# CLINICAL PRESENTATIONS OF THE MOST COMMON VESTIBULAR DISORDERS

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*Dr Snezana Andric Filipovic*

*ENT Specialist, Consultant Audiology/Phoniatry*

*MDH, Malta*

# DIZZINESS

Term used to describe any subjective and/or objective sensation of distorted self motion or spatial orientation.

Term is widely used in exchange with other symptoms: unsteadiness, internal vertigo, external vertigo, floating, visual disturbance, walking on clouds, visual tilt, floating, lightheadedness, blackouts….

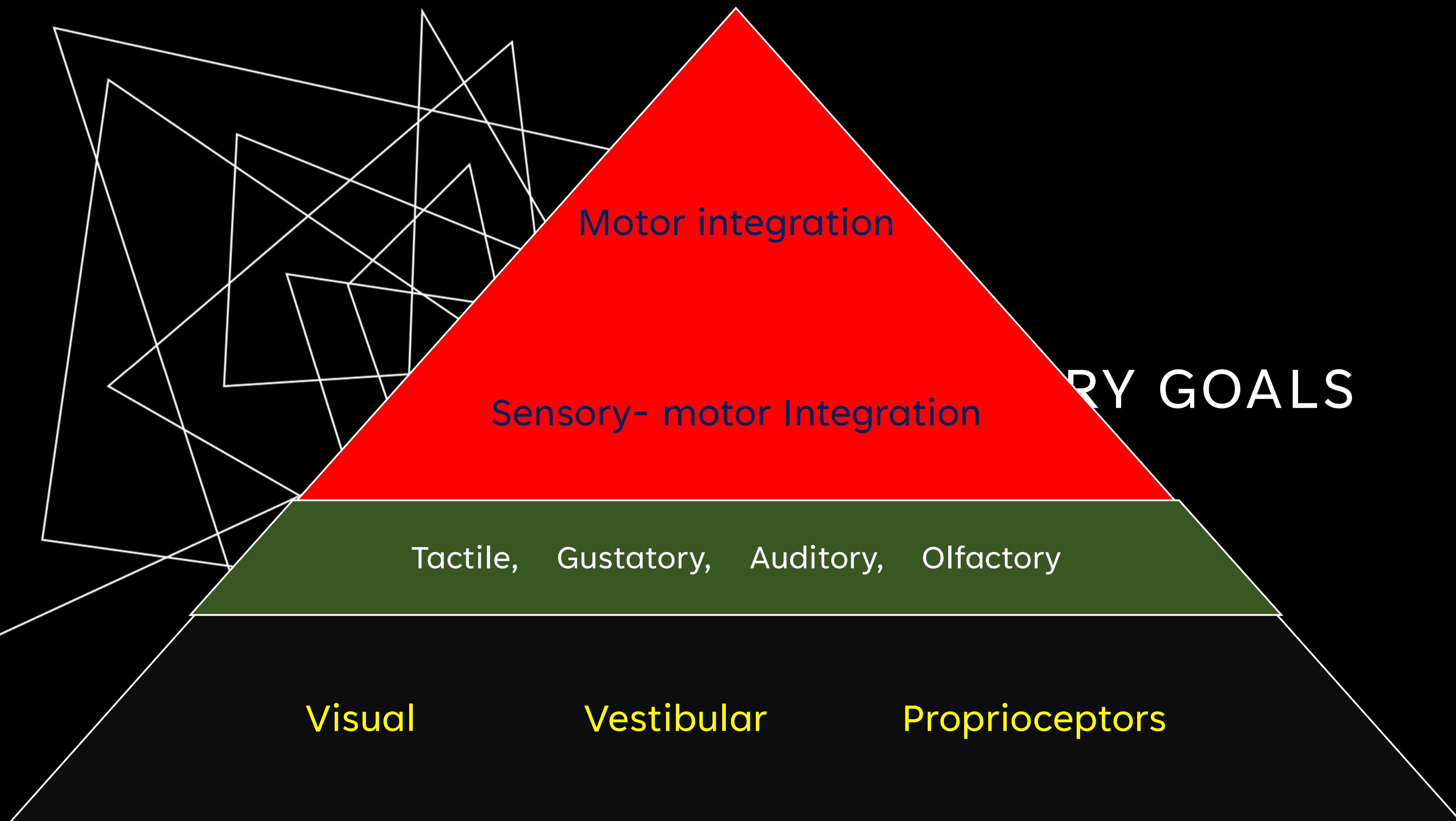
Therefore, the term dizziness does not tell us of the nature of the diseases.

# VESTIBULAR SYSTEM

Vestibular system is the centre, core, of the complex multisensory integration processes involved in keeping static and dynamic balance of an individual.

Spatial orientation and cognition are well regulated by coordination of multisensory information coming from different systems:

1. Visual,
2. Vestibular,
3. Proprioceptive,
4. Other: tactile, auditory, gustatory, olfactory,
5. Sensory motor integration,
6. Motor coordination.


Motor integration
Sensory- motor Integration
GOALS
Tactile, Gustatory, Auditory, Olfactory
Visual
Vestibular
Proprioceptors

# THE MOST COMMON VESTIBULAR DISORDERS

## CLASSIFICATION

Spontaneous
- Labyrinthitis,
- Neuritis of the superior, inferior or both vestibular nerves,
- Meniere diseases

Triggered
- BPPV
- Third window syndrome

# LABYRINTHITIS

## INFLAMMATION OF THE MEMBRANOUS LABYRINTH

1. *Acute vestibular symptoms*: spinning sensation (external or internal vertigo), nausea, vomiting, sweating;
2. *Hearing loss*, ear blockage, tinnitus, hyperacusis, misophonia;
3. *Other symptoms: Fever, URTI symptoms*

# LABYRINTHITIS

ETIOLOGY:

1. VIRAL INFECTIONS;
2. BACTERIAL INFECTIONS;
3 AUTOIMMUNE DISORDERS.

1. Primary infections
2. Secondary infections; from the ear or systemic.

Unilateral

Bilateral

# LABYRINTHITIS

## Medical emergency:

Preventing complications: meningitis, encephalitis, epidural, subdural, and brain abscesses, sepsis, facial paralyses

Reducing vestibular symptoms,

Restore hearing threshold

Restore equilibrium

## Clinical Signs:

Nystagmus;

Impaired static and dynamic balance;

Unilateral falling;

# LABYRINTHITIS

## Approach:

Blood tests: FBC, CRP, Liver profile,
Viral screen;
Blood culture;
CT/MRI;
ENT, Neurological examination
Audiovestibular examination: cVEMP, VHIT, test of the skew, and static balance.

## Treatment

*Antihistaminic: Sturgeon, Cetirizine; OR Prochlorperazine i.m. or p.o. two to three times daily;*
*Small doses of corticosteroids with long half- life; Vitamins; Antibiotics in the case of the confirmed bacterial infections;*
*Replacement of electrolytes and fluids.*
*Hospitalization and monitoring.*

# ACUTE VESTIBULAR NEURITIS

1. Superior vestibular neuritis;
2. Inferior vestibular neuritis;
3. Total vestibular neuritis.

SYMTPOMS

Sudden or gradual increase of vertigo with nausea and vomiting, very often accompanied by anxiety and increased blood pressure.

ETIOLOGY

1. Viral or bacterial affection of the nerves (influenza, parainfluenza, herpes simplex virus, Epstain-Barr, cytomegalovirus, adenovirus);
2. Ischemia of the vestibular artery;
3. Autoimmune disorders.

# ACUTE VESTIBULAR NEURITIS

## SIGNS

1.NYSTAGMUS, UNIDIRECTIONAL, BIPHASIC, FOLLOW ALEXANDER'S LAW; MAINLY HORIZONTAL-TORSIONAL DEPENDING ON THE NERVE INVOLVED;

2.SKEW DEVIATION;

3.UNILATERAL FALLING.

## EXAMINATION

Blood tests; HINT; CT/MR; ENT/Audiovestibular; Neurological and ophthalmological examination;

## AUDIOVESTIBULAR TESTS

TESTs FOR STATIC AND DYNAMIC BALANCE; Head trust tests, HINT, saccadic tests, cVEMP, oVEMP, VHIT, Caloric test.

# ACUTE VESTIBULAR NEURITIS

## TREATMENT

1. SYMPTOMATIC TREATMENT

Vestibular suppressants, antiemetics (prochlorperazine, stugeron, cetirizine);

2. SPECIFIC TREATMENT

Vasodilators, antivirals, steroids (Methylprednisolone or Dexamethasone);

3. VESTIBULAR PHYSIOTHERAPY

From several days to several weeks;

Most of the patients recover completely.

# MENIRE DIESEASE

Periodic, recurrent diseases of the inner ear with a sudden onset of vertigo, ear fullness, unilateral tinnitus, very often with nausea and vomiting.

Pathological substrate is endolymphatic hydrops (1938);

ETIOLOGY: combination of genetic and environmental factors.

CLASSIFICATION

1. Typical Meniere Disease; vestibular and cochlear part are involved;
2. Atypical Meniere diseases; only cochlear part involved;

Lopez-Escamez, Jose A. et al. 'Diagnostic Criteria for Menière's Disease'. 1 Jan. 2015 : 1 – 7.

# MENIERE DIESEASE

## DIAGNOSTIC CRITERIA

1.TWO OR MORE SPONTANEOUS EPISODES OF VERTIGO LASTING 20 MINUTES TO 12 HOURS;

2. AUDIOMETRICALLY DOCUMENTED LOW- TO MEDIUM FREQUENCY SENSORINEURAL HEARING LOSS IN ONE EAR;

3. FLUCTUATING AURAL FULNESS, TINNITUS;

4. NOT BETTER EXPLAINED BY ANOTHER VESTIBULAR DIAGNOSES.

Lopez-Escamez, Jose A. et al. 'Diagnostic Criteria for Menière's Disease'. 1 Jan. 2015 : 1 – 7.

# MENIRE DIESEASE

## DIAGNOSIS

CLINICAL SIGNS: NYSTAGMUS, UNILATERAL WEAKNESS

HEARING LOSS;

ENT EXAMINATION;

AUDIOVESTIBULAR EXAMINATION: HEAD TRUST, CVEMP, OVEMP, VHIT;

# MENIERE DIESEASE TREATMENT

| | |
|---|---|
| CONSERVATIVE TREATMENT | DIET, BETAHISTINE,DIRURETICS,LIFESTYLE CHANGES, MENIETT DEVICE; |
| INTRATYMPANIC CORTICOSTEROIDS | DEXAMETHASONE, METHYLPREDNISOLONE |
| ENDOLYMPATHIC SAC SRGERY | ENDOLYMPHATIC SAC DECOMPRESSION AND DREINAGE |
| CHEMICAL LABYRINTHECTOMY | INTRATYMPANIC GENTAMICIN |
| SURGERY | LABYRITHECTOMY |

Liu, Yupeng, Jun Yang, and Maoli Duan. "Current status on researches of Meniere's disease: a review." *Acta oto-laryngologica* 140.10 (2020): 808-812.

# BPPV
# BENIGN PAROXISMAL POSITIONAL VERTIGO

Vestibular disorder triggered by head movements.
Symptoms usually last few seconds up to two minutes;
Main symptoms are vertigo, nausea and sometimes vomiting.

## CLASSIFICATION BY ICVD (International Classification of Vestibular Disorders)

1. Canalolithiasis (otoconia are free floating in the canal);
2. Cupulolithiasis (otoconia are attached to the cupula);

## EXAMINATION AND DIAGNOSTIC CRITERIA

DIX HALLPIKE MANEUVER, PAGNINI - MCCLURE ( b-Roll test);

PRESENCE OF NYSTAGMUS AND/OR SYMPTOMS OF VERTIGO LASTING FEW SECONDS TO 2 MINUTES MAX;

HABITUATION;

# BPPV
# BENIGN PAROXISMAL POSITIONAL VERTIGO

## CLASSFICATION OF BPPV

- **PC-BPPV**, Posterior canal BPPV is the most common form of canalolithiasis (85%);
- **LC-BPPV**, lateral canal BPPV is the second common form of canalolithiasis (10-20%);
- **AC-BPPV**, Anterior canal BPPV is present only in 5% cases;
- **TRANSITIONAL BPPV**, Condition where otoconia from one canal enter another one during manoeuvres.

# BPPV
# BENIGN PAROXISMAL POSITIONAL VERTIGO

## TREATMENT
### REPOSITIONING MANOEUVRES

1. PC BPPV: EPLEY, SEMONT, GANS MANEUVER;
2. LC BPPV: BARBECUE ROLL, GUFONI, APOLONI, ZUMA-E-MAIA;
3. AC BPPV: STRAIGHT HAD HANGING TEST-ROSE, YACOVINO MANEUVER;

Nystagmus is always in the plane of the affected canal; torsional up-beating in PC-BPPV; geotropic/apogeotropic in LC-BPPV; torsional down-beating in AC BPPV.

# THIRD WINDOW SYNDROME

The Third Window syndrome is an inner ear condition where a third, mobile, window is present on the otic capsule ( normal, two windows, are oval and round). Third window usually present a place where the otic wall is dehiscent and causes changes in the sound pressure level through the perilymph/endolymph.

## Sound induced vertigo-Tulio phenomena

1. *Superior semicircular canal dehiscence;*
2. *Large aquaeductus vestibuli;*
3. *Vestibule-middle ear dehiscence;*
4. *Others*

# THIRD WINDOW SYNDROME

## SYMPTOMS

-sound induced vertigo, dizziness, oscillopsia;
-pressure induced vertigo
-tinnitus,
-hyperacusis,

## SYMPTOMS

-acute symptoms

-chronic desequilibrium

# THIRD WINDOW SYNDROME

- DIAGNOSTIC CRITERIA by ICVD

- 1. Symptoms ( least one of symptoms);
- Sound induced vertigo
- Pressure induced vertigo
- Bone hyperacusis
- 2. Signs (at least one of signs);
- nystagmus
- negative low frequency bone conduction threshold
- enhanced cVEMP test
- 3. CT confirmed dehiscence;
- 4. Not better explained by other conditions.

# THIRD WINDOW SYNDROME

## TREATMENT

1. SYMPTOMATIC TREATMENT

2. LIFE-STYLE CHANGES

3. SURGICAL TREATMENT: OCLUSION OF SUPERIOC CANAL DEHISCENCE THROGH MASTOID OR MIDDLE CRANIAL FOSSA; REPAIR OF THE FISTULA BETWEEN MIDDLE EAR AND LABRINTH.

# TRIAGE OF PATIENTS WITH THE VESTIBULAR DISORDERS

1. HEAD IMPULS TEST: positive in peripheral vestibular disorders;
2. NYSTAGMUS: unidirectional, biphasic, follow Alexander's law in peripheral disorders.
3. TILT TEST: positive in central disorders.

HINT

# Thank you

Dr Snezana Andric Filipovic
flandris@gmail.com
Tel 99112034