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Navigating Vertigo: Insights from Dubai

Presenter: Vishal Pawar, MD

- Welcome, everybody, and thank you very much for being with us today. Well, the scientific divulgation promoted by Inventis Academia and directed to all those interested in disorders and pathologies of the hearing and the balance system never stops. It is with great pleasure that I announce Dr. Vishal Pawar's entry into the Academia project. Dr. Pawar is an highly-skilled specialist, a neurologist, with over a decade of experience in neurology and otoneurology. He completed his studies in medicine and neurology in India, and he has been a valuable member of the Aster Gardens Specialty Clinic in Dubai for seven years. Dr. Pawar's expertise lies in vestibular medicine and headache disorders. And he has actively contributed to patient care, academics, and research in these areas, earning recognition as a fellow of the European Board of Neurology and establishing a dedicated vertigo clinic.

Thank you very much, Dr. Pawar, for accepting our invitation. I'm so happy to have you here today. Title of the lecture is "Navigating Vertigo: Insights from Dubai." During the webinar, Dr. Pawar will provide a comprehensive overview of vertigo, sharing his clinical expertise in Dubai. The seminar will cover the following key areas. Approaches for patient experiences of vertigo, spectrum of vestibular disorders in Dubai, and symptoms and signs of common vestibular disorders. As usual, I invite all of you to write down any questions in the space provided that you should see on the screen. After the event, you will receive a survey that I kindly ask you to fill out. The survey will help us to understand your needs, to get your ideas in order to provide the best educational support ever.

And now I lead the world to Dr. Pawar. Enjoy the webinar and see you later.

- Thank you, Anna, for that kind introduction. Good evening everyone from Dubai, all the attendees attending this webinar from different parts of the world. So in this particular lecture what I'm going to do is I will navigate through a spectrum of vestibular disorders, and I will give insights from Dubai. I will give Dubai experience,

like whatever experience I have gained from treating patients here. So these are my disclosures. It's a part of Academia programs. It's a part of speaker engagement program. And informed consent I have taken from patients which are shown in the presentation. Now, coming to the like what is the learning objective from this webinar? The most important learning objective is like how to approach a patient of vertigo.

And the second is to learn what are the common causes, not only in Dubai but usually these are the same causes which are common all across, like all over the world. Now, coming to the how to approach a patient. As we know that dizziness and vertigo is a very common symptom in medical outpatients. And the causes of vertigo and dizziness range from trivial cause to a life-threatening cause. A trivial cause might be a few seconds. For a few seconds some episode lasting of vertigo because of vestibular migraine, which may not be impairing the quality of life, like probable vestibular migraine. And it can be life-threatening because of a posterior fossa bleed, posterior fossa tumor, or it can be a posterior circulation stroke.

So let us dive into vestibular disorders, like what are the different causes. If we look at the different causes of vestibular disorder, broadly vestibular disorders are divided into peripheral vestibular. That is in relation to the vestibular nerve, like the vestibular apparatus. Then comes the central vestibular. Once the vestibular nerve enters the central nervous system and it goes to the vestibular nucleus, and there are a variety of pathways, vestibular connections with the brainstem structures, with supradental structures and with the spinal cord, that forms the central vestibular pathways. Or it could be a functional disorder. Functional disorder is a separate entity apart from the organic disorder or cellular disorders and psychiatric disorder. So, as I said, it can be a psychiatric cause of dizziness also like amongst these causes, or it can be a hemodynamic cause, which is very common in patients who are elderly.

Like polypharmacy is one of the very common cause of orthostatic dizziness, orthostatic hypotension. So those causes are also seen in the vestibular practice. And there are of course other post-op causes like metabolic, endocrine, which can also cause dizziness. Now, coming to the what are the steps to approach patients like with dizziness or vertigo or vestibular symptoms in general. So if we look at variety of like what are the steps to approach, these are the steps like. So these are the five steps which usually, like how I approach the patient, like symptoms. Then there comes the duration. Then triggers for these accompanying symptoms, which can be otological symptoms and neurological symptoms. And a fifth is evolution, like evolution in the form of a, you know, syndrome.

What syndrome we are dealing with? Like whether it is acute vestibular syndrome, or it can be a chronic vestibular syndrome, or episodic vestibular syndrome. So there is a famous approach to vestibular disorder which is called a "So Stoned" approach. And if we look at this, S stands for symptoms. O stands for often. How often the patient feels vertigo, like if a patient is having episodic symptom. And how often, the frequency is nothing but O. Then the S stands for since. How many days, like since how many days or since how many hours, weeks, days, months, years the patient is suffering from the dizziness. So the often and since decides the evolution of the patient like. Then comes the triggers.

Triggers are the most important in the history. Then comes the accompanying symptoms, which can be otological. It can be a neurological symptom. And then comes the evolution. Then we have to define the syndrome, what syndrome we are dealing with amongst the three major syndrome. And lastly the So Stoned, the D stands for duration, like how much, what is the duration of each individual episode. If it is episodic, how much, what is the duration of each episode? It's a very important parameter to decide what is the diagnosis. So let us dive into one by one all these steps. The first step is symptoms. So there was one study which studied what are the

different patient descriptions. And in that they found that there were 450 different descriptions of patients suffering from vestibular symptoms.

And routinely we practice, we see that in our practice the same symptom is described differently by different patients. And so Barany Society came up with a classification of vestibular symptoms. And the vestibular symptoms Barany Society classified into four major varieties, types. First is vertigo, second is dizziness, third is vestibular visual symptoms, and fourth is postural, like postural symptoms. Now, coming to the vertigo, what is the definition of vertigo according to the Barany Society? So vertigo is nothing but self motion when no movement is happening. Suppose I'm stable, my head is stable, and still I feel that my head is moving in any direction. It can be spinning, it can be shaking, it can be bobbing, it can be any type of movement.

But when there is self motion is happening, feeling of self motion when no movement is happening. Or it can be a sense of distorted self motion. For example, if I move my head from here to here, I should exactly feel this much angle of head movement. But if there is a sense of distorted movement, suppose this movement which happened, if I feel it is distorted, then that is also vertigo. Then dizziness, like dizziness could be a sense of, is nothing but sense of disturbed or impaired spatial orientation. There are some patients who are not able to describe the symptoms in any of these categories, and they just say that I'm feeling disoriented. I'm disoriented with respect to the environment.

So that is nothing but dizziness. And there is a list of symptoms called vestibular visual symptoms. Nothing but, in that category there are five varieties of symptoms. One is external vertigo. That means the environment is rotating. When the self is rotating or self movement is perceived, it is called as vertigo, internal vertigo or vertigo. And external vertigo is a vestibular visual symptom, where the patient feels that the environment is rotating. Then comes the oscillopsia. Then if the patient feels that the

environment is shaking. Visual lag means when the patient moves the head, they should be able to see the new visual scene clearly. But if there is a lag between the head movement and the clarity of the visual scene, then it is a visual lag.

Then comes the visual tilt. And sometimes the patients can feel that there is a tilting of the environment. Or it can be a movement-induced blur. Means when they move their head, then there is a blurring of vision. That is a movement-induced blur. And many of these patients what happens because it is related to the vision, many of these patients primarily consult ophthalmologist. And many of my referrals I get from ophthalmologist because then they rule out the causes which are related to the vision. And they... And it is noticed that it is everything, visual acuity and everything comes normal, and then the static visual acuity comes normal, and the patient is referred. And these are the vestibular visual symptom.

Then comes the postural symptoms. The postural symptoms, so patients can feel unsteady. There can be a directional pulsion. Patient can feel that they are moving in one direction. There can be balance related near fall. The patients might feel that they are going to fall. And actually they can fall, and that is called a balance-related fall, which is a newer terminology for drop attacks. Earlier, there was one terminology for drop attacks where the patients feel, patients suddenly fall without any warning or pre-monitoring symptoms the patients fall, which is called as balance-related fall. So vestibular disorders. One pearl, clinical pearl, here is vestibular disorders can cause visual symptoms. Throughout the presentation I will give some clinical pearls related to that particular discussion.

Now, coming to the second very important aspect of the history taking is what is the duration of vestibular symptom? So, like in duration, whether it is in seconds to minutes, whether it is in minutes to hours, whether it is days to weeks, or it is from months to years. So these are the common central causes. I didn't mention all the

central causes. These are the common peripheral causes. And this is a common functional cause, okay? Now, this is nothing but the umbrella term which is used for the functional causes of dizziness. So if we look at the causes which can lead to vertigo or vestibular symptoms, which last for seconds to minutes, the most common cause is BPPV.

And the second one is actually vestibular migraine. And it can be even vestibular paroxysmia. Like paroxysmia, classically the symptoms last for less than a minute. Then comes the duration of attacks lasting from minutes to hours. It can be transient ischemic attack, that is TIA, vestibular migraine and Meniere's disease. In vestibular migraine, the duration of attacks is five minutes to 72 hours. In Meniere's disease, the duration of attacks is 20 minutes to 12 hours. Then comes the days to weeks. Then the most common differential diagnosis in a patient who is having continuous vertigo dizziness or vestibular symptoms is either a stroke or acute unilateral vestibulopathy. Then comes the, like the duration can be like from months to years. In fact, usually these are the chronic neurological disorders like neurodegenerative disorders, tumors, demyelinating disease, or stroke, or bilateral vestibulopathy, or persistent postural perceptual dizziness, which is a very common cause of chronic symptoms.

Now, if we remove a little uncommon causes, 80% of the vestibular practice is, like constitutes these seven, eight causes of, seven, eight disorders. And it's very important to be thorough about these seven, eight disorders because that forms a major chunk of the vestibular symptoms in the clinical practice. So, and majority if we look at all the disorders, they're all treatable disorders. They're treatable, and like there is no, it's very important that, like these disorders, if they're diagnosed properly in time, we can save the patient's life. And majority of them are not life threatening, like for example BPPV, vestibular migraine. Like acute unilateral vestibulopathy. Of, course there is a lot of morbidity involved in these disorders, but majority of them are are not.

Like there is no immediate threat to life except in cases of stroke, tumors, and like multiple sclerosis, also it will lead to disability. Not to the immediate threat to life. So these are the variety of disorders which we have to see in like patients with respect to the duration. Then coming to the triggers. Like when vestibular symptoms, we have to see whether the patients have any trigger or there is no trigger. If there is no immediate trigger, it is spontaneous. And the most common causes of spontaneous vestibular symptoms is vestibular migraine, Meniere's disease, stroke, and transient ischemic attack. That is vascular vertigo. Then comes a triggered vertigo in that there are many causes. Like positionally triggered, it is typically BPPV.

Head-motion induced vertigo or dizziness most commonly in vestibular migraine, vestibular neuritis, but majority of disorders can lead to it. Visually-induced dizziness is typically seen in VID. That is visually-induced dizziness, vestibular migraine. Again, functional type of dizziness. Sound-induced and Valsalva-induced in third window syndromes. Orthostatic dizziness is a separate entity. Hemodynamic orthostatic dizziness. There are a variety of, there is a list of differential diagnosis for that. And there are certain other triggered entities also. So timing and triggers are the most important aspects of the history taking in patients with vertigo. Then comes the, like if we look at the triggers, the head motion-induced, the head movements can lead to vertigo. Or it can be orthostatic like either from lying down to sitting, or from sitting to standing, or in a continuous standing posture.

That is orthostatic. And then comes the like positional. Positional means when the patient changes position with respect to the gravity. That can lead to vertigo that is typically seen in benign paroxysmal positional vertigo. And these are the common positional changes in like, for example in posterior canal, while getting up in the bed or lying down. In lateral canal while turning in the bed. And anterior canal, bending forward or leaning backwards. These are the common, these things. So in case of this visually-induced dizziness, what happens is there are like a variety of triggers in the

visual field which can trigger dizziness. So that is visually-induced dizziness. Then comes the accompanying symptoms. Like in terms of accompanying symptoms as I already told, it can be either otological symptoms or neurological symptoms.

And variety of these otological symptoms or neurological symptoms, which point towards the diagnosis of central vertigo or central vestibular disorders are the deadly Ds like dysarthria, dysphagia, diplopia, numbness, severe postural instability. If the patient is not able to stand erect, then most likely we are dealing with central cause. And weakness. If the patient has some weakness, pyramidal type of weakness, then it is a central variety. So another very important sensory symptom associated with central causes is headache. If there is severe headache, it could be a harbinger of a stroke. Or if, headache is a very common symptom which is associated in patients with vestibular migraine. Headache is associated with vertigo. And in an episodic vestibular syndrome, we have to think of vestibular migraine.

In an acute setting, think of stroke. Then coming to the, if we look at the, as I told about headache and the vertigo, if a patient has vestibular symptoms of moderate to severe intensity lasting from five minute to 72 hours, and if there are more than or equal to five episodes, we pass our current history of migraine along with headache, photophobia, and phonophobia, visual aura, and if the headache is present then the patient should have four more, like out of these four two criteria. That is unilateral location, pulsating quality, moderate or severe in intensity, aggravation by routine physical activity. And it is not accounted by any other ICHD-3 diagnosis. So that is diagnostic criteria of vestibular migraine.

And coming to the like persistent postural perceptual dizziness in patients with... I'm sorry. If we look at patients suffering from functional dizziness, they have these characteristic symptoms. That is symptoms are more common in upper right portion. They have agoraphobia. That is dizziness in crowded places. That is more supermarket

when the people are moving in different direction. Open places, open places, there are no visual cues. That's why some patients feel dizzy, get disoriented. Especially I have some employees working at airports, they get dizzy in the environment. That open environment. And visually-induced dizziness, it's common in patients with functional dizziness. Dizziness while driving is a functional neurovestibular disorder in which motorists while driving a vehicle they can feel dizzy exclusively while driving.

They can feel this symptom. So this is about the persistent postural perceptual dizziness. Then if a patient has hearing loss and/or tinnitus, these are the differential diagnosis which would be considered. Those which in yellow like background are nothing but peripheral causes. The red one is anterior inferior cerebellar artery infarction, which is a central vestibular disorder. So if the patient has vascular risk factors like diabetes, hypertension, dyslipidemia, obesity, smoking history, or high ABCD-squared score, then it goes in favor of a central cause. That is a stroke, vascular etiology. And this is the ABCD score which should be used to determine the... In a patient with acute transient vestibular syndrome, how to decide whether it is due to a stroke or it is due to vascular etiology versus an inflammatory etiology.

So the obesity score will help in this regard. Now, coming to the anxiety and depression assessment, like in patients with vestibular symptoms, it is very important to assess their anxiety and the depression. And that is something which makes the vestibular practice complete. So, excuse me, just a minute. Yeah, yeah. So the assessment of psychiatric symptoms makes the vestibular practice complete because it's very important we are taking care of their organic or cellular component, but it's very important to take their psychiatric component. And the third component is functional component. That also is very important. And the fourth component is a cognitive component. So these are the various aspects of the like vestibular practice. And if we take care of each of these components, it makes the vestibular practice complete.

And the psychiatric disorders can cause vestibular symptoms. Psychiatric disorder can complicate the vestibular symptoms, and psychiatric disorder can be a consequence of a vestibular disorder. Sometimes the vestibular disorder causes severe vertigo, and it can trigger psychiatric symptoms. The patient can get panic attacks. Patients can develop generalized anxiety disorder. Or because suppose that some patients doesn't receive diagnosis, they can go into a state of depression. So these are the, this is about accompanying symptoms. Then comes the evolution. Like it is very important to decide how the symptoms are evolving. Like if symptoms are sudden onset and they are static, or they're improving, then it is acute vestibular syndrome. And the most two common differentials are, like one is posterior circulation stroke, which should be considered first, and the second is acute unilateral vestibulopathy.

The second important differential, like tempo of vestibular disorder, is chronic vestibular syndrome in which the patient has either static vestibular symptoms or gradually progressive vestibular symptoms or fluctuating vestibular symptoms. So the differential diagnosis for these three are different. And episodic vestibular syndrome, the patients can have symptoms which are on a daily basis. It can start in cluster, which is very common in BPPV. Or it can be irregularly placed. Like attacks are irregularly placed at different intervals, mostly which happens in case of vestibular migraine and Meniere's disease. So we have to just see what is the pattern of vestibular symptoms and evolution of symptoms. It helps in the diagnosis. Then comes the triggered episodic vestibular. In the episodic vestibular syndrome, we have to divide whether it is spontaneous and triggered vestibular syndrome.

So like these are the four common presentation. And the fifth presentation is a drop attack, which is the newer terminology for that is balance-related fall. So these are the common central causes. These are the common peripheral causes. And these are the common other causes. And if we look at the various syndromes, if we look at the

triggered episodic syndrome and look at only the most common ones, BPPV is the most common triggered episodic. Of course, vestibular migraine can present with positional vertigo. And it is one of the common differential diagnosis in this category. Spontaneous episodic syndrome. There are two, three differential. One is transient ischemic attack. Second is vestibular migraine. And third is Meniere's disease.

In acute vestibular syndrome, there are two very common differentials. That is acute unilateral vestibulopathy and posterior circulation stroke. But it can still be vestibular migraine in this category because acutely the patient can present with vertigo, nausea, vomiting, and it can be still vestibular migraine. And chronic vestibular syndrome is, also we have differential diagnosis in the form of persistent postural perceptual dizziness, which is one of the most common chronic vestibular syndrome. Now, we discussed about how to approach patient, a patient with vertigo. Now, the second part of my talk is what are the common causes of vertigo in my experience in Dubai. So, in Dubai, like I started maintaining a prospective registry of all my patients at vertigo clinic.

And we we have treated around 2,910 cases in the last 57 months. We are going to complete around five years. And I analyzed the data of first 1000 cases for like before this presentation. And with the age group of 14 to 83 and 64 nationalities because it's a multicultural society here in Dubai. So this is the spectrum of vestibular disorders here, where the central causes being a neurologist are more, I see the vestibular migraine being one of the most common central cause, 47%. And peripheral causes I see 31%. And functional and psychiatric causes around 12%. Of course, the patients with these diagnosed cases of migraine, they also have psychiatric comorbidity. So overall if we look at the percentage of psychiatric disorders in these, as a comorbidity as well as a standalone cause, it is 50%.

And the other causes, there are other causes like hemodynamic causes, drug-induced causes. So this is the data, and I will go into each one of them. And I will give you silent features like what are the most prominent features and most prominent things in that particular disorder. So if we look at the vestibular migraine, even though it is shown as 43%, but only 11% of them satisfy the diagnostic criteria of vestibular migraine led by Barany Society. 32% of the patients didn't satisfy the criteria, and they cannot be, like because they, it comes under either probable or possible vestibular migraine because vertigo was not a presenting symptom in many of them. It didn't affect the quality of life in some of them.

It was of less than five minute in duration, less than five attacks, or less than 50% attacks were associated with two of the four migrainous features. So if we look at the vestibular migraine criteria, it is a very stringent criteria. And very less people out of even clinically-diagnosed patients with vestibular migraine in the practice. Very few patients satisfy that criteria. Then if we look at definite vestibular migraine vertigo is a presenting symptom. It affects the quality of life, and duration is more than five, should be more than five minute to 72 hours. Now, coming to the third thing is BPPV. And BPPV presents the most common cause of positional vertigo worldwide. If we look at definite vestibular migraine only, but we can categorize these two into like the most common cause of spontaneous vertigo we can say is vestibular migraine.

And most common cause of positional vertical is BPPV. But both are like, you know, they are differential diagnosis. For example, vestibular migraine patients can have positional components, so that can mimic like BPPV. So, and vestibular migraine, that's how it is, like it is a very common cause of spontaneous episodic vertigo. Now coming to the age group in my registry, like age group is, mean age I found was 40. And in the studies, it is around 38 years. So it peaks around third or four decade, the vestibular migraine peaks. And it can affect children. Nowadays, I'm getting many children who are affected with spontaneous episodic attacks of vertigo. And it might be

with headache or without headache. And as early as eight years I have seen some patients, some children, kids getting affected with vestibular migraine.

And it can be as late as, as per the literature, it is 72 years. But in our registry, I found one lady at 83 years of age she was getting recurrent attacks of vertigo, which were very incapacitating, and her electronic device exposure was very high. She used to sit with the iPad. Everybody like at home goes for work. And she had a lot of screen time with, she was using iPad, all day almost. Almost 12 to 14 hours in a day. And that was leading to these particular vestibular symptoms. And she had history of migraine in the third or fourth decade of life. So now coming to the gender distribution. It is more common in females, of course, but in UAE experience I found that it is little more common in females but not very like what is reported in the literature.

And because the population in Dubai is unique, and there are, it has a different like demographics. That might be the reason why I'm getting a different, a little lesser percentage of females as compared to like males. Now coming to the, like if we look at the comorbidities, I found in our registry that almost 13.5% patients with vestibular migraine had comorbid or triggered persistent postural perceptual dizziness. So we know that vestibular migraine is one of the very common cause of triggered triple PD functional disorder. If the vestibular migraine is not treated in time, it can lead to functional dizziness. Now, and if we look at the other associations, like motion sickness is also very common in patients with vestibular migraine.

In my study, around 22% patients had history of motion sickness. Now, coming to the second disorder. That is benign progressive positional vertigo. In the registry of 1000 patients, like there were some patients, 97 patients who underwent positional testing. And like typical symptoms and typical nystagmus was seen in around 49 patients. That is objective BPPV. Typical symptoms without nystagmus, that is subjective BPPV, this was the presentation in 30 patients. And this is divided into two types. If a patient has

symptoms without nystagmus, it can be exclusively while sitting up, or it can be in any other position. So this is divided into sitting up vertigo. That is Type II BPPV. And sBPPV other than Type II BPPV. Of course, the differential diagnosis for Type II BPPV, there are variety of differential diagnosis, like short term, like short-term BPPV, posterior canal BPPV.

And there are tubular lithiasis, so variant of BPPV. So these should be considered in this setting of vertigo. If the patient doesn't have symptoms and no nystagmus, no symptoms, then we should, it should be categorized as probable BPPV spontaneously resolved. In a patient who is giving history of positional vertigo, and when you do it, if it comes negative, it's very important to repeat it because there are chances that it can be falsely negative. So despite of repeated testing, if it is negative, it is probable BPPV spontaneously resolved. Then this is the distribution of posterior lateral and anterior canal in my registry. Where posterior canal could be typical posterior canal or apo-geotropic posterior canal. Lateral canal could be geotropic or apo-geotropic.

And this was the distribution I found in my registry. Now, coming to the third common cause like, that is persistent postural perceptual dizziness. Currently, in my registry I have around 260 patients suffering from this, but I analyzed 86 cases before this presentation. And symptoms are triggered in specific situations. That is, upright posture, during head motion, visual triggers, crowded places, open places. It is relieved by supine position. Typically, the patients say that they feel dizzy in upright posture, but when they lie down they feel better. Then fewer variety of triple PD, that is without any preceding history of vestibular symptoms was seen in 34 like patients out of 86. And comorbid, that is the most common comorbidity which was observed was vestibular migraine.

Vestibular migraine is the most common trigger for patients with this triple PD. And it can occur due to some of the non-vestibular disorders. I have seen some patients

coming to me for treatment of epilepsy or coming for depression. They were having this functional disorder as well. So it can be accompaniment. Apart from vestibular disorders, it can accompany other medical illnesses, neurological illnesses. And VNG findings are non-specific in patients with triple PD. But a common observation I see is patients, when they hyperventilate they feel dizzy. But they don't get any characteristic nystagmus or they may show some abnormalities in VNG which are baseline because of the previous vestibular disorder. And they respond well to tricyclic antidepressants or SNRIs or SSRIs and vestibular rehabilitation and cognitive behavioral therapy.

So these are the three pillars of treatment. First is medication, second is vestibular rehabilitation, and third is cognitive behavioral therapy is very important in these patients. So the other, like these are the drugs. Venlafaxine, escitalopram. Even I have used amitriptyline in some of the patients, and it gives a good result. Then coming to the Meniere's disease, like in the first 1000 patients, I found 30 patients suffering from Meniere's disease. This percentage is very less because I'm a neurologist, but I do see patients with Meniere's disease coming with acute vertigo. And it can present with any of these combinations, like vertigo, tinnitus, and hearing loss. And this is a spectrum. Like, you know, vestibular migraine and Meniere's disease is a spectrum where there are patients with pure vestibular migraine at one end of the spectrum, and there are patients with pure Meniere's disease at another end.

There are patients of course who are having vestibular migraine with cochlear symptoms like episodic tinnitus, ear fullness, episodic blockage of ears. And there are patients with Meniere's disease with history of migraine. And of course there is something called an overlap syndrome. Around 13% of the patients satisfied the criteria for both the like disorders. That is, it satisfies the criteria for Meniere's disease as well as the vestibular migraine. Now, coming to the next one is acute unilateral vestibulopathy. In my registry of first 1000 patients, I found 18 cases. Examination of eye movements in the dark is key to the diagnosis. So here we have to remember two

things, like when it comes to a differentiation in differential diagnosis of acute vestibular syndrome, two most important things are, one is identification of a central cause by learning thoroughly about the central causes, central symptoms, central sign.

And second most important thing is, even it is important to not miss neuritis. Many of times patients with acute unilateral vestibulopathy, they're hospitalized because of severe vertigo imbalance, and they are observed. They're examined in the light. And they may not have nystagmus, apparent nystagmus in light. And the examination of dark or examination with friends is missing. And that leads to where confusion, MRI brain is done, which comes normal. So that is about acute unilateral vestibulopathy. And there is acute unilateral vestibulopathy, it could be due to stroke, and there can be a lack of other neurological signs. So it's very important that these patients are properly analyzed with HINTS plus and other testings like postural stability and other examination parameters.

And in this group of patients, HINTS plus is very important where HI stands for head impulse, which is abnormal, with the corrective saccade to midline with rotation of head. It is normal in case of central disorders. Nystagmus is unidirectional, horizontal and peripheral. And it is horizontal and direction changing, vertical torsional in case of. It can be any variety of nystagmus in central. And test of skew deviation is, there is no skew deviation peripheral. And there is a skew deviation in central. And the plus stands for acute hearing loss, which is actually, to be honest, like it is present, even it can be seen in peripheral vertigo patients with peripheral causes. But first thing we should consider is acute hearing loss with a patient with acute vestibular syndrome is central cause.

So these are, then other three cases of Ramsay-Hunt Syndrome, which I have encountered, where there are vesicles in the external ear, and there was a facial weakness. And the patient presented with acute vestibular syndrome. So this is about

Ramsay-Hunt Syndrome. And now coming to the very interesting entity, that is post-traumatic vestibular symptoms. And in my practice, I am started to see that many patients with vestibular, who develop headache after trauma, they also have dizziness and their imaging comes normal. They have both the symptoms. They have headache also. They have vestibular symptoms also, without any proper explanation to the symptom. And they have actually post-traumatic. There is, like we can't qualify it as vestibular migraine, but it is something similar to post-traumatic headache, which of migrainous variety.

Something similar to post-traumatic vestibular symptom of vestibular migraine variety we can call. Then comes the BPPV vertebral artery dissection can happen after trauma. Concussion can happen in the labyrinthine structure. It can be a labyrinthine concussion, or it can be a cortical concussion. Now, coming to the psychiatric causes. As I told, the psychiatric comorbidity is seen in 50% of the patients, and the psychogenic causes I have found in my registry in around 2.3% of the patients. Then comes the vestibular paroxysmia. I found 13 cases, stereotypical symptoms lasting for less than a minute. Two cases with coexisting trigeminal neuralgia. One with glossopharyngeal neuralgia. Two cases with positionally-triggered attacks. Hyperventilation nystagmus in three of these patients out of the six.

Venous loop in one patient. And three cases of secondary paroxysmia, like multiple sclerosis, vertical dolichoectasia, arachnoid cyst, and CP angle. And completely these patients responded to carbamazepine and/or gabapentin. Some of the patients I have known tried . It was very helpful, useful in these patients. And in these patients in the primary vestibular paroxysmia there is a vascular loop which causes focal demyelination in vestibular nerve, and which leads to these paroxysmal symptoms. And there can be a central demyelination in the vestibular nuclear area due to old plaque at root entry zone in one of my patients. This was leading to the vestibular

paroxysmia of brainstem, like paroxysmal symptoms. And it is called as vestibular paroxysmia of brainstem or brainstem vestibular paroxysmia.

This also responded to the carbamazepine. Now, coming to the next is vascular vertigo. It can be either transient ischemic attack, infarction, bleeds, or vertebral artery compression syndrome, which can cause transient ischemic attack. There are a variety of tumors. Some of the tumors can present with vestibular symptoms of unsteadiness, dizziness. Through vertigo may be very less common, but usually these patient present. As it starts compressing the cerebellum, the patients can have vestibular symptoms. They can even have positional vertigo. Then comes the other causes like drugs. Drugs, some of the drugs are notorious. I have seen, I have given pregabalin along with tramadol in one patient, and the patient had vertigo. So there are certain drugs which can lead to like vestibular symptoms.

It can be due to class effect, or it can be because of mechanism of action. Then syncopal dizziness. There were several patients who had syncope, neuro-cardiogenic syncope, postural orthostatic tachycardia syndrome, presyncopal symptoms, micturition syncope, orthostatic hypotension, carotid sinus hyperactivity, and defecation syncope. It's very important to identify the cause. Whether there is associated loss of consciousness or not will help in deciding. Then comes the other causes. So in other causes I could, when I tried to explore the other causes, these are the other causes I found in my registry. And coming last to the unknown, like there are, despite of investigations, thorough history and everything, I like could not diagnose some of the patients who were suffering from the vestibular symptom.

And it can happen that despite of testing. In these patients, if the imaging is normal and the majority of causes are ruled out, can give a migraine prophylaxis and check because sometimes these can be atypical symptoms of vestibular migraine, provided all other causes are ruled out. So this was the learning objective which we achieved,

and these are the three most common causes. That is, vestibular migraine is the most common cause of spontaneous vertigo. BPPV is the most common cause of positional vertigo. And functional dizziness or persistent postural perceptual dizziness is the most common cause of chronic vestibular syndrome. With that, I thank you all for patient listening, and I will be taking question, answers now after this presentation.

So I have a few questions here in the Q and A. The first question is, how often can vestibular neuritis recur per ear? Can we diagnose vestibular migraine without any headaches? Yes, both questions are so important. The first question is, how often vestibular neuritis recur per ear? It's not a, like I have reviewed the literature for vestibular neuritis recurrence, and around one to 3% patients can have recurrence. But how early they recur, like not sure about that. And yearly how many times it will happen, I'm not sure about that. But it can happen that patients can have recurrence. And it is similar, something similar to the Bell's palsy. Bell's palsy the patients have, there are chances of recurrence.

Around three to 4% of the patients can have recurrent Bell's palsy that is due to... One of the probable hypothesis is reactivation of herpes simplex virus. Something similar happens in vestibular neuritis where there is a reactivation, and it can recur. It can recur in some patients. Then coming to the second part of the question, can we diagnose vestibular migraine without any headaches? Yes, the answer is yes. Because if we look at the diagnostic criteria of vestibular migraine, there should be past or current history of migraine. Some of the patients have forgotten their, one-third or most patients they have forgotten their history of migraine, and that creates a confusion. Plus, if we look at the diagnostic criteria, the vestibular symptoms should be associated with any of the, like there are three symptom categories.

Headaches, phonophobia, photophobia, and other symptoms. So one of these three should be there, and headaches should be associated. If it is present, it should be

associated with two of the features. So it is not mandatory that every time the patient should have headache along with the vestibular symptoms. There will be, some of the episodes they might be having or they may not be having, or they might be having indirectly between the vestibular symptoms. Or if some patients exclusively present with vertigo, and they don't give you, they don't have any history of headache. Now, coming to the like role of oral corticosteroids in acute vestibular neuritis, medical treatment in pediatric migraine. Now, coming to this question, the role of oral steroids in vestibular neuritis, yes, there is a role of steroids.

It is again something similar to Bell's palsy, where we give steroids. And like even in vestibular neuritis in the early inflammatory phase. So basically when we look at neuritis, there are two phases. One is inflammatory phase, and the second is late phase or destructive. Whatever neurons, the nerve fibers are there. They're already damaged, so inflammation goes away. It is not a disorder with continuous inflammation. So it is earliest phase, there will be severe inflammation in the nerve. And it will lead to damage, permanent damage to some of the fibers. So if we have to prevent that damage to the nerve fibers, it's very important that we use steroids early. Something similar to the Bell's Palsy. It should be started within first 48 to 72 hours, and that is like beneficial, but if it is started late in the sick relief phase, then it may not help.

Then comes the medical treatment of pediatric migraine. See, what I do in pediatric migraine patients, whatever I saw is, first is I stress the parents about the importance of lifestyle modification. About the sleep, screen time, food timing, water intake, stress. All these things should be like counseled to the parent as well as the kid. Then comes the magnesium. I usually give magnesium, and it works very well. Like magnesium, I do give the half dose of the adult dose, like around 150, 200 milligram. And it works very well in this group of patients. And there are, of course, we can give propranolol in a

small dose, or there is a benzodiazepine. There are other drugs which are also available.

But I restrict my practice to lifestyle and magnesium to begin with. Then coming to the what is migraine prophylaxis. Beta blockers. Then migraine prophylaxis basically means is the preventive medications. There are basically three aspects of treatment of migraine. One is lifestyle modification. Second is prophylaxis. Prophylaxis is nothing but prevention. There are certain drugs, if they are taken on a daily basis or regularly, they will prevent the attacks which are going to happen. They may not help during acute attack, but they will prevent. It will address the underlying pathophysiology of migraine, and it can prevent the attacks of vestibular symptoms or attacks of headache. Then the role of beta blockers, yes, beta blockers are very good drugs, especially in young people who have high sympathetic discharge.

Those who have associated palpitations, associated anxiety, associated tremors, associated hypertension. So this is, they're very good like choice of drugs. And especially in vestibular migraine it is very effective. You start propranolol, and patients start getting better. We can choose cardioselective beta-blockers in patients who have asthma. I commonly use bisoprolol and nebivolol in patients with vestibular migraine, with a very good like improvement rate in these patients. Then comes the can vestibular neuritis be presented with mild, not severe, vertigo symptoms? Yes. Because, see, ultimately vestibular nerve has different branches, like superior vestibular nerve, inferior vestibular nerve, and the trunk, common trunk. So, ultimately, the nerve inflammation, it is involving how many fibers which branch, it will decide the symptomatology.

So sometimes we do see in practice that some patients don't have that typical catastrophic, you know, severe symptoms. Some patients have mild symptoms, and it can happen. And not severe vertigo symptoms. Then, do you recommend

nutraceuticals like coenzyme Q10, magnesium, B complex in vestibular migraine? Amongst these, I commonly prefer magnesium because magnesium is a very good nutraceutical, which is very effective in patients with vestibular migraine. Coenzyme Q10 I don't prescribe because of the cost involved and approvals from insurance. Like here, we have to take approvals, prior approvals. And it is costly, plus it doesn't get covered in insurance. Vitamin B complex, usually the magnesium comes with a combination with B6. Pyridoxine also can help. But in general magnesium is my favorite choice amongst the nutraceuticals for vestibular migraine.

Now, the next question is from Ms. Sharania. Like how many days should we wait for vestibular suppressants to wear off before performing positional nystagmus tests again? In general, my observation is, what happens is many a times these patients are prescribed vestibular suppressants, and then they come to you. And on the day of presentation, they have taken the vestibular suppressant. But still I don't hesitate to do the position. If, like they have, you come from long distance for the treatment, I don't hesitate to go ahead with performing. Yeah, after performing sometimes like to my surprise it is still there. Despite of the medication, it is, patients still have the positional symptoms and nystagmus. But my observation is sometimes the positional there is a dissociation between the symptoms and nystagmus with the vestibular suppressant.

The symptoms are less, but the nystagmus is present. So this dissociation can also be seen. So it is best to advise the patients to come. 48 hours, they should stop the vestibular suppressant. And usually for when I write the vestibular testing it takes two days for the approval process and getting them appointment. So, in general, that covers that period, and I tell them to come two days later and stop any suppression so that it is very important that the positional testing is done without any like limitation because of the suppressants. Then for how long migraine prophylactic drugs are given. Migraine prophylactic drugs, this is a golden question I can say. So, see, if we look at migraine, it's a spectrum.

If we look at 100 patients of migraine, there are patients who are having very mild, occasional headaches, and there are, at the other end of the spectrum, there are patients who are having on a daily basis they get headache, or they can get vestibular symptoms on a daily basis. So there is a spectrum. So what happens is all these patients must receive lifestyle modification. Like all of them must be told about like what lifestyle measures they should do to avoid these headaches, to prevent these headaches. All of them should receive this advice. There is no doubt about that. But when it comes to like this thing, when it comes to the... One second. I will just stop sharing my screen so that I can see.

Yes. So if we look at the drugs which are used for prophylaxis of migraine, all the like literature will, if the patient has episodic migraine, like between four to 15 attacks of headache per month, or more than 15 is a chronic migraine, definitely that is an indication to start prophylactic agent and they should receive it at least for first six months. But I generally avoid to tell this to the patient in the first visit because there is a lot of anxiety involved because they start feeling that they have to take a medication for six months. So I generally tell them to just take for one or two months. We will see how it goes, and then they come back to the follow-up.

Then I counsel them that we have to continue this therapy for six months. Six months later, what we should do is we can, there can be positive discontinuation of the treatment. So if the patient has got good improvement, and the patient starts following the lifestyle, it takes time for them to take care of the lifestyle. And six months is a very good time to take care of the lifestyle. And I tell them, "If you want to get rid of the drugs, "focus on your lifestyle." And after six months, I stop and check. There are three possible outcomes after six months. First is their migraines can recur immediately as soon as it is stopped. These are the patients who will need a longer term of treatment.

It's not like only six months is enough. These patients will need a longer course of treatment. The second group is if it goes under remission, the migraine goes in remission, and it reappears again when there are changes in lifestyle or weather changes or some other triggers, it can come back, again we can give a six-months course. Not at a time, but one monthly, two monthly or three monthly. Or there can be third group of patients where, lucky patients who don't get an attack later on. It doesn't, it is not that severe. And that is the third group of patient where we can stop after six months. So it is not one basket, one rule for every patient.

Or six month and stop. No, we have to decide from patient to patient severity. Now, coming to the next question from Nora. Does Botox injection for migraine effective for vestibular symptoms? No, it is mainly effective for headaches, chronic migraine, but as far as I know, it is not effective for vestibular symptoms. But I do have experience of patients with, I have treated patients with vestibular migraine with CGRP drugs. The newer CGRP medications, which are monoclonal antibodies against the CGRP. I have around 15 to 20 patients where I have tried different drugs like Erenumab, Galcanezumab or like Rimegepant, newer small molecules. And they are very effective. My observation is, without headache even, even for vestibular symptoms, they're very effective.

Something similar to other migraine prophylactic agents. So I have covered most of the questions here in Q and A. And the next one is, there were some, there is some comments in the chat. Yeah. No, I have covered all the Q and A, yeah.

- Yes, absolutely. So it seems there are no more questions, Dr. Pawar. And as we have arrived at the conclusion. So thank you very, very much, Dr. Pawar, for your presentation, an outstanding learning opportunity. Thank you so much. I really appreciate it. In the coming year, we anticipate the pleasure of meeting Dr. Pawar once more. In fact, our team is crafting a three-part course entitled "Fundamentals of a Video

Nystagmography," sorry. Expected to be unveiled next spring, more or less. Additionally, we are in the process of developing a three-part course focused on the video head impulse test. For this reason, we encourage you to stay tuned to Inventis social media channels and register for upcoming events hosted by Inventis Academia.

Remember, you will receive a survey very soon that I kindly ask you to fill out. The survey will help us to understand your needs and your suggestion. Thank you very much, Dr. Pawar, once again. Thank you very much to all of you, and see you soon with Inventis Academia and with Dr. Vishal Pawar, a new member of our board. Thank you.

- Thank you.

- Bye-bye.