apt illustration of this is the case of a 47-year-old patient with very little referral information; during her assessment I had found absent contralateral reflexes, delayed P1 cVEMP latencies bilaterally, down-beating spontaneous nystagmus during VNG, asymmetrical eye movement during pendular pursuit testing – indications of a central component. I would have been concerned about the central signs if I had not taken a proper case history. As it was, this patient revealed that she was diagnosed with Multiple Sclerosis and had ischemic optic neuropathy.

This patient, who was new to the country and our medical system, did not seem to think her diagnosis was important information to proffer without some digging on my part. As such, I wondered if there was a chance something like this could be missed during history-taking with a physician. In fact, as Jacobson and Shepard state, “some patients may have not yet discussed their symptoms in depth with any other specialist or health care worker.”[1]

Our medical system is far from perfect as some things can find a way of slipping through the cracks. To better prevent this and for the reasons explained in this article, I believe taking a proper case history is best practice and contributes greatly towards comprehensive patient care.

*Please note, details in case studies have been altered to protect the identity of the individuals involved

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