



VESTIBULAR MIGRAINE

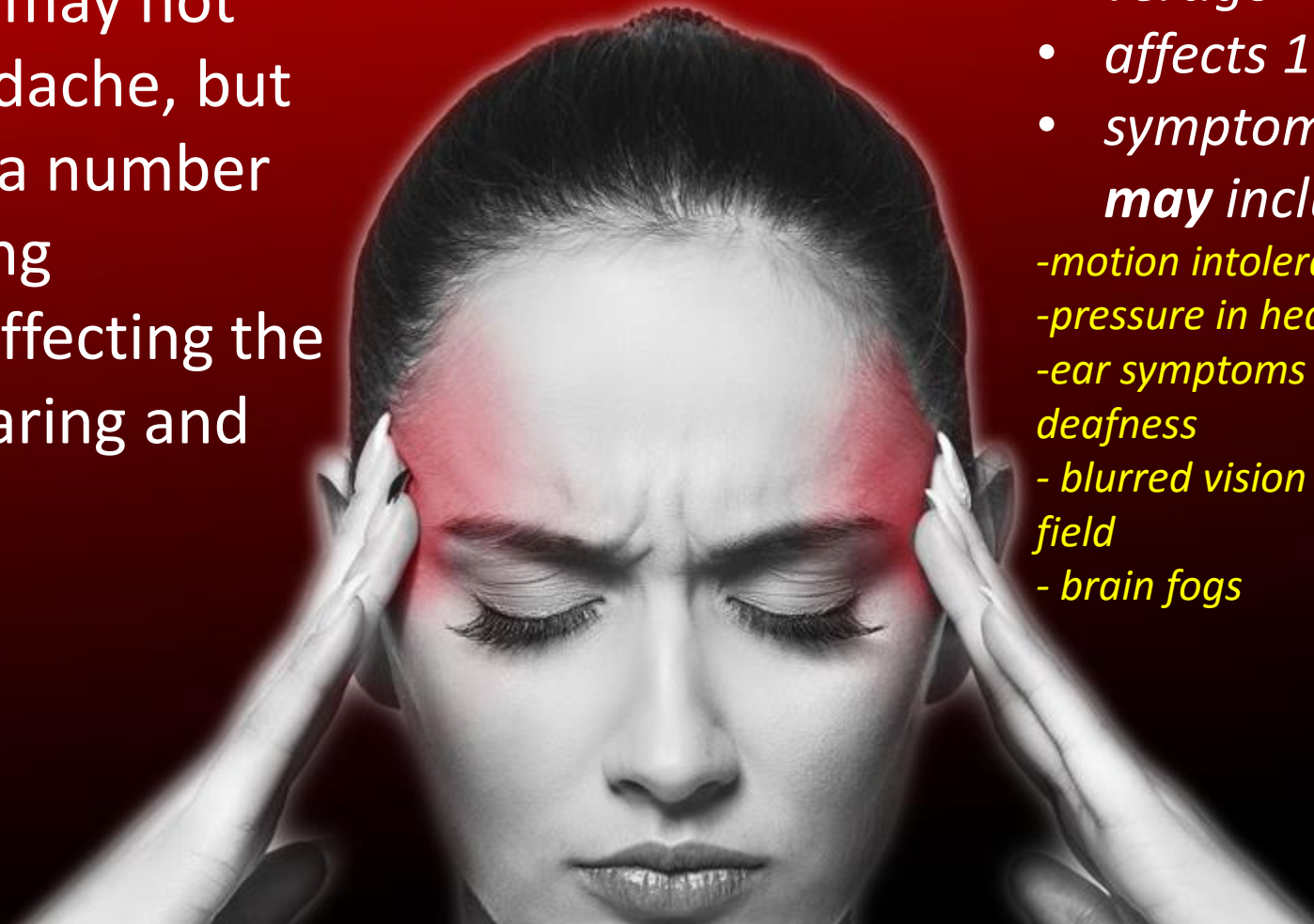
*diagnostic approach, differential diagnosis &
treatment*

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What is VESTIBULAR MIGRAINE ??

- *Def:* a type of migraine that may or may not cause a headache, but can include a number of debilitating symptoms affecting the balance, hearing and vision

- *second most common cause of vertigo*
- *affects 1% of population*
- *symptoms in addition to vertigo may include*
 - *motion intolerance*
 - *pressure in head / ears , headaches, neck pain*
 - *ear symptoms like tinnitus / low freq deafness*
 - *blurred vision / sparkles or blotches in visual field*
 - *brain fogs*

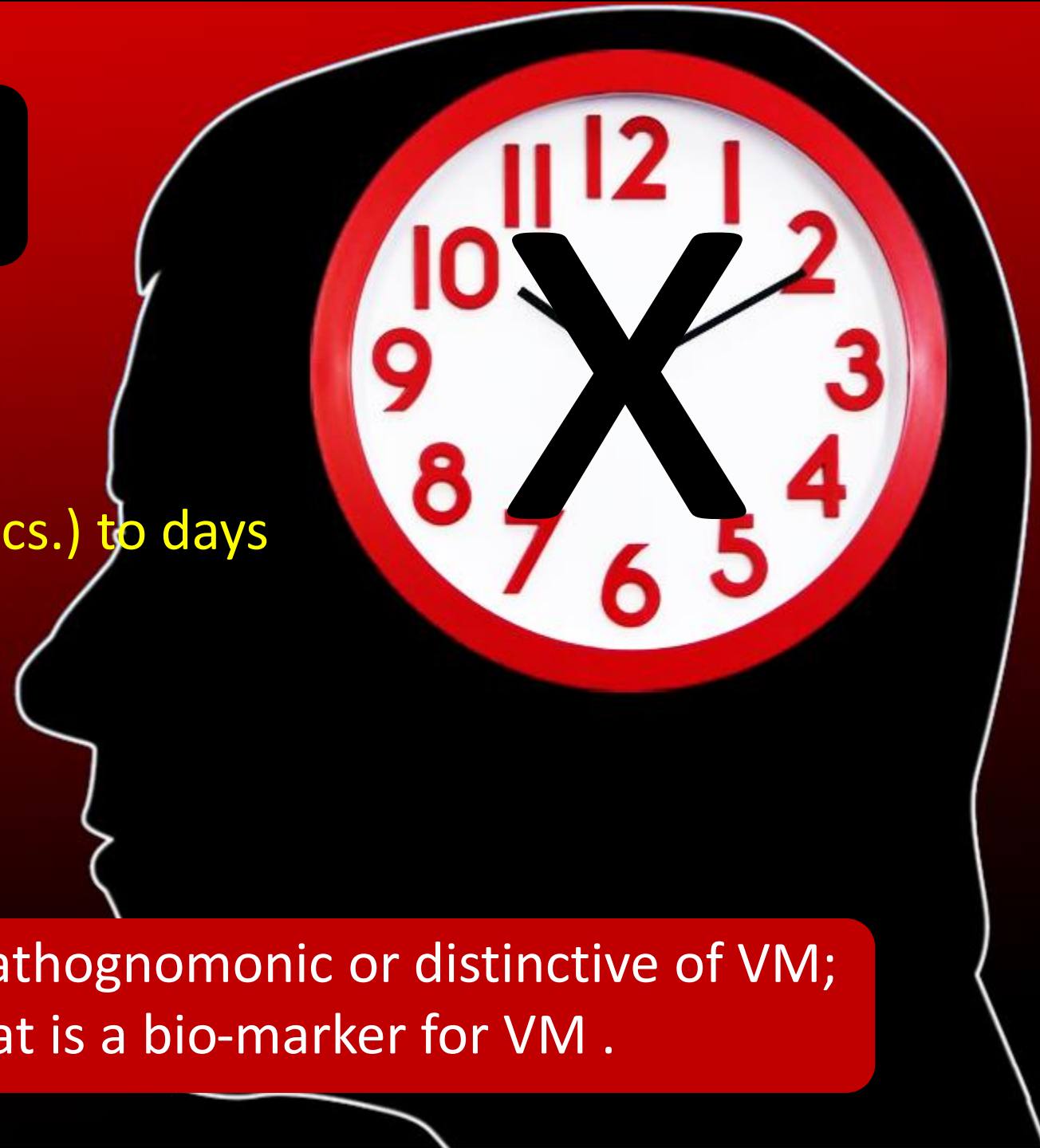


Vestibular Migraine (VM)

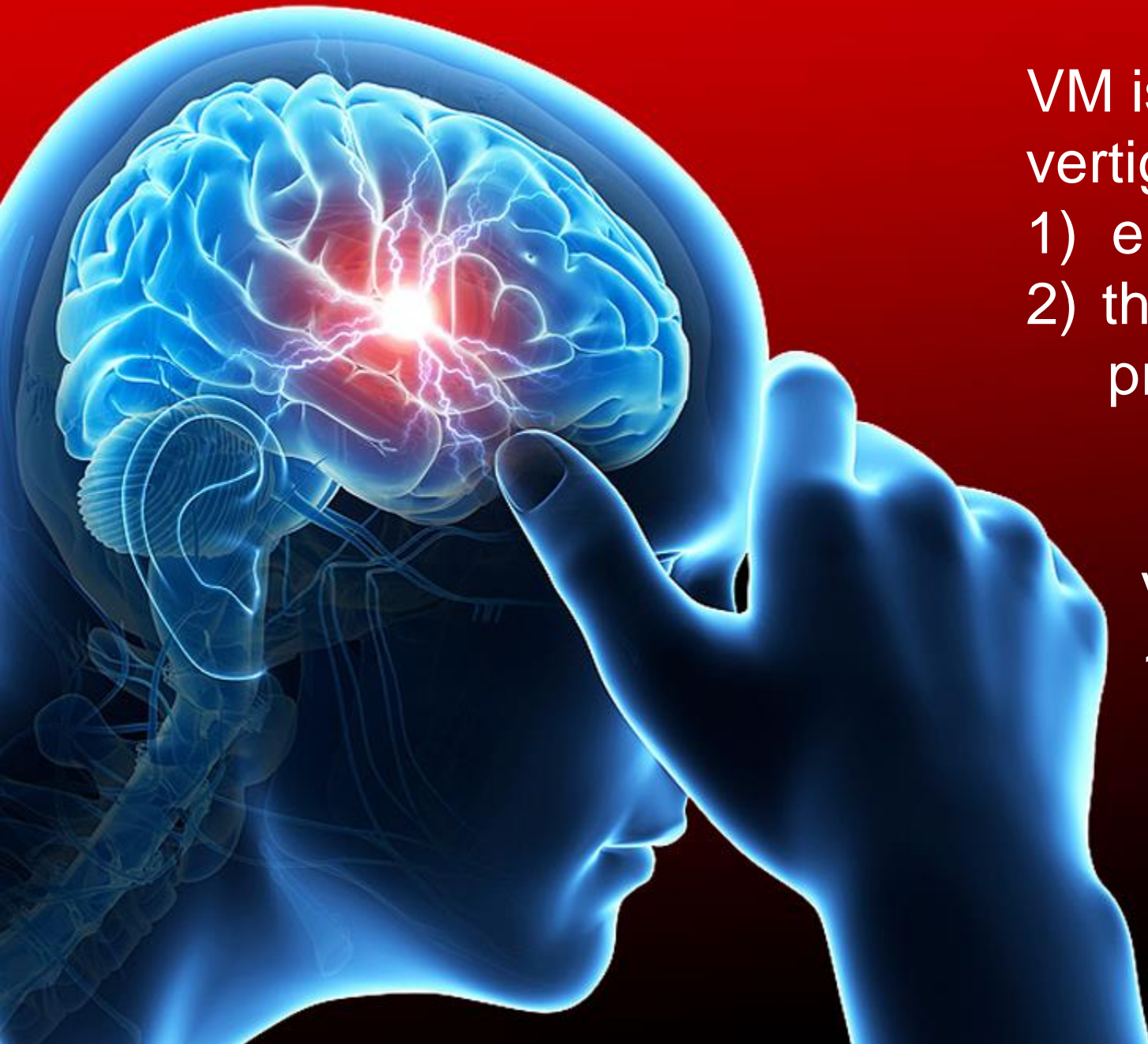
- a diagnostic challenge

- episodic spinning
- unsteadiness
- vertigo on change of head position
- visually induced vertigo

Duration-
mins (?secs.) to days



no typical sign / symptom that is pathognomonic or distinctive of VM;
no typical investigative findings that is a bio-marker for VM .



VM is a treatable common cause of vertigo that is diagnosed by:-

- 1) elimination of other conditions
- 2) therapeutic trial with Migraine prophylactic drugs

VM is **not** negated by:-

- 1) presence of ear problems
- 2) absence of headache

Epidemiology of Vestibular Migraine

- The prevalence of VM is reported in the range of 4.3-29.3%, while the prevalence of probable VM is 4-5.7% in ENT/Vertigo Clinics¹.
- The diagnosis rate of suspected VM made by referring physicians was 1.8%, whereas the actual VM diagnosis rate was 20.2% when the patients were seen in a tertiary vertigo center².
- VM is the most common cause of recurrent spontaneous vertigo attacks after benign paroxysmal positional vertigo (BPPV)³.

1. Behavioural Neurology Volume 2016, Article ID 1801845, 9 pages <http://dx.doi.org/10.1155/2016/1801845>

2. R. Geser and D. Straumann, "Referral and final diagnoses of patients assessed in an academic vertigo center," *Frontiers in Neurology*, vol.3, article169, 2012

3. H.K. Neuhauser, A. Radtke, M.von Brever n et al., *Neurology*, vol. 67, no.6, pp.1028-1033, 2006.

Clinical Features of vestibular migraine

- VM is 1.5-5 times more frequent in females than in males
- The mean age at first occurrence was 37.7 years for females and 42.4 years for males
- Migraine attacks (Headache) can be replaced by independent vertigo, dizziness, or a transient feeling of disequilibrium in elderly patients, especially postmenopausal women

1. M. Dieterich, M. Obermann, and N. Celebisoy, "Journal of Neurology, vol. 263, supplement 1, pp. S82-S89, 2016
2. Behavioural Neurology Volume 2016, Article ID 1801845, 9 pages <http://dx.doi.org/10.1155/2016/1801845>

Differential diagnosis of VM

- Meniere's Disease
- BPPV
- Episodic Ataxia type 2
- Mal de debarquement syndrome
- Transient Ischemia of the Vertebrobasilar Circulation

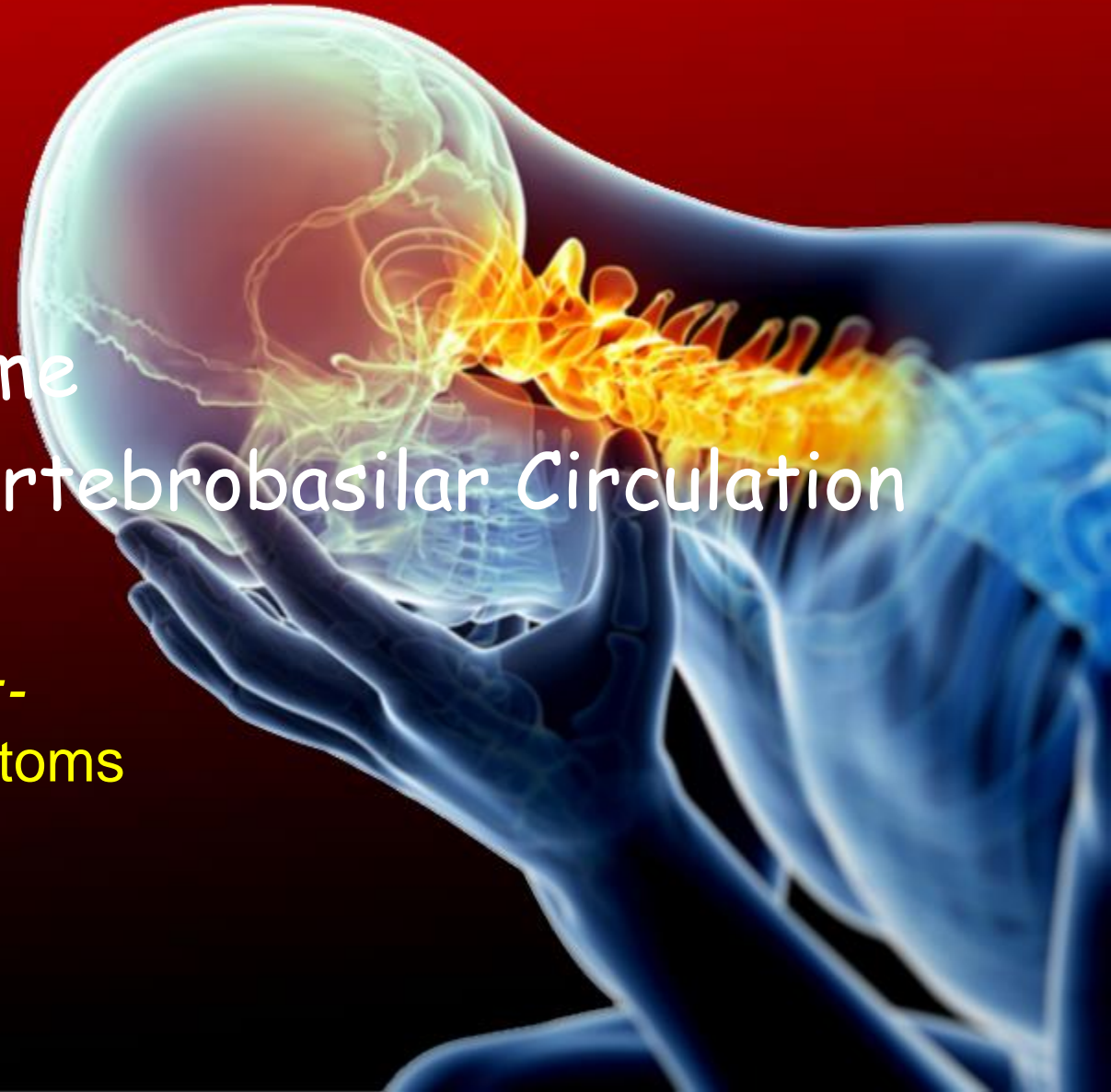
First attack of VM is indistinguishable from :-

First attack of MD without aural symptoms

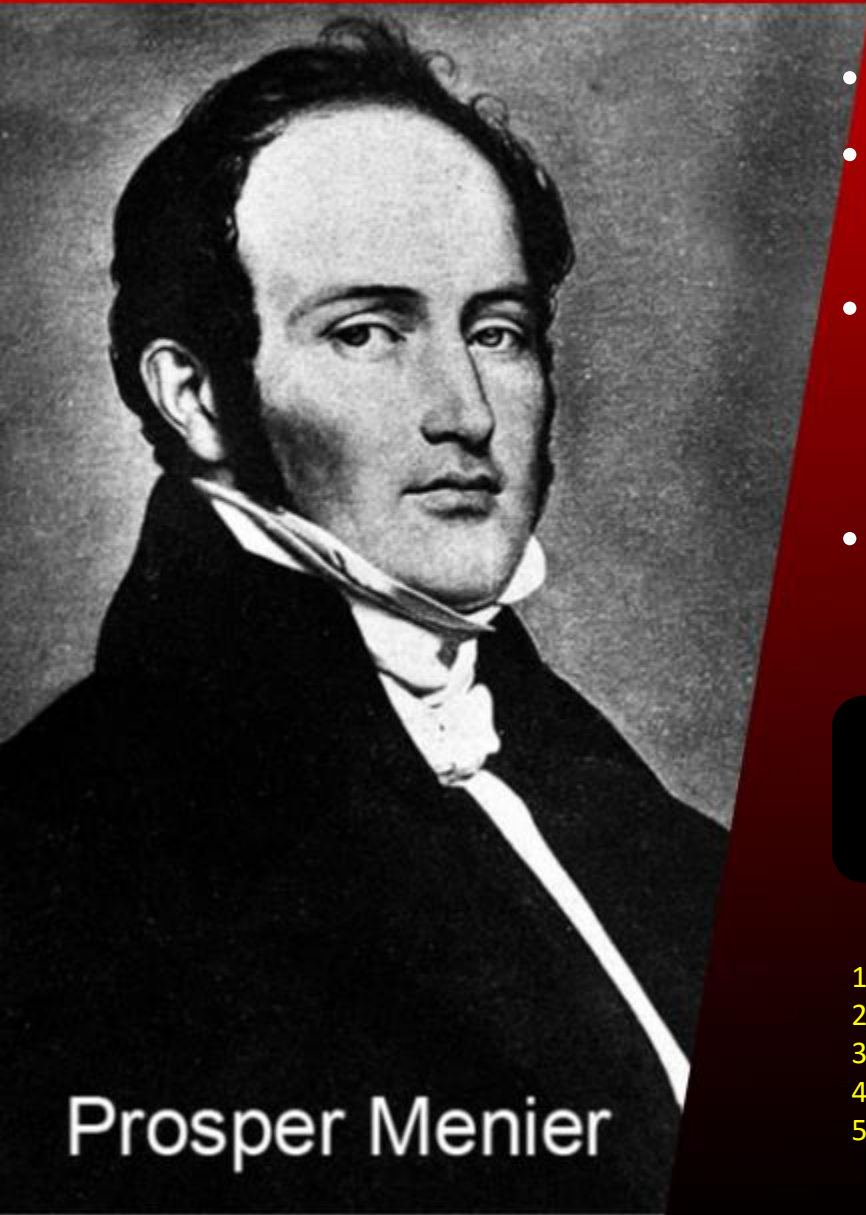
Vestibular neuritis

Labyrinthitis

Cerebellar stroke



Principal differential is with Ménière's Disease



Prosper Menier

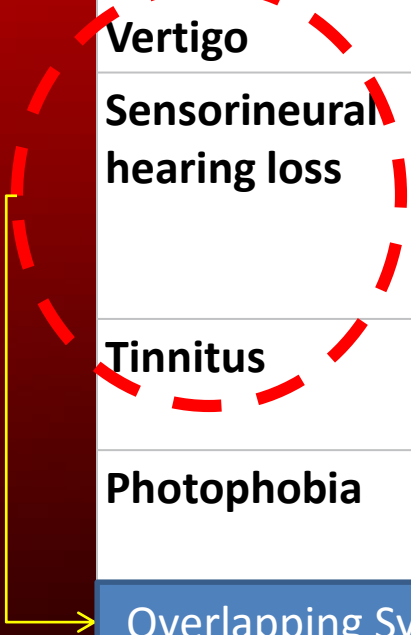
- In the early stages, differentiating the two can be very difficult
- Prosper Menière himself observed the association between MD and migraine
- Studies report higher prevalence of migraine in patients with MD, ranging from 43 to 56% (compared to 10% in the normal population)
- Interestingly, the reverse is also true: prevalence of MD among migraine patients is higher than in general population

Overlapping symptoms and epidemiologic association could indicate an underlying pathogenetic link between MD and MAV

1. Picture from: http://en.wikipedia.org/wiki/Prosper_M%C3%A9ni%C3%A8re
2. Teggi R et al. ACTA OTORHINOLARYNGOLOGICA ITALICA 2010;30:217-221
3. Rassekh CH, Harker LA. *The prevalence of migraine in Menière's disease*. Laryngoscope 1992;102:135-8.
4. Radtke A, Lempert T, Gresty MA, et al. *Migraine and Menière's disease*. Neurology 2002;59:1700-4.
5. Kayan A, Hood JD. *Neuro-otological manifestations of migraine*. Brain 1984;107:1123-42.

Both diagnoses rely on clinical history ; *no specific diagnostic test for VM*

Differentiating Features: Migraine-Associated Vertigo vs. Ménière Disease		
Symptom	Migraine-Associated Vertigo	Ménière Disease
Vertigo	May last >24h	Lasts up to 24h
Sensorineural hearing loss	Very uncommon; when present, often low frequency; very rarely progressive; may fluctuate in cases of basilar migraine	Nearly always, progressive; most often unilateral; may be bilateral; fluctuation is common
Tinnitus	May be unilateral or bilateral; rarely obtrusive	May be unilateral or bilateral; often of significant intensity
Photophobia	Often present; may or may not be associated with dizziness	Never present unless a concurrent history of migraine exists



Overlapping Symptoms

Careful history is very, very important

Some realizations in clinical practice & published literature – the MD–VM link

- Migraineurs have higher prevalence of vestibular symptoms than that of the general population
- More patients of MD have migraine than general population
- Studies have shown between 43% to 56% prevalence of migraine in MD patients whereas in normal population prevalence of migraine is 10%
- Higher prevalence of MD in a population screened for migraine than the general population

- Ref- 1. Kuritzky et al Headache M81:21: 227-231
2. Kayan et al 1984 Brain 107:1123-1142
3. Wedder-Cisneros et al Cephalalgia 2004:24:1031-44
4. Kayan et al Brain 1984;107:1123-42



DD between VM and MD

- Unilateral aural symptoms that aggravate during attacks more common in MD
- Duration of vertigo episode is between 20 minutes to 12hrs in MD; anything less or more than that very likely to be VM
- Investigations :- audiological - PTA, Glycerol test and ECoChG vestibulometry – VNG / VEMP / VHIT

VEMP to distinguish MD and VM



cVEMP @ 500Hz asymmetry more common in MD

click oVEMP & click cVEMP show more abnormalities in MD

cVEMP @ 500Hz amplitude ratio smaller in MD than in VM
cVEMP @ 1000Hz amplitude

Hearing is the most readily measured variable and the variable most related to the natural history of Menière's disease

1. Committee on Hearing and Equilibrium. *Guidelines for the diagnosis and evaluation of therapy in Menière's disease*. *Otolaryngol Head Neck Surg* 1995;113:181-5



DD between VM and BPPV

- Recurrent brief episodic vertigo triggered by head movements can be BPPV or VM
- BPPV is always very clear-cut position specific but VM is not so usually and occurs on all head positions
- Definite vertigo with typical nystagmus for each specific head position present in BPPV but in VM, pt. usually feels dizzy and typical transient severe vertigo with nystagmus is not there in VM
- Patients with subjective positional vertigo but without typical signs and specific head positions very likely to be VM and not BPPV

Associated Co-morbidities of Vestibular Migraine

- Anxiety & Depression
- Excessive Intake of Vestibular Suppressants
- Increased risk of Phobic Disorders



1. BMJ 2019;366:l4213 doi: 10.1136/bmj.l4213 (Published 3 July 2019)
2. FormeisterEJ, RizkHG, KohnMA, SharonJD. The epidemiology of vestibular migraine: a population-based survey study. Otol Neurotol 2018;39:1037-44. 10.1097/MAO.0000000000001900 30020261

Consensus criteria for Vestibular Migraine - ICHD-3 (IHS+BS)

Vestibular Migraine

- At least **5 episodes** with vestibular symptoms of moderate or severe intensity, lasting **5 min to 72 hours**
- Current or previous history of migraine with or without aura according to the International Classification of Headache Disorders (ICHD)
- One or more migraine features with at least 50% of the vestibular episodes:
 - headache with at least two of the following characteristics:
 - one sided location, pulsating quality
 - moderate or severe pain intensity, aggravation by routine physical activity
 - photophobia and phonophobia
 - visual aura
- Not better accounted for by another vestibular or ICHD diagnosis

Probable Vestibular Migraine

- At least 5 episodes with vestibular symptoms of moderate or severe intensity, lasting 5 min to 72 hours
- Only one of the criteria 2nd and 3rd for vestibular migraine is fulfilled (migraine history or migraine features during the episode)
- Not better accounted for by another vestibular or ICHD diagnosis

Table 2. Clinical characteristics of vertigo and concomitant symptoms in 61 patients with definite vestibular migraine.³⁶

	Initial presentation (%)	Follow up (%)
Type of vertigo		
Spontaneous	85	95
Spinning	75	82
Positional	39	80
Head-Motion-Induced	61	84
Unsteadiness	66	90
Duration of vertigo attacks		
< 1 min	31	75
1-5 min	30	56
5-60 min	34	64
< 24h	49	74
> 24h	52	69
Cochlear symptoms during vertigo spells		
Tinnitus	10	33
Aural fullness	13	26
Hearing loss	12	26
Migraine symptoms during vertigo attacks		
Headache	75	90
Photophobia	59	80
Phonophobia	54	77
Aura	18	44

1. Barbosa et al Arq Neuropsiquiatr 2016;74(5): 416-422

2. Radtke A, Brevern M, Neuhauser H, Hottenrott T, Lempert T. Vestibular migraine: long-term follow-up of clinical symptoms and vestibulo-cochlear findings. Neurology. 2012;79(15):1607-14. doi:10.1212/WNL.0b013e31826e264f

History - *Precipitating Factors*

- Headache,
- menstruation,
- irregular sleep,
- stress
- physical exertion
- dehydration,
- food and drinks
- intense sensory stimulation - *mostly movement/ bright light / loud sound*

1. Furman JM, Marcus DA, Balaban CD. Vestibular Migraine: clinical aspects and pathophysiology. *Lancet Neurol.* 2013;12(7):706-15. doi:10.1016/S1474-4422(13)70107-8
2. Barbosa et al *Arq Neuropsiquiatr* 2016;74(5): 416-422

Migraine Comorbid with Other Disorders causing Dizziness

- *Benign Paroxysmal Positional Vertigo*¹
- *Motion sickness*²
- *Orthostatic hypotension and syncope*³
- *Panic disorder*⁴
- *Depression*⁵
- *Anxiety*⁶

*Because of the frequent association of dizziness, migraine, and anxiety, a new syndrome named migraine-anxiety-related dizziness (MARD) has been proposed.*⁶

1. Ishiyama A, Jacobson KM, Baloh RW. Migraine and benign positional vertigo. *Ann Otol Rhinol Laryngol* 2000;109(4):377–380
2. JeongSH, OhSY, KimHJ, KooJW, KimJS. Vestibular dysfunction in migraine: effects of associated vertigo and motion sickness. *J Neurol* 2010;257(6):905–912
3. ThijsRD, KruitMC, van BuchemMA, FerrariMD, LaunerLJ, van Dijk JG. Syncope in migraine: the population-based CAMERA study. *Neurology* 2006;66(7):1034–1037
4. BreslauN, SchultzLR, StewartWF, LiptonRB, WelchKM. Headache types and panic disorder: directionality and specificity. *Neurology* 2001;56(3):350–354
5. BreslauNL, SchultzLR, StewartWF, LiptonRB, LuciaVC, WelchKM. Headache and major depression: is the association specific to migraine? *Neurology* 2000;54(2):308–313
6. Furman JM, Balaban CD, Jacob RG, Marcus DA. Migraine-anxiety related dizziness (MARD): a new disorder? *J Neurol Neurosurg Psychiatry* 2005;76(1):1–8

Relationship between Migraine and VM

- *is vertigo an aura of migraine??*

No!

1) attacks of vertigo in VM are not usually followed by headache - *inconsistent relationship*

2) duration of the vertigo is variable : minutes to days (*or seconds to days*)



Is this VM ? -when to suspect vest. migraine

- Vertigo attacks sometimes on change of position (but not consistently in any fixed head position) sometimes unprovoked, often once in a while, not every time
- Recurrent attacks of vertigo diagnosed elsewhere as MD but not a definite unilateral SN deafness & +/- aural symptoms not time locked with vertigo
- Brief recurrent single attacks of vertigo usually but not always on change of head posture that has not responded to liberatory manoeuvres
- Recurrent phases of non-spinning vertigo /unsteadiness but long symptom free periods

Is history of typical migraine headaches a must for the diagnosis of VM ??

No !!

- +ve history does not prove that the vertigo is VM
- -ve history does not rule out VM
- Headaches are often mild in VM that the patient ignores; *such headaches may not have typical migraine features*
- Visual aura without headaches are common in VM

Does the presence of aural symptoms or abnormalities in VFT negate the diagnosis of VM??

- There is evidence that migraine can damage the inner ear causing SN deafness as well as vestibular damage
- MD is believed to be caused by hypoxia of stria vascularis in the inner ear and migraine is known to induce vasospasm; hypoxia in inner ear in MD can be caused by migraine induced vasospasm
- Reports in literature of rotational vertigo with SN deafness and typical features of MD responding very well to migraine prophylactic therapy
- Cochlear symptoms during spells of vertigo are not uncommon in pts of VM and becomes more common as time passes and freq of attacks increase

1. Virre, Baloh ; Headache 1996;36:24-8
2. Lee, Lopez et al arch Neurol 2000;57:1631-4
3. Teggi et al Acta Otolaryngol. 2010;30:217-21
4. Radtke, Von Brevern, Neuheuser , Neurology 2102:79:1607-14

Investigations in vestibular migraine



- VM is basically a diagnosis of exclusion.
- No definite bio-marker in VFT that is pathognomonic of VM.
- VFT is usually normal but abnormal findings in some tests does not rule out VM.
- Non-specific findings like hyperactive caloric responses, abnormalities in oculomotor tests, non-specific white matter lesions in MRI neither confirm nor rule out VM

Management of vestibular migraine

- Communication -*reassurance and explanation*

- Lifestyle changes

- Drug therapy



For acute attack

For prophylaxis

Management of Vestibular Migraine

Treatment of Acute Attack

- Treat as Acute Vertigo
- Triptans

Prophylactic Treatment

- Non -Pharmacologic Treatment
- Pharmacotherapy
- Vestibular Rehab exercises

Acute Therapy for VM

- Zolmitriptan and Rizatriptan produced some reduction of vestibular symptoms in small randomised placebo-controlled studies.^{1,2}
- If nausea is present, antiemetics (such as prochlorperazine) can be used, albeit sparingly to avoid long term vestibular suppression.³

1. FurmanJM, MarcusDA, BalabanCD. Rizatriptan reduces vestibular-induced motion sickness in migraineurs. J Headache Pain 2011;12:81-8. 10.1007/s10194-010-0250-z 20862509

2. NeuhauserH, RadtkeA, von BrevernM, LempertT. Zolmitriptan for treatment of migrainous vertigo: a pilot randomized placebo-controlled trial. Neurology 2003;60:882-3. 10.1212/01.WNL.0000049476.40047.A3 12629256

3. BMJ 2019;366:l4213 doi: 10.1136/bmj.l4213 (Published 3 July 2019)

Overview of Prophylactic Management of Vestibular Migraine

Medication Options ^{20,21}	Physical Therapy	Additional Considerations
Betablockers - Propanolol - Metoprolol Anticonvulsants - Topiramate - Valproic acid - Lamotrigine Calcium Antagonist - Verapamil - Flunarizine - Lamotrigine Antidepressants - Venlafaxine - Amitriptyline - Nortriptyline Supplements - Magnesium Carbonic Anhydrase Inhibitors - Acetazolamide Other - Prophylaxis OnabotulinumtoxinA	Balance Gaze stability Oculomotor function Visual motion sensitivity	Diet - Reduce caffeine, alcohol - Avoid foods associated with symptom increase Sleep hygiene Trigger avoidance Anxiety / depression management Cognitive behaviour therapy Exercise / re-conditioning

Liu F, Ma T, Che X, Wang Q, Yu S. The efficacy of venlafaxine, flunarizine, and valporic acid in the prophylaxis of vestibular migraine. *Front Neurol* 2017;8:1–5.

Table 3. Prophylactic Agents for Vestibular Migraine [53,56,59,60,62,64,69,71,72]

Class	Examples of Drugs	Initial Dose	Target Dose	Adverse Effects
First- and Second-Line Agents				
Tricyclic antidepressants	Amitriptyline Nortriptyline	5–10 mg at night	Up to 100 mg at night	Drowsiness, constipation, dry mouth, nausea
Beta-blockers	Propranolol	10 mg bid	Up to 120 mg BD or 240 mg once daily SR	Bradycardia, lethargy, bronchospasm, dizziness, cold extremities, nightmares
	Metoprolol	25 mg bid	Up to 100 mg BD	
	Atenolol	12.5 mg daily	Up to 100 mg daily	
Calcium channel blockers	Flunarizine	2.5–5 mg daily	Up to 10 mg daily	Weight gain, somnolence, depression
	Verapamil	40 mg daily	Up to 320 mg daily in divided doses or once daily if SR	Bradycardia, constipation and peripheral edema
Serotonin antagonists	Pizotifen	0.5 mg at night	Up to 4.5 mg in 1 or 2 divided doses	Drowsiness, weight gain
Antiepileptic agents	Topiramate	12.5 mg bid	Up to 150 mg daily in 2 divided doses	Distal paresthesias, poor concentration, drowsiness
	Sodium valproate	200 mg at night	Up to 1200 mg in 2 divided doses	Drowsiness, weight gain
	Lamotrigine	12.5 mg daily	Weekly escalation by 12.5 mg daily up to 200 mg in 2 divided doses	Skin reactions, dizziness
Third-line Agents				
	Acetazolamide	250 mg daily	Up to 750 mg daily in up to 3 divided doses or once daily if SR	Flushing, confusion, depression, skin reactions, metabolic acidosis, polyuria, nausea, vomiting
	Methylsergide	4 mg daily	4 to 8 mg daily orally in divided doses with meals	Risk of retroperitoneal and pulmonary fibrosis, cardiac valvular abnormalities
	Cyproheptadine	4 mg at night	4–20 mg daily in 3 divided doses, max. 32 mg daily	Drowsiness, paradoxical stimulation, dry mouth, constipation, blurred vision
SSRIs	Sertraline	50 mg daily	50–100 mg daily	Nausea, vomiting, diarrhea, dyspepsia, anorexia, rash
Benzodiazepines	Clonazepam	0.5–1 mg at night	Increased over 2–4 weeks to usual maintenance dose of 4 mg given in 3 to 4 divided doses	Drowsiness, fatigue, dizziness, muscle hypotonia, coordination disturbances

bid = twice daily; SR = sustained release formulation.

Prophylactic Therapy for VM

- Anti Depressants
 - reduced the mean number of vertigo attacks from 12.2 to 2.6 over four months in 31 patients
- Propranolol
 - reduced the mean number of vertigo attacks from 12.6 to 1.9 over four months in 33 patients
- Topiramate
 - mean monthly vertigo attacks reduced from 5.5 to 1 and mean monthly headache attacks reduced from 4 to 1 after six months in 30 patients

PROPRANOLOL

- Nonselective beta-adrenergic receptor blocking agent
- Should be initiated at low doses along with monitoring of heart rate and blood pressure
- Propranolol reduced headache and vestibular symptoms significantly in vestibular migraine ¹
- Absolute contraindications include asthma, heart block, severe peripheral vascular disease, and Raynaud's phenomenon, hypotension, bradycardia.

PROPRANOLOL & VENLAFLEXIN

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Rhinological and Otological Society, Inc.

Propranolol and Venlafaxine for Vestibular Migraine Prophylaxis: A Randomized Controlled Trial

Mehti Salviz, MD; Turgut Yuce, MD; Hurtan Acar, MD; Abdullah Karatas, MD; R. Murat Acikalin, MD

Objectives/Hypothesis: We compared the effectiveness of venlafaxine and propranolol for the prophylaxis of vestibular migraine (VM).

Study Design: Prospective, randomized, controlled clinical trial.

Methods: Sixty-four subjects with definite VM were enrolled. The subjects were randomly assigned to receive propranolol (group P, n = 33) or venlafaxine (group V, n = 31) for VM prophylaxis. Dizziness Handicap Inventory (DHI) scores, the Vertigo Severity Score (VSS), and the number of vertiginous attacks were recorded before and 4 months after treatment. The Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) scores were also recorded to monitor the resolution of psychiatric symptoms.

Results: At 4 months after treatment, the DHI total score decreased from 55.8 ± 2.7 to 31.3 ± 3.7 and from 50.9 ± 2.5 to 19.9 ± 2.9 ($P < .001$), the mean number of total vertiginous attacks decreased from 12.6 ± 1.8 to 1.9 ± 0.7 and from 12.2 ± 1.8 to 2.6 ± 1.1 ($P < .001$), and VSS decreased from 7.3 ± 0.3 to 2.1 ± 0.4 and from 7.9 ± 0.3 to 1.8 ± 0.5 ($P < .001$) in groups P and V, respectively. However, the treatment effects were similar in both groups ($P > .05$). BAI scores significantly decreased in both groups, whereas BDI scores decreased only in group V.

Conclusions: This study provided evidence that venlafaxine and propranolol show equal effectiveness as prophylactic drugs for ameliorating vertiginous symptoms in VM patients. However, venlafaxine may be superior to propranolol in ameliorating depressive symptoms.

Key Words: Anxiety, depression, dizziness handicap inventory, migraine, prophylaxis, vertigo.

Level of Evidence: 1b.

Laryngoscope, 126:169-174, 2016

Other Prophylactic Therapy

- calcium antagonists
 - Verapamil
 - Diltiazem
- anticonvulsants
 - Topiramate
 - Valproate/ Divalproex
- Antidepressants
 - Amitriptyline/ nortriptyline
 - Venlaflexin/Desvenlaflexin

Contraindications in specific group of patients

Topiramate

- Glaucoma
- Kidney Stones
- Chronic kidney Disease
- Memory Loss
- Depression

Divalproex

- Young Females
- High Ammonium levels in blood
- Liver Disorders
- Depression

Flunarizine

- Obese Patients
- Parkinsons' Disease
- Extraparamidal disorders
- Depression

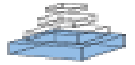
1. Bisdorff ;The Adv Neurol Disord (2011) 4(3) 183 191 DOI: 10.1177/ 1756285611401647

2. American Academy of Neurology® 2012;78:1337–1345

3. The Pharmacological Management Of Migraine, Part 2 Preventative Therapy; P&T® • August 2008 • Vol. 33 No. 8

Adjuvant Therapies

- Riboflavin (Thompson DF, Saluja HS. 2017)
- Magnesium (Von Luckner A, et al. 2017)
- Butterbur extract (Baier B, et al. 2009)
- Coenzyme-Q10 (Sandor PS et al. *Neurology* 005;64:713-715)
- Vitamin D



Current treatment options in vestibular migraine

Mark Obermann^{1*} and Michael Strupp²

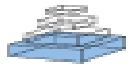
¹ Department of Neurology, Vertigo and Dizziness Center, University of Duisburg-Essen, Essen, Germany

² Department of Neurology, German Center for Vertigo and Balance Disorder, Ludwig-Maximilians-University Munich, Munich, Germany

RECOMMENDATIONS ON MEDICATIONS for ACUTE ATTACKS of VERTIGINOUS MIGRAINE

by Mark Obermann and Michael Strupp

- Zolmitriptan 5 mg (tablet, nasal spray, and dissolvable tablet) should be the first choice in the acute vestibular migraine attack.
- Rizatriptan may also be used ; any other triptan may be just as effective .
- Patients with excessive nausea or vomiting may prefer non-oral applications (i.e., nasal spray, suppositories or subcutaneous injections) or intravenous options such as acetyl salicylic acid 1000 mg or dimenhydrinate (62.5 mg) with metoclopramide 10 mg



Current treatment options in vestibular migraine

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¹ Department of Neurology, Vertigo and Dizziness Center, University of Duisburg-Essen, Essen, Germany

² Department of Neurology, German Center for Vertigo and Balance Disorder, Ludwig-Maximilians-University Munich, Munich, Germany

RECOMMENDATIONS ON PROPHYLACTIC MEDICATIONS for VERTIGINOUS MIGRAINE

propranolol 80–240 mg, or

metoprolol 50–200 mg, or

bisoprolol 5–10 mg, or

flunarizine 5–10 mg,

Topiramate 25–100 mg and

Valproic acid 500–600 mg

per day in patients with over three attacks per month,
with long lasting or disabling attacks

per day may be used as well

- Combination of drugs belonging to the same class is probably not reasonable, and the combination of topiramate with propranolol did not show an additional benefit to topiramate alone .
- Patients with frequent migraine attacks on 15 days per month for >3 months and with >8 days with migraine headache per month for more than 3 months should receive topiramate 25–100 mg.
- Patients who predominantly complain of vertigo or dizziness with typical aura duration, but without frequent migraine headache might be successfully treated with lamotrigine 25–100 mg per day .

Migraine Comorbid with Other Disorders causing Dizziness

- *Benign Paroxysmal Positional Vertigo*¹
- *Motion sickness*²
- *Orthostatic hypotension and syncope*³
- *Panic disorder*⁴
- *Depression*⁵
- *Anxiety*⁶

*Because of the frequent association of dizziness, migraine, and anxiety, a new syndrome named migraine-anxiety-related dizziness (MARD) has been proposed.*⁶

1. Ishiyama A, Jacobson KM, Baloh RW. Migraine and benign positional vertigo. *Ann Otol Rhinol Laryngol* 2000;109(4):377–380
2. JeongSH, OhSY, KimHJ, KooJW, KimJS. Vestibular dysfunction in migraine: effects of associated vertigo and motion sickness. *J Neurol* 2010;257(6):905–912
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Treatment of MARD *(migraine anxiety related dizziness)*

Balance Symptoms
Predominate

- Imipramine + Clonazepam

Anxiety symptoms
predominate

- Paroxetine
- Sertraline

Additional space
and motion
discomfort

- Vestibular Rehabilitation

LIFE STYLE MODIFICATIONS



Trigger avoidance



Regular sleep pattern



Regular meals and migraine diet



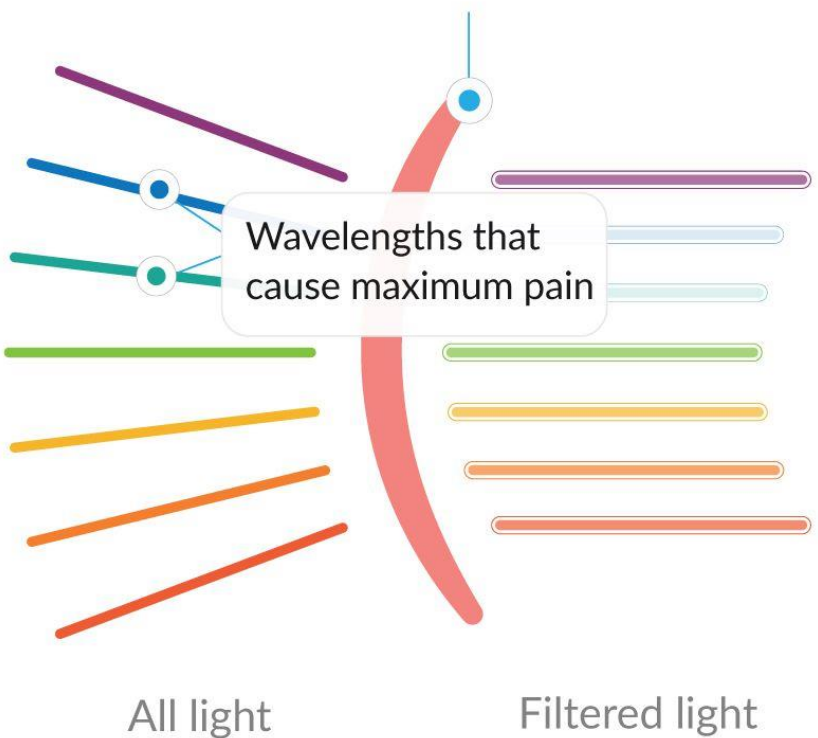
Exercise routine



Stress management

Addressing Co Morbidities

FL-41 lenses



referral, counselling, antidepressant therapy

pace and motion
ovic J: 2013, Sagay

with Meclizine, D

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py (Jastreboff PJ. Handb Clin Neurol. 2015;129:375-387



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VESTIBULAR REHABILITATION

- Targeting habituation to visual motion stimuli (for visually induced symptoms)^{1,2}
- Correcting the postural instability^{1,2}
- Loss of confidence in balance or visual dependence³

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VESTIBULAR REHABILITATION

Is the Headache in Patients with Vestibular Migraine Attenuated by Vestibular Rehabilitation?

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Background: Vestibular rehabilitation is the most effective treatment for dizziness due to vestibular dysfunction. Given the biological relationship between vestibular symptoms and headache, headache in patients with vestibular migraine (VM) could be improved by vestibular rehabilitation that leads to the improvement of dizziness. This study aimed to compare the effects of vestibular rehabilitation on headache and other outcomes relating to dizziness, and the psychological factors in patients with VM patients, patients with dizziness and tension-type headache, and patients without headache.

Methods: Our participants included 251 patients with dizziness comprising 28 patients with VM, 79 patients with tension-type headache, and 144 patients without headache. Participants were hospitalized for 5 days and taught to conduct a vestibular rehabilitation program. They were assessed using the Dizziness Handicap Inventory (DHI), Headache Impact Test (HIT-6), Hospital Anxiety and Depression Scale (HADS), and Somatosensory Catastrophizing Scale (SSCS) and underwent center of gravity fluctuation measurement as an objective dizziness severity index before, 1 month after, and 4 months after their hospitalization.

Results: The VM and tension-type headache groups demonstrated a significant improvement in the HIT-6 score with improvement of the DHI, HADS, SSCS, and a part of the objective dizziness index that also shown in patients without headache following vestibular rehabilitation. The change in HIT-6 during rehabilitation in the VM group was positively correlated with changes in the DHI and anxiety in the HADS. Changes in the HIT-6 in tension-type headache group positively correlated with changes in anxiety and SSCS.

Conclusion: Vestibular rehabilitation contributed to improvement of headache both in patients with VM and patients with dizziness and tension-type headache, in addition to improvement of dizziness and psychological factors. Improvement in dizziness following vestibular rehabilitation could be associated with the improvement of headache more prominently in VM compared with comorbid tension-type headache.

Keywords: vestibular diseases, migraine disorders, rehabilitation, treatment, vestibular rehabilitation, headache impact, dizziness handicap

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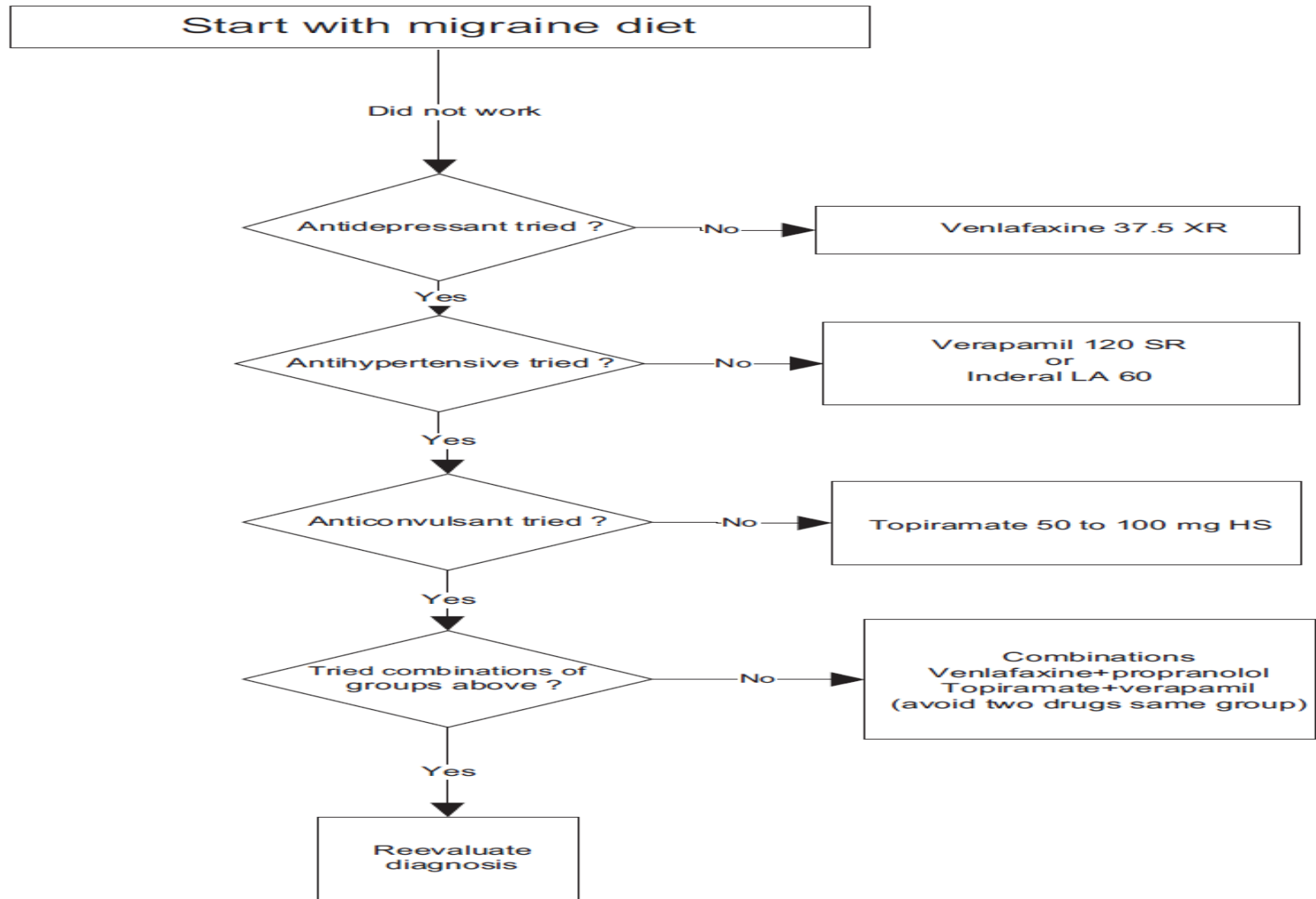
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Migraine and MAV prevention Flowchart



Take home message

- VM should be suspected when a patient presents with recurrent attacks of vertigo if other temporal conditions like MD, BPPV, MDD syndrome have either been
 - ruled out
 - findings to not typically fit into the diagnosis
 - has not responded to treatment specific for the disorder
- We need a rethink on the stringent parameters laid down by IHS for diagnosis of VM
- Mere absence of headache or presence of inner ear symptoms does not rule out VM
- A therapeutic trial with migraine prophylactic medication is indicated in suspected VM





Let us remember...

- Dizziness is a side effect of many medications, some of which are used in the treatment of migraine...always elicit history of medication
- Beta blockers may cause orthostatic hypotension, particularly in the beginning of treatment
 - Propranolol is the most extensively studied
 - Although a very old molecule, is still recommended as Level A by American Academy of Neurology)
- Antidepressants may lead your patients to experience sleepiness, blurred vision, lightheadedness and postural hypotension
- We must support Randomized Clinical Trials in Migraine-Associated Vertigo towards better treatment options for our future patients

And let us not forget...

**Don't
Forget**

- To certainly evaluate patients at 3 months: >50% reduction in attacks is a reasonable goal
- Migraine and vestibular disease can
- Patients who meet criteria for Ménière disease should be treated appropriately for Ménière disease, even if migraine headache exists
(Aggressive drug treatment for migraine is anyway more mild than aggressive treatment for MD)

Apologies for the lecture - induced Migraine

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