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## Setting up Pediatric Vestibular and Balance Services

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FEBORLHNS

- Hi there. Good morning and good afternoon for those who are listening from my part of the world. So I'm Dr. Jeyasakthy Saniasiaya. I'm a Pediatrics ENT specialist in University of Malaya, Malaysia. So it's been over almost two years that I've actually started up pediatric vestibular and balance service. And today I would like to share a little bit on setting up a pediatric vestibular and balance service.

- Sure. One second, Dr. Jeya.

- I have nothing to disclose.

- Just a moment. I just wanted to welcome everybody and say thank you very much for being with us today. Just one note.

- Oh, sorry.

- No worries. I will leave the word to Dr. Jeya.

- So have I started yet?

- No worries, no worries. So the scientific education promoted by Inventis Academia and directed to all those interested in disorder and pathologies of the hearing and balance system never stop. Today, Academia hosts for the first time and it is an honor for us. To us, Dr. Jeyasakthy Saniasiaya, okay, did I say correctly your name, Dr. Jeya?

- Yes, it's correct.

- Fantastic. So as Dr. Jeya said, she's a pediatric otolaryngology surgeon in the Department of Otolaryngology at University of Malaya in Malaysia. I just want to say

thank you very much, Dr. Jeya, for accepting our invitation. It is really much appreciated.

- Thank you.

- The title of the lecture is Setting Up Pediatric Vestibular and Balance Service. One note, as usual, I strongly invite all of you to write down any question in the space provided that you should see on the screen. After the event, you will receive a survey. 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 Academia support ever. And now I leave the words to Dr. Jeya. Enjoy the webinar and see you later.

- Thank you. Thank you, Anna. Hi, good morning and good afternoon for those who are listening from my part of the world. I'm Jeyasakthy Saniasiaya, and as Anna mentioned, I'm a Pediatrics ENT specialist. So now it's been approximately two years that I've actually started up a pediatric vestibular and balance service in Malaysia and I would like to share on setting up the service here. Now I have nothing to disclose. So whenever I'm given a task, I run by Kipling's poem of six honest men. I will try to answer what and why, when and how and where and who. So when you talk about pediatric vestibular medicine, over the past decade, I must say that it has gained some attention.

There has been quite a number of publication and research revolving around pediatric vestibular medicine. But then the issue here is there are very small numbers of centers and physicians who actually perform assessments in pediatrics in terms of vestibular medicine. Now we know that children are not little adults, so dizziness in children and adults are also different. Now, similar to that, dizziness in children and adolescents are also not the same. Now in various publications, the prevalence has been reported to be between 0.7 and 15%. But then if you ask me, the numbers are actually higher. Now

you may wonder if I'm saying the numbers are higher, how have you not encountered them frequently? Well, there are a few contributing factors.

The first is child finds it difficult to verbalize symptoms. Whether it's lightheadedness, it's unsteady, imbalance, child is unable to verbalize the symptoms. Next is the short-lived nature and rapid compensation. So this is owing to the child's neuroplasticity. And interestingly, children tends to tolerate the symptoms better. Now the next part is on lack of awareness. I would say around 75% of parents who actually visit my clinic, they don't actually believe that the child can actually be dizzy. And one more thing is there's lack of awareness also amongst physicians. So when the parents brings the child to the clinic, it often gets brushed off. Lack of expertise in pediatric vestibular, this is definitely an issue in most parts of the world, especially in Southeast Asian region.

Now, I recently conducted a systematic review and meta-analysis to understand the global prevalence of vestibular dysfunction in children and in adolescents. And I found that among 39 studies, the prevalence is 30.4%. So we know that children don't present typically with spinning sensation. Now how do they present with? So children comes in with atypical presentations like being clumsy. The parents will actually tell you that the child bumps into cupboards, frequently falls off, child dreads swings, they hate going to the playground, they have exaggerated motion sickness and have difficulty to learn to ride a bicycle. So these are all like red flags that there may be some problem with the vestibular function. The other thing is hearing loss. We know that profound sensorineural hearing loss, nearly 70 to 80% of children have some form of vestibular impairment.

And this is related to the anatomorphological and embyologically cochlear and the vestibular organs, they arise from otic placode. Now in our theories, we found that children with isolated speech and language delay have actually some form of vestibular

impairment. Okay, so in a dizzy child. it's almost always related to vestibular impairment or dysfunction. This may not be entirely true because child can actually be dizzy because of other factors like vergence insufficiency, either convergence or divergence. It could be because of psychogenic or some form of somatoform disorders. Medication induced, especially vestibulotoxic drugs like Gentamycin, which is given to childrens widely. Neurological conditions may be brain tumors that can cause the child to be dizzy. And let's not forget postural hypotension or orthostatic dizziness, and also POTS or postural orthostatic tachycardia syndrome.

This may all be contributing to dizziness in children, which is why meticulous investigations is important. Now I mentioned earlier that adolescents and dizziness is not the same with dizziness in children. So I performed a review to understand about how dizziness in adolescents are, and I found that it's oftentimes multifactorial, which means that in an adolescent, they can actually have two contributing factors. And the etiologic factors can either be cybersickness, PPPD or persistent postural perceptual dizziness, somatoform disorder, orthostatic dizziness and post-concussion. Let's not forget vestibular migraine. Now adolescents, they undergo major changes in terms of puberty, growth spurts, emotional, cognition and social. And interestingly, the neuroplasticity amongst children is not present in adolescence, which means they don't rapidly compensate and they don't tolerate vertigo symptoms or dizziness symptoms better.

In my series, what I actually found is the most common etiologic factor causing dizziness is vertiginous migraine. Specifically it's the abdominal migraine, cybersickness, PPPD, orthostatic dizziness, post-traumatic BPPV and somatoform vertigo. Now the Brodsky's group in Boston published this article on multifactorial characteristics of pediatric dizziness. In their series, they found that 44% have multiple contributing diagnosis, and it's attributed to vestibular migraine, which is diagnosed with either BPPV or PPPD. Now again, I would like to highlight that vestibular

conditions actually may differ according to age. So in a younger group you may find it's because of profound sensorineural hearing loss. And in toddlers it's because of otitis media effusion. In older childrens it's causes like vestibular migraine, cybersickness, and PPPD.

Now this is important to understand why. Why are we assessing vestibular dysfunction? Why do we even care? Lots of research has actually pointed that children with vestibular impairment has delayed motor and balance dysfunction. This actually means that this group of childrens, they tend to sit, walk and stand at a later age compared to their age-matched peers. Not only that, this children shows some form of learning disabilities. So visual tasks like learning to read becomes a problem because of impairment of gaze stabilizing function. This in turn affects their scholastic performance and impairs their psychosocial and overall quality of life. So this is an interesting question. When should we assess? So what I've actually done is vestibular assessment in my center, I've actually made it a routine assessment.

So I run a Pediatrics ENT clinic. I've actually taught the junior doctors and residents to inquire during history taking to incorporate questions like motion sickness, or is there any delay in development, or is the child dizzy in older children? Another thing that we can actually do is to incorporate it as a part of a national curriculum. Now when we are able to detect vestibular dysfunction earlier, we're able to rehabilitate earlier. Now if that is not possible, of course, assessing every child that walks into your clinic may not be entirely possible. So this group of childrens, the high risk group, especially the ones with hearing loss, the ones with ototoxic drugs, delayed motor, some form of sensory processing or integrative disorder.

So this group of childrens are actually prevalent nowadays, motion sickness, those with otitis media effusion and learning impairment. So this group of childrens I think would definitely benefit an objective quantification of their vestibular function. So which

test to choose? So this of course depends on the child and parents' complaints, but I think you don't wanna miss out. And if you're new and you're just starting, you need to try to do all the vestibular tests. You want to assess both objective and also functional tests. The problem with this is of course, time, cost, resources and child's cooperation. So what I actually do is when the parents with the child comes to my first visit, it's usually history taking because you need to take meticulous history, and that takes about half an hour to an hour.

And I usually carry out simple bedside or subjective assessments. And for objective tests, they come over another appointment. So the parents know ahead that they will be coming over a couple of visits. So how do we start? How can we approach? I believe that we need to start with ourselves first. So it's important to gain knowledge on pediatric vestibular medicine. You can't translate the knowledge on adult vestibular into pediatric vestibular. So attend courses, attend conferences, collaborate with experts. So this has been a tremendous help for me. And of course you can go for short attachments and trainings in centers that has established pediatric vestibular medicine. So what worked for me was when I first started off, I wanted to understand how different conditions were.

And what I did was I performed systematic review and meta-analysis. So I wanted to know how the global prevalence, what the global prevalence is, then how vestibular dysfunction is among adolescents. So I just performed a systematic review, which actually helped me understand. Collaborating with experts as I mentioned earlier, was a tremendous help. So this is me with Professor Sharon Cushing and Sighet, and I did a short attachment in Alder Hey Children Hospital with Prof Soumit and Dr. Sudira. And it definitely makes a difference because when you come back, you gain confidence to start treatments or to rehabilitate the children and to manage the childrens. Now one other thing that I actually did was when I wanted to start the service, it's supposed to be one of the first service in my country, I wanted to understand what the level of

awareness, what is the level of awareness of vestibular dysfunction amongst ENT specialists?

So I conducted a survey. I sent Google form and 137 ENT specialists participated. And questions that were asked is on experience working with children. I wanted to know if at all it's a routine assessment in a child, and I wanted to understand why. What was the reason that it's not a part? So most of them answered that it's the patient or the parents that does not complain. And why do I think it's not widely encountered, and most answered that it's because of lack of awareness. So this gave me a foundation to understand how and where we are at. So this thing is really familiarizing with vestibular tests and equipments is extremely crucial because objective quantification of vestibular function is really necessary to understand which specific lesion that the child has.

Is it otolith dysfunction? Is it utricle saccule, if it's the semicircular canal? Now if that is not possible, we can start with subjective assessments. It's just simple history taking. Inquire child's overall developmental milestone if there is a delay. So this is a red flag. Next is perform a complete head and neck examination, not to forget otoscopic examination. There's no point in carrying out all the objective assessments when we've actually missed out on simple otoscopic examination that will actually tell us it's probably middle ear effusion, like the picture that I'm showing here. And of course complete neurological assessment. And let's not forget when we are performing vestibular assessment, we must perform audiological assessments as well. So in infants, especially in children younger than one year of age, it's the reflexes that you want to assess.

So this is one thing that really helps, performing single leg stance test. How it's done is basically you tell the kid to stand on one leg, and you count the duration of one foot stand, and it alternates with the other foot. So this test is done with eyes open and with eyes closed. Another assessment that can be done easily in clinic is a heel to toe test,

and of course, a Fukuda stepping test. I must tell you that childrens actually love doing such tests. Another thing which is important is to incorporate questionnaires, so we use the Vanderbilt Pediatric Dizziness Handicap Inventory. So this questionnaire is used for children between 5 to 12 years of age. In adolescents, we actually use the Dizziness Handicap Inventory.

Another thing that I do is during the first visit, I usually ask the child or the parent on a scale of 1 to 10, how does it affect their quality of life? And subsequent follow up, I also ask them how badly the symptoms affect your life. So you can actually tailor your management accordingly. So you need to develop a protocol, and this is according to your own practice. So I've come up with a pediatric vestibular assessment checklist. And also here, this is a pediatric vertigo diary that I actually hand over to childrens with vestibular migraine so that they can actually mark and tell me, and I can manage the treatment accordingly. Blood investigations, this is extremely important. We should not forget blood investigations because it could be anemia that is causing dizziness or it's an autoimmune condition.

So the ones listed here are blood investigations that I order in childrens who are being referred to my clinic. So I'm sure you've heard that you need to set up your own normative data. Whichever objective test that you're doing, say it's a video head impulse test or it's a cVEMP, you need to have your own data for your own population. I've actually noticed that it may differ according to the child. So in my center, I divided the normative data according to the table here, toddlers, early middle childhood, early adolescence and late adolescence because they may differ. And you need to understand that the vestibular system fully matures at about 15 years of age. And when you're selecting the normative group, you need to be as vigilant as possible, to exclude things like prematurity, ototoxic drugs.

You must ask as many questions as possible. So this is another thing which actually helps to create awareness is to give talks and seminars in your own hospital. So this is me, this was last week actually. I gave a talk on otitis media effusion and balance in children during the World Hearing Day. This really helps out. So I think a year ago I gave a talk at the hospital CME on what are our services and what should be referred to. So at least the other pediatricians or physicians know what sort of conditions to refer to you. So this is another interesting thing that would actually help is if you can carry out a free vestibular screening program.

But I think what actually helps is there are many centers that has been carrying out pediatric hearing assessment. So you can incorporate the vestibular screening together. Now back to equipments, I mentioned earlier objective vestibular test is ideal. You wanna get an objective quantification, but the biggest challenge of course is funding. You can actually try to get in touch with local distributors to come over and show how it's done. They can actually lend it for a period of time, and then you can maybe rent it. One other thing that actually helps is collaborating with other departments. So you see here, this is the Biodex Balance Stability. It's in our engineering department, and the computerized dynamic posturography, which is found in our rehab department.

So when I started off, there was nothing to start off with. So what I did was modifying equipment, so modifying instruments. So this is a Frenzel glass. So you use a 20 diopter lens to create the spectacles for the childrens. And this is a bucket test. You can either use just a simple bucket test or you can use the Apple iPhone software. Now whatever instruments that you have in the clinic, you're dealing with children and it's important to have attractive toys with musics and light, because trust me, the child really gets tired after you're performing more than two tests. So training sessions for staff is equally important. Although in my center I actually carry out every single

objective and subjective test, it's important to have staffs which are trained in pediatric vestibular medicine.

And if you're starting off and you're just learning, before working with children, try it on adult patients first. This was me two years ago, I'm actually performing vHIT in one of our residents. So this is another interesting thing, where to perform the test. It's children and you need to have a child-friendly room. But for pediatric vestibular assessment, try not to get too many things because this may cause anxiety, especially in teenagers who have space and motion discomfort or PPPD. Having too many things may actually cause problem for them. Another thing that you can actually do is have a different room for assessments. So this is pretty much the test that we actually carry out in our center.

Some small tips and tricks of working with children, child-friendly in the room, as I mentioned. Get parents involved. So this is a huge savior. Parents can actually help redirect the child's attention by playing their favorite videos, flash toys and interesting stickers. Child definitely have short attention span so you need to be really patient. So get parents involved. Sometimes I get the child to sit in the mom's lap. And this is me performing a cVEMP in a child, and I get the dad to hold tap. Play games with the child. Child loves this. So your assessment should incorporate as many games as possible when possible. So this is at our pediatric rehab center. Okay, moving on is multidisciplinary team.

This is extremely important when you're working with pediatric vestibular medicine. Try to collaborate with other team members. So these are the team members in my center. It definitely takes time. Spend time, meet them personally, talk to them, tell them about your services. So why do you wanna involve multidisciplinary team? Of course it's expertise. We know that it's multi-factorial and it could not be necessarily vestibular dysfunction. You need the equipments and of course to manage the patient. So this is

a tilt table test that we have in our pediatric cardio center. This is to assess POTS, postural orthostatic tachycardia syndrome. And this is the occupational therapy unit. And tests like vergence insufficiency, it's best to get the pediatric ophthalmology team involved.

So some small tips to collaborate with other teams is you do the work. You do the paperwork, you organize the meetings, get them involved in your research, they love that. And of course, be patient. Now it's been almost two years that I've actually started my pediatric vestibular and balance service in my center. Overall the most common condition that we have found is vestibular migraine by hearing loss. There's this other pool of patients that I do want to highlight is the kids with learning impairment or the child with some form of sensory processing or integrative disorder. So do try to do vestibular tests for them because I have found that there is some form of vestibular delay.

And why, why do we wanna know this is because whatever therapy that they're going for, incorporating vestibular rehabilitation helps. So now what's next? Vestibular rehabilitation specific for children. I think in most centers what's happening is the rehabilitation which is practiced in adults is being translated to children. That may not actually work. So virtual reality, we're moving towards virtual reality in peds vestibular rehabilitation. And it'd be great to have specific rehabilitation depending on the type of nature of dysfunction. So this is another interesting and important thing. So this is the Flanders, this group. They have actually set up this vestibular infant screening amongst children with hearing impairment. So similar to the universal neonatal hearing screening, we are heading towards vestibular infant screening.

And another thing is the artificial intelligence and machine learning. This has been carried out in a lot of medical field. Pediatric vestibular medicine, there is yet any. Next is biomarkers in pediatric vestibular disorders. We are still looking out for biomarkers

for various conditions. So I've almost come to the end of my talk. So pediatric vestibular assessment is crucial. Start with simple history taking and bedside assessments. Try to get vestibular assessment or evaluation as a part of routine assessments. And I must highlight the importance of multidisciplinary team and expert collaboration. So this other thing helps is organizing. You've started up your service. Organize courses, collaborate with international speakers. So I'll be conducting a course next month and I think this is a great way to create awareness among physicians, to start off with even medical students so they are aware of such conditions from earlier on. Though relatively new, I'm extremely, extremely grateful for all the help and support that I have been receiving from all my specialists. And thank you.

- Thank you very much, Dr. Jeya, for your fantastic presentation, a really outstanding learning opportunity. Let me underline once again that Dr. Jeya has developed the first pediatric vestibular and balance clinic at the University of Malaya Medical Center, which is also the first of its kind in the region, so an important effort in order to achieve an important goal. My congratulations, Dr. Jeya.

- Thank you. Thank you so much.

- Thank you. It is the question time. So let me check if we got the questions from our audience. Dr. Jeya, can you read the question by yourself? Can you open the question folder from the go to webinar menu?

- I'm trying to look at it.

- If you want I can read the question for you because I can see it.

- Yes, thank you.

- Sure. So our attendee asks, "What are the typical symptoms displayed by a patient with abdominal migraine?"

- Okay, so that's an interesting question. So children's with abdominal migraine, they have symptoms of migraine and they have stomach pain as well. So they have reflux symptoms and it's predisposed to abdominal migraine. How do you want to find out whether it's abdominal migraine is you can actually work with a gastroenterology team. These kids, they have features of vestibular migraines, so they have headaches and dizziness, and precipitating it could be because of the epigastric pains that they may have. So treatment for abdominal migraine, what I actually do is similar to vestibular migraine, and of course it's the lifestyle modification. So you have to understand in any form of migraine, abdominal migraine or vestibular migraine, it's the lifestyle modifications which is sustainable instead of putting the child on long-term treatments.

I'm not saying that you don't wanna start them on medications. Of course, the first line treatment in my center is propranolol, but then you need to think of what is sustainable. So it's the strict healthy lifestyle modifications.

- Thank you very much, Dr. Jeya. A second question from an old friend, Dr. Shahid Mayad. Hello Mayad, a pleasure for me to see you here. Thank you very much for being here with us even today. So Dr Jeya, the term I had asked you what do you think. Are SVV and SVH important in pediatric vestibular assessment? So the importance of SVV and SVH in the pediatric assessment.

- Okay, so I usually perform a subjective visual vertical test and it's the perception of verticality. So what SVV is for is 'cause you wanna look at what is the child's perception, either vertical or horizontal. So this can actually tell me whether it's an otolith dysfunction, specifically the utricle function. And I think it's more functional

because although an oVEMP also can objectively test a utricle function, the SVV is more of a functional test.

- Thank you very much, Dr. Jeya. The second question from Dr. Mayad. Okay. Dr. Mayad asks you, my second question, it should be done with eyeglasses or without glasses if eyesight is weak?

- So the eyeglasses, so I'm sorry, for which test is this? If it's a subjective visual vertical, I actually, because it's a bucket test, I actually get the kids to wear their glasses 'cause it's the perception of verticality and so I need to know. They need to actually look at the line. Yeah.

- Okay.

- So unless you're performing a video head impulse test, then they would remove their glasses. But if it's for subjective visual vertical, yeah, they have their glasses on.

- Okay, then a question from Samana, hello, Samana, thank you very much for being here, Samana asks you, "have you ever performed VNG for children from six month to one-years-old?"

- Well, okay, thank you for the question. And the answer is unfortunately no. I'm sorry, but I know that it's actually possible to do a VNG in children and you can actually perform it from six months of age. But yeah, I've yet to perform. So in very young childrens it's the reflexes that I test, and six months onwards it's the cVEMP that I actually carry out, and also video head impulse test. So it's interesting that I actually did, I started doing video head impulse test 'cause I did see various publications on doing in younger childrens as young as six, three months or six months. So the youngest that I've done is six months of age, but of course you can't get every canal

possible. It's only the lateral canal. And what actually helps is of course the attractive toys and light.

- Okay, fantastic, Dr. Jeya. Another question from Mohamed, I really hope to read the questions correctly. Okay. So Mohamed asked you, Dr. Jeya, "As a speech language pathologist, how can we counsel the parents to do vestibular test for their children? And what are the significant symptoms that shows in the children to do vestibular test?" I just read the question as I get it.

- No, no, I understand the question. So this is a new thing that we are actually conducting a research on childrens with isolated speech and language delay. They're referred to our clinic for hearing assessment. And if you see these childrens with isolated, so we talk about speech and language, it is the form of sensory, and these kids have some form of developmental delay. If you were to perform vestibular, an objective vestibular test, you can see that there may be some form of abnormality. In my center, I have seen that these kids have a delay of an abnormal subjective visual vertical in this group of isolated speech delay. Now, so the parents might ask, why do I wanna do this test?

It's because it affects their overall school performance. So we know, the knowledge that we know that vestibular impairment or vestibular delay affects school performance. So if I tell this to the parents, it definitely convinces them. And together with their speech and language therapy, it's just incorporating simple exercises. So I've actually developed a simple vestibular exercise. You don't have to buy anything. You just have to perform exercises.

- Okay, so exercises. Fantastic, thank you, Dr. Jeya. So another question. "What are the most common symptoms of vestibular problem and how to differentiate them from other symptoms?"

- So the symptoms, vestibular symptoms in children?

- Yes.

- Okay. So child and adolescents, so in teenagers, older children they can tell you that they feel like it's spinning, they have headache, they feel imbalanced, they feel like they're on a boat, but a younger child, they're not able to tell you they're dizzy. It's the atypical symptoms like they're being clumsy, they bump into things. They dislike bicycles. So it's that atypical symptoms that they present with. I have a child with otitis media and effusion. So when this child gets an acute otitis media, he feels dizzy and he tends to hold objects and he starts to scream and cry. And he tells mommy that the building is falling, the building is falling. So the parents went to, I have to highlight this case because the parents went to a couple of centers before coming to my clinic, and it's just the otitis media effusion that caused the attack, I'm sorry, the acute episode, acute otitis media that caused the dizziness.

- Okay. I think the answer is definitely clear. Okay. Another question, Dr. Jeya, so from Dr. Upshati. Okay. Children with ADHD have a higher rate of balance disorders. They are difficult to test. How we can test them?

- How to test the ADHD children?

- Yes.

- Okay. Groups with ADHD and also the ASD or autism spectrum disorder, this group of childrens is definitely a challenge for me because they are hyperactive, they're not gonna sit still, they're very aggressive. And this childrens, they have actually undergone a lot of therapy. They've gone to a lot of specialists. They have been to a lot of clinic

rooms. So this group of children, the first visit, what I do is I teach the parents some tests like single leg raising and heel to toe. So they would actually assess this child at home and send me a video. That's the first thing. The second is to have interactive rooms. So when this kids goes to the occupational therapy or rehabilitation unit, these units are made very child friendly.

They're very happy going there, playing games. So in the midst of them being really happy and excited, you can actually perform some tests. But the drawback here is performing objective tests. That has definitely been a challenge and they have to visit a couple of times. So if it's a hearing assessment, they have to be sedated. So when they're sedated for an auditory brain stem response, I would actually perform a cVEMP together. You can't perform an open. So yeah, it's just to modify the test. But I must say it's definitely a challenge performing vestibular function in this group of childrens.

- Okay, thank you very much, Dr. Jeya. One more question from Turkey. First of all, thank you very much for the presentation. Thank you.

- Thank you.

- Dr. Jeya, have you ever come across tinnitus in children with a vestibular problem? How often if the answer is yes, of course?

- Yes. So yes, yes. I have come across children with tinnitus. You can actually ask questions like, do you hear some sound inside your ears? So I tell them to shut their ears and I say, can you hear something inside? And then ask them to show me what sort of sound do you hear? Is it like ringing or you know? But getting history on tinnitus the first, of course, if it's the adults and teenagers, that's not a problem, but the younger ones. But in children above five, it's definitely possible. And in toddlers, those with otitis media effusion, they may present with tinnitus as well, so yeah. And I've had

a child with sudden sensorineural hearing loss with dizziness, and this child presented with tinnitus as well.

- Okay, fantastic. So our attendees keep saying congratulations for the presentation and so forth. Can I get the recording? Of course. Okay. Other question. Other question. So at your center, what type of vestibular impairment did you find in sensory processing disorders?

- Okay, so if you're talking about sensory processing disorder, I group child with isolated language delay as a part of sensory processing disorder. There are kids who just comes in with hyperacusis or hypoacusis, and it's got nothing to do with autistic. So it's those isolated features that they have that I think has a relation with vestibular function. So I tend to quantify them objectively to learn more and to understand more. So if they do have a delay, so I teach them the vestibular exercises and follow them up. So if you're gonna ask me what is the outcome in this group of children, I'm sorry because we are still collecting the data and they're still being followed up.

But I would love to share because I think it's something very interesting, and it's something that you're seeing very commonly. It's those isolated sensory problem. They may not like too loud sounds, too soft sounds and some problem with language, some problem with sensory touch. So it's those isolated and it doesn't fall into any group of either ADHD or autism.

- Fantastic. We can share the data of your research maybe in a next Academia webinar, Dr. Jeya. What do you think? So one last question for the moment, can you please explain how does acute otitis media cause vestibular symptoms? So the relation between otitis media and vestibular symptoms.

- So this is something that when I started off, I was curious myself because I have been a pediatrics ENT specialist and I have been managing otitis media effusion for a long time, and I have never once thought of assessing their vestibular or balance function. So how this happens is when there is an effusion, there is fluid. There may be some form of toxin and this may form a serious labyrinthitis which may cause vestibular impairment. And you know, because it's the fluid is within the middle ear, the pressure changes may be transferred to the vestibular 'cause they share the same internal impairment. So this may translate to the vestibular impairment. And there has been quite a number of research papers that has actually shown that children with otitis media effusion has a vestibular delay.

- Fantastic, thank you. So no more questions from the audience. Okay.

- Well, I think anytime if anybody wants to ask any questions, you've got my email here. You can just send me an email and I'll try my best to reply.

- Dr. Jeya email is here on the screen. Please take note . Okay, let me check one more time. Okay, that's fine. So I just want to thank you, Dr. Jeya, once again for your fantastic presentation. And we really hope to have you as a speaker in the near future for Inventis Academia. We will be honored to have you as a main speaker for us.

- Thank you. Thank you so much. Thank you so much for having me, Anna. I've been really glad to be given this opportunity to share.

- You're always welcome, Dr. Jeya, believe me, believe me. Next appointment with Academia for Balance has been scheduled for next April 6th, Professor Dasgupta. Okay. Dr. Jeya, an old friend of Dr. Jeya will be with us again and he will manage the seminar Audiovestibular complications and the legalities following head injuries. So keep checking Inventis social pages and register for future event promoted by Inventis

Academia. Remember you will receive a soon survey. I kindly ask you to fill out. The survey will help us to understand your needs and to get your suggestions. Thank you, Dr. Jeya, once again.

- Thank you.

- Thank you all and bye for now. Bye.