

Differential diagnosis of vertigo and tinnitus/PGS (VPL)

Vertigo

Vertigo is a feeling of disturbed balance. It is a very common symptom in practice. It occurs in 45% of patients older than 75 years. The etiology is diverse. Patients also describe various forms of nausea as "dizziness", so a careful medical history is required.

Diagnostics

Vertigo classification:

- **systematic** - with a component of direction (vestibular cause is probable) - feeling of loss of balance, feeling like in an elevator, spinning, a tendency to fall to one side;
- **non-systematic** - without directional component (various etiologies) - uncertainty, feeling of intoxication, spinning and staggering, darkness before the eyes, feeling drunk.

Medical history

We need to determine the duration, recurrence, dependence on position (orthostatic vertigo), benign paroxysmal vertigo when changing position with loss of consciousness (diff. dg. of syncope), transient ischemic attack, reversible ischemic neurological deficit, dizziness during exercise or walking upstairs (susp. heart failure), headache (migraine), trauma, tumor, cervicogenic dizziness, dizziness after food (postprandial hypotension), concomitant illness (cardiac, hypertension, pacemaker defect), depending on head movements, e.g. when looking up (vertebrobasilar insufficiency, benign paroxysmal positional dizziness), together with tinnitus and hearing impairment (in Meniere's disease), with ear pain, ev. with ear discharge (in chronic otitis media), or in mastoiditis, vertigo worsen by cold (e.g., eardrum perforation, st. p. ear surgery), due to alcohol, drugs, harmful substances, st. p. head injuries, the effect of closing the eyes (if it disappears when closing the eyes - ophthalmic etiology).

Physical examination

- **Internal** (blood pressure measurement, arrhythmias, cardiac diseases, carotid murmurs, anaemia, orthostatic dysregulation: Schellong's test).
- **Neurological** (examination of cerebellar symptomatology, sensitive polyneuropathy with loss of position perception, lesions of the cranial nerves - nervus trigeminus or nervus facialis, indicating a pathologic process in the cerebellopontine angle of the pons):
 - **examination of gait** - falling to one side (fall to the affected side - **vestibular** causes, to the healthy side - **cerebellar** causes), walking with a broad base (side-neutral tendency to fall - **cerebellar or sensitive ataxia**);
 - **Romberg test** - positive (in **proprioceptive and sensitive ataxia**), negative (in **cerebellar** vertigo);
 - **Unterberger gait test** - positive (for **cerebellar and vestibular defects**).
- **Nystagmus** (**vestibular** - in one direction, it wears out, never vertical; **central** - complex, changing direction, could be vertical, does not wear out).
- **Examination of the ear by an otoscope** (herpes zoster oticus, otitis media, perforation), **examination of the hearing** (unilateral deafness, vestibular etiology usually).

Additional diagnostics

- **ECG** - ev. Holter examination (in suspected arrhythmias);
- **laboratory tests** - complete blood count, glycemia, creatinine, liver function tests, event. basal TSH (it is not necessary to test all this in a specifically targeted examination);
- event. send to an *ENT specialist*, neurologist, ophthalmologist, orthopedist.

Differential diagnosis of vertigo

1. **Internal causes:**

- **decreased cardiac output** (in cases of cardiac arrhythmias, heart failure, ischemic heart disease, cardiomyopathies, mechanical obstruction in the bloodstream, such as aortic stenosis, loss of circulating blood volume, diarrhea or bleeding);
- **hypertension or hypotension** (e.g. in orthostatic dysregulation);
- **cerebral circulatory disorder** (dehydration, increased blood viscosity (with the microcirculatory disorder), hypoxemia (e.g. due to hyperventilation syndrome), anaemia);
- **metabolic disorders** (hypoglycemic or hyperglycemic precoma state, thyrotoxic crisis, uremia);
- **infection** (flu-like disease, scarlet fever, rubella, measles, mumps, febrile infection).

2. **Otological etiology:**

- **vestibular neuritis** (unilateral vestibular deficit with acute rotational vertigo, vegetatively accompanied by - vomiting, increased tendency to fall, spontaneous rotational nystagmus, and feeling sick, lasts for

weeks and slowly recedes, there is no hearing impairment at all) - Therapy is necessary only in severe nausea due to irritation and feeling like vomiting, then we prescribe antivertiginosis (such as dimenhydrinate supp. **100 mg 1-2 times a day (in the Czech Republic thiethylperazine supp. is more common), from the 3rd-day positioning exercises are advised (so-called "gymnastics of the labyrinth")**)

- **benign paroxysmal positional vertigo** (acute, persistent attacks of rotational vertigo, which are caused by a certain posture of the head, nystagmus leads to the ear that is positioned lower, otherwise there is a neurological finding without deviations) - It is caused by cupulolithiasis (idiopathic or posttraumatic). - Therapy consists of position training. - Spontaneous remission occurs after a few months, positioning exercises accelerate remission.
- **Ménier's disease** (repeated attacks of dizziness for several hours, which are always accompanied by tinnitus, feeling of pressure in the ear, hearing loss due to impairment of the inner ear (at the beginning of the attack, later also during the attack), usually vomiting is present, with spontaneous nystagmus and a tendency to fall in a certain direction) - Diff. dg.: distinguish mere hearing loss (vertigo not present). - Therapy: bed rest during the attack, pharmaceuticals - antivertiginosis (dimenhydrinate supp. 100 mg 1-2 times a day, in the Czech Republic only in a form of pills, although thiethylperazine supp. is more common) And in the meantime betahistine the first 3 weeks 3×16 mg and then 3×8 mg for 2-6 months.
- **Kinetosis** Therapy: dimenhydrinate, event. scopolamine (considered inappropriate in the Czech Republic).
- **Ototoxic substances** (aminoglycosides, atropine, barbiturates, chinidine, salicylates, alcohol, CO in very heavy smokers, metals such as arsenic, lead, mercury, silver, iodine, benzene, toluene, hydrogen sulfide, toxic substances in meat and fungal poisoning).

3. Neurological etiology:

- **posterior spinal cord lesions;**
- **brainstem or cerebellar** damage (CMP, brain tumor, etc.);
- **cerebellopontine angle syndrome in acoustic neurinoma** (benign slow-growing tumor from Schwann cells creating the myelin sheath of the vestibulocochlear nerve, occurring mainly in the 4th-5th decade of life) - Tinnitus with progressive hearing loss and balance disorders is present, disorders of the innervation of the trigeminal nerve (decreased corneal reflex) and paresis of the facial nerve, later pyramidal symptoms and signs of intracranial hypertension are added. - Therapy - surgery at neurosurgery department! - CAVE: this may be a partial manifestation of a generalized form of neurofibromatosis (Morbus Recklinghausen);
- **multiple sclerosis** (synonym = **sclerosis multiplex**);
- **epileptic seizures** - characteristics of a seizure.

4. Ophthalmological etiology:

- **refractive errors** (dizziness from the beginning of the use of new glasses, with a refractive difference >3 diopters, after unilateral cataract surgery);
- after **alcohol consumption**, st. p. **craniocerebral trauma, fatigue, latent strabismus;**
- **eye muscle disorders** (innervation by nerves III, IV, VI) - in the elderly patients, e.g. in circulatory disorders, in diabetes mellitus, in hypertensive patients, myasthenia gravis, in multiple sclerosis (internuclear ophthalmoplegia), in tumors, in increased intracranial pressure;
- **an acute attack of glaucoma** - severe pain + hard bulb of the eye + red eye.

5. Reflex origin (susp.):

- in **pseudoradicular syndrome** of the C-spine;
- in **C-spine blockade**.

6. Psychogenic dizziness:

- is a very common - up to 30% - "loss of support like at the edge of an abyss";
- overlaps with a functional disorder of blood pressure regulation.

Therapy - principles

Initiation of causal therapy according to the underlying disease. Vertigo in elderly patients (etiol. hypoperfusion of the brain) occurs during dehydration - increased fluid intake should be administered (rehydrate). In orthostatic dysregulation - morning cold shower (to stimulate blood circulation), classic Kneipp treatment (physiotherapy - special hydrotherapy, exercise therapy, phytotherapy, ... to strengthen the body in general), sports, morning coffee before getting up, possibly also farmaceuticals - e.g. etilefrine 1×25 mg daily (not registered in the Czech Republic - more common is the use of *Gutron*).

Positional gymnastics

It is a releasing maneuver (so-called Semont's maneuver) in case of positional vertigo. Benign paroxysmal positional vertigo (from the vestibular apparatus) manifests itself as dizziness which is lasting a few seconds or minutes after lying down, when lying down or when changing position. A professional ENT examination and therapy with position training will be performed. The prognosis is favorable - spontaneous remission, when exercising without avoiding movement remission is accelerated. Right side: turn the head to the left by 45° while sitting in the middle of the bed (legs suspended freely from the bed) - lie down on the side (on both sides) as quickly as possible, maintaining the inclination of the head. The released otoliths will get out of the location where they irritated the vestibular apparatus by inertia.

Meniere's disease

Endolymphatic hydrops leads to *mixing of perilymph and endolymph* - **with consequent loss of function of the vestibular apparatus** - balance and hearing. It is manifested by an attack of **rotational vertigo** with **hearing impairment** and **tinnitus** (typical trias) lasting several minutes to hours. Usually, **spontaneous**

nystagmus to the side of the affected ear is present and usually **vomiting**.

Send to the ENT specialist and further according to him:

- **bed rest, antiemetics, antivertiginosis.**
- In case of severe vomiting infusion should be applied and **betahistidine**;
- in case of numerous seizures and resistance to therapy, **surgery** is recommended: saculotomy, labyrinth short circuit event. vestibular nerve neurectomy).

As prevention, a diet limited by salt and fluids is recommended. Avoiding triggers - stress, alcohol, and nicotine, and preventively patient takes betahistidine pills p.o. 3 times a day.

 *For more information see Menier's disease.*

Tinnitus

Inclusion

It is one of the **diseases of the inner ear**.

Classification of inner ear diseases:

- Cochlear hearing impairment;
 - sudden hearing loss;
 - presbycusis;
 - noise damage (acoustic trauma);
 - **tinnitus** (tinnitus).
- Vestibular apparatus:
 - vestibular neuropathy;
 - benign paroxysmal positional vertigo;
 - Meniere's disease.
- Inflammation of the inner ear - labyrinthitis.
- Toxic damage of the inner ear.
- Inner ear injury:
 - commotion labyrinthi;
 - round window membrane rupture.

Clinical picture

The clinical picture is individual and very **variable**.

We describe tinnitus

- **by type** (such as rustling, hissing, growling, cracking, whistling, ringing),
- **according to duration** (as permanent or seizure-like) and
- **according to the character** (as uniform or pulsatile).

Diagnostics

After determining the basic diagnosis of tinnitus we will send the patient to an ENT specialist.

Differential diagnostics

- Secretory otitis.
- Sudden hearing impairment.
- Meniere's disease.
- Acoustic neurinoma - Schwannoma of the n.VIII.
- Vestibrocochlear syndrome.
- Angioma.
- Anaemia.

Therapy

- **Therapy according to the underlying disease.**
- In idiopathic tinnitus and therapeutic resistance, we indicate the patient to the **cognitive-behavioral therapy** after 6 months from the beginning of treatment.
- Phytotherapy - **Ginkgo biloba**.

References

Related articles

- Vertigo

- Vertigo/PGS/diagnostics
- Vertigo/PGS (VPL)
- Tinnitus
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Sources

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