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DIFFERENTIATION BETWEEN VESTIBULAR MIGRAINE AND OTHER CAUSES OF RECURRENT VERTIGO: A LITERATURE REVIEW

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ABSTRACT

Introduction: *recurrent vertigo is a common clinical challenge due to overlapping symptoms among vestibular disorders such as vestibular migraine, Ménière's disease, BPPV, PPPD, and RVS-NOS. Accurate differentiation is essential to guide diagnosis, management, and improve patient outcomes.*

Objective: *to summarize the key clinical features, diagnostic criteria, and differential characteristics that allow clinicians to distinguish vestibular migraine from other common causes of recurrent vertigo, including Ménière's disease, BPPV, PPPD, and RVS-NOS.*

Methods: *a narrative review was conducted using PubMed and Web of Science (2000–2025), focusing on clinical features and diagnostic criteria of vestibular migraine, Ménière's disease, BPPV, PPPD, and RVS-NOS. Relevant peer-reviewed articles, consensus documents, and guidelines in English or Spanish were included.*

Resultados: *the analysis highlights significant clinical overlap among vestibular disorders, with distinct diagnostic criteria essential to differentiate conditions such as VM, MD, BPPV, PPPD, and RVS-NOS. Standardized evaluations and targeted diagnostic tools remain crucial for accuracy.*

Conclusiones: *accurate differentiation of vestibular disorders requires standardized criteria and advanced diagnostic approaches. Multidisciplinary strategies and future research on biomarkers will be key to improving patient outcomes.*

KEYWORDS: *Vestibular migraine; Ménière's disease; BPPV; PPPD; Recurrent vertigo.*

INTRODUCTION

Recurrent vertigo represents a frequent clinical challenge due to the wide range of possible etiologies and the overlapping symptoms among different vestibular disorders. The most relevant causes include vestibular migraine (VM), Ménière's disease (MD), benign paroxysmal positional vertigo (BPPV), persistent postural-perceptual dizziness (PPPD), and recurrent vestibular symptoms not otherwise specified (RVS-NOS). These conditions share clinical features such as recurrent vertigo episodes, imbalance, intolerance to visual or auditory stimuli, and even neurovegetative symptoms, which complicates the precise identification of the underlying disorder(1-5).

In recent years, the standardization of diagnostic criteria, such as those proposed by the Bárány Society and the International Classification of Headache Disorders, has improved the characterization of VM, MD, BPPV, and PPPD. However, a significant group of patients present recurrent vestibular symptoms that do not fully meet established criteria, leading to the definition of the RVS-NOS category as a diagnostic gap requiring further investigation(1-4) .

Proper differentiation among these entities is essential not only to establish an accurate diagnosis but also to guide the most appropriate treatment, prevent misdiagnosis, and improve the quality of life of patients living with chronic vertigo. Moreover, an accurate clinical approach can help reduce the economic and social burden associated with these disorders, which represent a frequent cause of consultation in primary care as well as specialized otolaryngology and neurology services.

METHODS

This narrative review was conducted through a structured literature search in PubMed and Web of Science, focusing on publications between 2000 and 2025. The search strategy

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included terms such as "vestibular migraine," "Ménière's disease," "BPPV," "persistent postural-perceptual dizziness," and "recurrent vestibular symptoms." Only articles in English or Spanish were considered. Priority was given to consensus documents, diagnostic criteria updates, clinical guidelines, and peer-reviewed original or review articles relevant to the differential diagnosis of recurrent vertigo (1–5).

Data were extracted regarding clinical presentation, episode duration, triggers, associated symptoms, diagnostic tests, and proposed management strategies. The information was synthesized to create a comparative framework highlighting the distinguishing features of each disorder.

DEVELOPMENT

Vestibular Migraine (VM)

Vestibular migraine is a neurological disorder characterized by recurrent episodes of vertigo associated with typical migraine symptoms, such as photophobia, phonophobia, nausea, and headache. Although the exact pathophysiology is not fully understood, it has been suggested that VM may involve neuroanatomical pathways connecting central vestibular structures with brainstem nuclei, such as the locus coeruleus and raphe nuclei, which modulate vestibular and sensory activity(6).

Ménière's Disease (MD)

Ménière's disease is an inner ear disorder characterized by recurrent episodes of vertigo, fluctuating hearing loss, tinnitus, and aural fullness. The pathogenesis is thought to involve abnormal accumulation of endolymph in the membranous labyrinth, known as endolymphatic hydrops, which can impair vestibular and auditory function, contributing to the disease's characteristic symptoms(7).

Benign Paroxysmal Positional Vertigo (BPPV)

BPPV is one of the most common causes of peripheral vertigo and is characterized by brief, recurrent episodes of vertigo triggered by specific head movements. The underlying cause is the presence of free otoliths in the semicircular canals of the inner ear, leading to inappropriate stimulation of hair cells and the sensation of vertigo(8).

Persistent Postural-Perceptual Dizziness (PPPD)

PPPD is a chronic functional vestibular disorder characterized by non-rotatory dizziness, postural instability, and heightened sensitivity to visual or motion stimuli. Symptoms are often exacerbated by upright posture and movement and may be triggered following events that disrupt balance, such as peripheral vertigo or psychological stress. Diagnosis relies on clinical criteria established by the Bárány Society, which include the presence of symptoms for most of the day for at least three months, worsening with upright posture or complex visual environments, and absence of another underlying cause(9).

Recurrent Vestibular Symptoms Not Otherwise Specified (RVS-NOS)

RVS-NOS is characterized by recurrent episodes of vertigo without an identifiable cause that meets the diagnostic criteria of other vestibular disorders. Episodes can last from minutes to several hours and are often accompanied by vegetative symptoms such as nausea and vomiting. Although patients with RVS-NOS do not meet the criteria for vestibular migraine or Ménière's disease, their clinical presentation may resemble these conditions. Symptoms tend to remain stable over time, and although the diagnosis can be challenging due to the lack of clear distinctive features, the clinical course is generally favorable(10).

Table 1. Differential diagnosis of recurrent vertigo.

Disorder	Typical duration of episodes	Triggers/Pattern	Auditory symptoms	Key clues vs. Vestibular Migraine
Vestibular Migraine (VM)	5 min – 72 h	Spontaneous, head motion, visual stimuli; history of migraine/migrainous features	Usually absent; may have transient fullness or tinnitus	Temporal association with migraine symptoms; Bárány/ICHD-3 criteria essential.
Ménière's Disease (MD)	20 min – 12 h	Spontaneous, often in clusters	Fluctuating low–mid frequency sensorineural hearing loss with ipsilateral tinnitus/fullness	Documented and progressive hearing loss; more 'aural' presentation than VM.
Benign Paroxysmal Positional Vertigo (BPPV)	Seconds (<1 min) per attack	Positional (Dix–Hallpike/Roll test); fatigable	None	Typical positional nystagmus; resolves with repositioning maneuvers; migraine features not required.
Persistent Postural-Perceptual Dizziness (PPPD)	Chronic (≥3 months, fluctuating daily)	Worse with upright posture, movement, complex visual environments	None	Not episodic vertigo; often triggered by a prior vestibular disorder (including VM/MD/BPPV).
Recurrent Vestibular Symptoms NOS (RVS-NOS) / Benign Recurrent Vertigo (BRV)	Variable, usually mild	Recurrent episodes without fulfilling VM or MD criteria	Occasional mild auditory complaints	'Wastebasket' category; may overlap with migraine spectrum; requires follow-up.

Source: Created by the authors, based on Lempert et al. (2021) (1), López-Escámez et al. (2015) (2), Bhattacharyya et al. (2017) (3), Staab et al. (2017) (4), Eggers et al. (2021) (5).

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RESULTS

The literature review indicates that each recurrent vestibular condition presents distinct clinical and diagnostic characteristics that allow differentiation. Vestibular migraine is characterized by recurrent vertigo associated with typical migraine symptoms, whereas Ménière's disease is identified by the combination of vertigo, fluctuating hearing loss, and tinnitus. BPPV manifests as brief vertigo episodes induced by head movements, confirmed through positional maneuvers and observation of nystagmus. PPPD is defined by chronic non-rotatory dizziness, postural instability, and heightened sensitivity to visual or motion stimuli. RVS-NOS includes recurrent vertigo episodes without an identifiable cause, with diagnosis primarily made by exclusion. Collectively, these findings emphasize the relevance of a detailed clinical evaluation and the application of specific diagnostic criteria to establish an accurate diagnosis and guide effective therapeutic strategies.

DISCUSSION

The clinical differentiation between vestibular migraine (VM), Ménière's disease (MD), benign paroxysmal positional vertigo (BPPV), persistent postural-perceptual dizziness (PPPD), and recurrent vestibular symptoms not otherwise specified (RVS-NOS) remains a diagnostic challenge due to symptom overlap and variability in clinical presentation. VM is characterized by recurrent episodes of vertigo or vestibular symptoms associated with migraine, with or without headache, and may present with fatigable positional nystagmus, although this is not exclusive to VM. MD is distinguished by spontaneous episodes of vertigo lasting 20 minutes to 12 hours, fluctuating hearing loss, and aural symptoms such as tinnitus and a sense of fullness, without an alternative vestibular cause. BPPV is identified by vertigo induced by specific changes in head position, with characteristic positional nystagmus observed during diagnostic maneuvers such as the Dix-Hallpike test. PPPD is defined by chronic non-rotatory dizziness, postural instability, and heightened sensitivity to visual or motion stimuli, with symptoms present on most days for at least three months. RVS-NOS comprises recurrent episodes of vertigo without an identifiable cause, with a clinical presentation more similar to VM than MD and a diagnosis primarily made by exclusion. These findings underscore the importance of a detailed clinical evaluation, the application of standardized diagnostic criteria, and the use of specific diagnostic tools to avoid misdiagnosis and guide appropriate treatment(7-12).

Clinical Implications

The accurate differentiation of recurrent vestibular disorders has direct implications for patient care and treatment selection. Misdiagnosis can lead to ineffective interventions, unnecessary medication use, or delayed therapy, ultimately prolonging patient suffering and increasing healthcare costs. For example, distinguishing vestibular migraine from Ménière's disease is essential, as the former often responds to migraine-directed pharmacological and lifestyle interventions, whereas the latter may require dietary modifications, vestibular suppressants, or intratympanic therapy. Similarly, early recognition of BPPV allows for rapid resolution of symptoms through canalith repositioning maneuvers, while misclassification as PPPD could result in prolonged functional impairment. Therefore, comprehensive evaluation not only enhances diagnostic precision but also optimizes clinical outcomes and patient quality of life.

Future Directions

Ongoing research aims to refine diagnostic criteria and identify biomarkers that may help reduce the diagnostic uncertainty among overlapping vestibular conditions. Advances in neuroimaging, audiovestibular testing, and genetic profiling are emerging as promising tools to improve differentiation, particularly between VM and RVS-NOS, where clinical boundaries remain blurred. Moreover, the integration of digital health technologies, such as mobile tracking of vertigo episodes and virtual reality-based vestibular rehabilitation, may expand the therapeutic options available for these patients. Future studies should also explore the psychosocial burden of chronic vestibular disorders, as comorbid anxiety and depression are common and can significantly influence prognosis. These directions highlight the need for a multidisciplinary approach combining neurology, otology, psychology, and rehabilitation sciences to improve both diagnostic accuracy and long-term management strategies.

Clinical Relevance

Early identification and precise differentiation of recurrent vestibular disorders have a direct impact on clinical practice and public health. Accurate diagnosis enables the implementation of cost-effective interventions, such as repositioning maneuvers for BPPV or therapies targeted at vestibular migraine, avoiding unnecessary or inappropriate pharmacological treatments. Moreover, it reduces the economic burden on healthcare systems by minimizing repeated consultations, hospitalizations, and redundant diagnostic tests. Finally, it improves patient quality of life by shortening the time to symptom relief and optimizing the comprehensive management of these complex conditions.

Limitations

This review has certain limitations that should be acknowledged. First, the available literature is highly heterogeneous in terms of study design, diagnostic criteria, and patient populations, which complicates direct comparison across studies. Second, most of the evidence is derived from observational or retrospective data, with limited randomized controlled trials to establish causality. Third, publication bias may have influenced the visibility of positive findings over negative or inconclusive results. Finally, the evolving nature of diagnostic criteria for vestibular disorders introduces potential variability in interpretation, highlighting the need for standardized and longitudinal studies.

CONCLUSIONS

The differentiation of vestibular disorders such as vestibular migraine, Ménière's disease, benign paroxysmal positional vertigo, persistent postural-perceptual dizziness, and recurrent vestibular symptoms not otherwise specified remains clinically challenging. Careful application of standardized diagnostic criteria, combined with advanced diagnostic tools, can improve accuracy and reduce misdiagnosis. Future research should

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focus on refining clinical criteria, validating biomarkers, and developing personalized treatment strategies to optimize patient outcomes. Ultimately, a multidisciplinary approach that integrates neurology, otology, and rehabilitation is essential for advancing the management of these complex vestibular conditions.

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Conflict of Interest Statement

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