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COVID-19 RELATED OLFACTORY PROBLEMS PROGNOSIS AND TREATMENT OPTIONS

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Introduction/Aim: With the COVID-19 pandemic chemosensory dysfunction are among the most prevalent symptoms. Most reports are subjective evaluations, which has been suggested to be unreliable. The objective is to test chemosensory dysfunction and recovery based on extensive psychophysical tests in COVID-19 during the course of the disease.

Methods/Patients: Patients from several centers participated in the study. All tested positive for SARS-COV-2 with RT-PCR. They were tested within three days of diagnosis and 28 to 169 days after infection. Testing included extensive olfactory testing with the Sniffin' Sticks test for threshold, discrimination and identification abilities, and with the Taste Sprays and Taste Strips for gustatory function for quasi-threshold and taste identification abilities.

Results: There was a significant difference in olfactory function during and after infection. During infection 21% were anosmic, 51% hyposmic and 28% normosmic. After infection only 1% were anosmic, 26% hyposmic and 73% normosmic. 26% had gustatory dysfunction during infection and 6.5% had gustatory dysfunction after infection.

Discussion: Chemosensory dysfunction is very common in COVID-19, either as isolated smell or taste dysfunction or a combined dysfunction. Most people regain their chemosensory function within the first 28 days, but a quarter of the patients show persisting dysfunction, which should be referred to specialist smell and taste clinics for rehabilitation of chemosensory function.

Reference: COVID-19: Recovery from Chemosensory Dysfunction. A Multicentre study on Smell and Taste. Niklassen AS, Draf J, Huart C, Hintschich C, Bocksberger S, Trecca EMC, Klimek L, Le Bon SD, Altundag A, Hummel T. Laryngoscope. 2021;131:1095-1100.

ISOLATED VESTIBULAR SYNDROMES DUE TO CENTRAL LESIONS

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Introduction/Aim: Dizziness/vertigo is the most common symptoms of posterior circulation strokes. Isolated vestibular symptoms and signs without other neurologic deficits have been found in infarctions involving the brainstem and cerebellum.

Methods/Patients: This presentation would review the previous reports on isolated vestibulopathy due to central lesions, mostly ischemic strokes.

Results: In the brainstem, infarctions responsible for isolated vestibular syndrome are usually restricted to the dorsal portion that contains the vestibular nucleus and the nucleus prepositus hypoglossi. Cerebellar lesions confined to the flocculus, tonsil, and nodulus also produce isolated vertigo and imbalance. The cerebellar peduncle, as a conduit between the brainstem and cerebellum, can also produce isolated vestibular syndrome when damaged.

Discussion: Recognition of these isolated central vestibular syndromes aids in defining the function of each structure and in localizing the involved neural structures based upon the vestibular and ocular motor findings.

Reference: Kim SH, Kim HJ, Kim JS. Isolated vestibular syndromes due to brainstem and cerebellar lesions. J Neurol 2017;264(Suppl 1):S63-69. DOI: 10.1007/s00415-017-8455-6.

MILD TRAUMATIC BRAIN INJURY (MTBI)

Prof. Dr. Konstantin Trinus
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Introduction/Aim: Russian aggression against Ukraine means up to 75.000 of military stuff with mTBI after blast injury, plus up to 1.200.000 civil, Ukrainian Military and Majdan Volunteers, the figure of victims might be about 1,5 million of persons.

Methods/Patients: 87 persons being examined. Among them, ATO (AntiTerroristic Operation participants, all survived mild Blast Brain Traumatic Injury) – 51, 36 – non-ATO.

To standardize the complaints the Questionnaire "Types of Dizziness" has been used according to "International Clinical Protocol on Vestibular Disorders (Dizziness)" (https://happyvertigo.com/journal-of-neurootology/ukrainian-input-into-neurootology/). Nystagmography has documented vestibular function (Interacoustics, Denmark).

In ATO patients with moderate blast exposure, our investigation has revealed significant complaints of vestibular dysfunction: vertigo objective and subjective, drop attacks, kinetoses (significant according to F and T-tests), giddiness and descendophobia (significant according to F-test), dizziness, coordination disturbances, agoraphobia, OKN, nausea, anxiousness (T-test)

Results: Spontaneuos nystagmus in ATO 34 participants (66,67%), in not-ATO – 13 (36,11%) F-test – 0,82, T-test – 0,03.

Rightside spontaneuos nystagmus in ATO 12 (23,53%), in not-ATO –3 (08,33%) F-test – 0,096, T-test – 0,046.

Leftside spontaneuos nystagmus in ATO 27 (52,94%), in not-ATO – 8 (22,22%) F-test – 0,27, T-test – 0,0028.

Upside spontaneuos nystagmus in ATO 18 (35,29%), in not-ATO – 02 (05,56%) F-test – 1,7E-05, T-test – 0,00027.

Down spontaneuos nystagmus in ATO 14 persons (27,45%), in not-ATO – 09 (25,00%) F-test – 0,88, T-test – 0,80.

Therefore, we see subjective and objective signs of vestibular dysfunction in the blast mTBI patients. Subjective sensations are manifested with objective and subjective vertigo, drop attacks, kinetoses which are significant both with the qualitative (F-test, reveals different nosologies) and quantitative (T-test, belong to the same nosology, but with different expression levels) points of view. Additionally, giddiness and descendophobia indicate that blast trauma injury syndrome (T70.8) as nosology has its specific vestibular manifestation. While, dizziness, coordination disturbances, agoraphobia, OKN, nausea, anxiousness indicate that the patients with blast mTBI have more severe symptoms expression than ENT patients according to subjective sensations.

Objectively: spontaneuos nystagmus in ATO participants has been recorded more frequently. They mostly demostrated right and left spontaneuos nystagmus, Up directed nystagmus in ATO appeared to be especially specific.

Discussion: Conclusion: vestibular dysfunction signs have been recorded in the patients with mild and middle blast injury syndrome.

VESTIBULAR FUNCTION ASSESSMENT OF SUSAC SYNDROME PATIENTS BY THE VIDEO HEAD IMPULSE TEST AND CERVICAL VESTIBULAR-EVOKED MYOGENIC POTENTIALS

Dr. Yahav Oron, Dr. Ophir Handzel, Prof. Dr. Zohar Habot-Wilner, Dr. Keren Regev, Dr. Arnon Karni, Dr. Dina Zur, Dr. Dina Barequet, Dr. Michaella Goldstein, Prof. Dr. Ori Elkayam, Dr. Omer Ungar
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Introduction: Susac syndrome (retino-cochleo-cerebral vasculopathy, SuS) is an autoimmune endotheliopathy characterized by the clinical triad of encephalopathy, branch retinal artery occlusions and sensorineural hearing loss. In contrast to data regarding auditory function, data measuring vestibular function is sparse.

Aim: To determine whether the video head impulse test (vHIT) can serve as a confirmatory assessment of vestibulocochlear dysfunction in cases of suspected SuS.

Methods: Seven patients diagnosed with SuS underwent pure tone audiometry, a word recognition test, cervical vestibular-evoked myogenic potentials (cVEMPs), and the v-HIT.

Results: Five patients were diagnosed with definite SuS, and two with probable SuS. Two patients were asymptomatic for hearing loss or tinnitus, and no sensorineural hearing loss was detected by audiograms. Four patients complained of tinnitus, and three patients reported experiencing vertigo. Three patients had abnormal cVEMPs results. All seven patients' vHIT results were normal, except for patient #2, who was one of the three who complained of vertigo. The calculated gain of her left anterior semicircular canal was 0.5, without saccades.

Discussion: This is the first study to describe the results of the vHIT and cVEMPs among a group of patients with SuS. The results suggest that the vHIT should not be the only exam used to assess the function of the vestibular system of SuS patients.

NYSTAGMUS IN NOSE DOWN POSITION IS USEFUL TO DETERMINE THE AFFECTED EAR OF CUPULOLITHIASIS IN LATERAL SEMICIRCULAR CANAL

Dr. SachikoKoitabashi
Matsuida Hospital, Annaka, Japan

Aim: Identifying the affected side is critical for the successful treatment for benign paroxysmal positional vertigo. The affected ear of the cupulolithiasis in lateral semicircular canal (LSC) can be determined according to the following 3 signs. 1. Nystagmus in the supine position is directed to the affected ear. 2. The side of the less intense positional nystagmus indicates the affected ear. 3. Nystagmus in the nose down position (head bent 90 degrees forward) is directed to the healthy ear.

We investigated which sign might be most useful in practice.

Method: Material was the 19 (male 8, female 11, average age 71 years old) patients of cupulolithiasis of LSC, who visited our clinic in 2019-2020 in which the affected side was certified after the success of repositioning therapy.

Results: The nystagmus in supine position was directed to the affected ear in 7 patients (37%). The positional nystagmus was less intense when the affected ear was down in 9 patients (47%). In nose down position nystagmus appeared in all 19 patients which was directed to the healthy ear without exception (100%).

Therefore, we concluded the nystagmus in nose down position is most useful to determine the affected ear in cupulolithiasis in LSC.

Discussion: The nystagmus in supine position was often unstable. The comparison of intensity of nystagmus in right/left side lying position was sometimes difficult to determine without electronystagmography. The nystagmus in nose down position is easy to detect with Frenzel's glasses, thus the method is useful in office clinic.

Reference: "Bow and lean test" to determine the affected ear of horizontal canal benign paroxysmal positional vertigo. Laryngoscope 116: 1776-1771,2006

TWO CASES OF PERSISTENT POSTURAL PERCEPTUAL DIZZINESS (PPPD) IMPROVED WITH A COMBINATION OF VESTIBULAR REHABILITATION AND SULPIRIDE

Dr. Sachiko Koitabashi
Matuida Hospital, Annaka, Japan

Aim: To suggest the effective treatment for PPPD.

Patients: Case 1 was a 60 years old woman. Her chief complaint was continuous sensation of dizziness exacerbated by her own movement and looking at moving objects. Her symptoms started one and half years before her visit. On her first visit, the score of the questionnaire for PPPD was 42 (full score 72) and severe. She was treated with a combination of vestibular rehabilitation and sulpiride. Two months later her symptom improved and her PPPD score has reduced to 34.

Case 2 was a 70 years old woman with the same symptom, which started 8 months before her visit. The score of the PPPD questionnaire was 34. Three months after the treatment of vestibular rehabilitation and sulpiride, her symptom has improved and her PPPD sore has reduced to 16.

Results: A combination of vestibular rehabilitation and sulpiride was effective for the patients with PPPD.

Discussion: PPPD was defined in 2017 by the International Society for Neuro-otology. According to the definition, the disease is long lasting (more than 3 months), preceded by acute vestibular disorders, and exacerbated by visual stimulation and/or her or his own movement.

As treatments with SSRI, vestibular rehabilitation and cognitive-behavioral therapy were reported to be effective.

We chose sulpiride for our patients instead of SSRI, because, the patients had weak stomach and we aimed at early onset of effectiveness.

Reference: Diagnostic criteria for persistent postual-perceptual dizziness (PPPD):Consensus document of the committee for the classification of vestibular disorders of the Barany Society. Journal of vestibular research 27(2017)191-208.

A validated questionnaire to assess the severity of persistent postural-perceptual dizziness (PPPD): The Niigata PPPD Questionnaire (NPQ). Otol Neurotol 40:e747-e752,2019

CLINICAL TREATMENT OF MÉNIÈRE'S DISEASE

Prof. Dr. Fernando Ganança, Prof. Dr Maurício Ganança
Federal University of Sao Paulo, São Paulo, Brazil

The experience of Neurotological division of Federal University of São Paulo in treating Menière's disease clinically will be presented. Discussion about the most appropriate and effective drugs and other treatment options to be administered according to the phase of the disease (crisis, post crisis, intercrisis and recovery periods) will be exposed as well. Clinical treatment of Menière's disease associated to other common vestibular diseases will be also included at this presentation.

MANAGEMENT OF MÉNIÉRE'S DISEASE. WHAT? WHEN? WHY?

Dr. Ágnes Szirma Phd
Semmelweis University, Fül-orr-gégészeti és Fej-nyaksebészeti Klinika, Budapest, Hungary

Introduction/Aim: Ménière disease (MD) is a disorder of the inner ear, with hallmark symptoms consisting of spontaneous and episodic vertigo, unilateral sensorineural hearing loss (SNHL), tinnitus, and aural fullness. The presentation of MD can be highly variable between patients. Since the improvement of these symptoms exerts influence over the patients' quality of life and the condition seems to be incurable, the symptomatic conservative treatment suggests an important question.

The diagnosis of the MD is based on the case history, audiological and vestibular tests, and exclusion of other diseases. The management is the control examination of the patients with appointments in every 3-6 months. The aim of these appointments in not the diagnosis revision, but the symptom oriented approach of the MD.

Methods/Patients: The detailed talk about the patients' symptoms, about problems in everyday life (attacks, fullness of the ear, disturbing tinnitus, hearing loss) can be combined with questionnaire and the analysis of vertigo diary. DHI (Dizziness Handicap Inventory) is the most useful questionnaire to analyze the vertigo-related quality of life. In several cases we use the Tinnitus Handicap Inventory Questionnaire as well. We can recognize the concomitant anxiety disorder and depression. The examination of the vestibular system includes spontaneous nystagmus examination, Romberg and Unterberger-Fukuda test- we can see the increasing imbalance in advanced MD. Positional nystagmus examination is important, secondary BPPV associated to MD could be seen. Pure tone audiometry and tinnitometry is also important in controlling of the cochlear symptoms.

Results: Based on the international consensus of MD treatment the basic treatment is the medical treatment, betahistin. We have to find the optimal dose based on the data of the vertigo diary for the control of attacks. Salt restriction seems to be important. Diuretics are very useful in the decreasing of aural fullness. Intratympanal dexametasone can improve the hearing, and can decrease the tinnitus. Psychological and/or psychiatric treatment could decrease the tinnitus, and the anxiety disorder. The imbalance in advanced MD could be managed with assisted vestibular training.

In the therapy resistant cases we could offer the minimal invasive methods, like Grommet insertion, tensor tympany and stapedial muscle tenotomy, endolymphatic sac surgery.

In cases of severe hearing loss we can decide about the chemical labyrinthectomy (gentamycine) together with the patient. When the hearing loss is disturbing, we can fit a hearing aid but this is a great challenge for the audiologist because of the recruitment, the aural fullness, and the Tullio phenomenon, and the small dynamic range of the ear.

The symptom –oriented management can improve the quality of life of the MD patients.

COVID-19 RELATED OLFACTORY PROBLEMS.

Dr. Thomas Hummel
Dept. of ORL, TU dresden, Dresden, Germany

Introduction/Aim: With the COVID-19 pandemic chemosensory dysfunction are among the most prevalent symptoms. Most reports are subjective evaluations, which has been suggested to be unreliable. The objective is to test chemosensory dysfunction and recovery based on extensive psychophysical tests in COVID-19 during the course of the disease.

Methods/Patients: 111 patients from four centres participated in the study. All tested positive for SARS-COV-2 with RT-PCR. They were tested within three days of diagnosis and 28 to 169 days after infection. Testing included extensive olfactory testing with the Sniffin' Sticks test for threshold, discrimination and identification abilities, and with the Taste Sprays and Taste Strips for gustatory function for quasi-threshold and taste identification abilities.

Results: There was a significant difference in olfactory function during and after infection. During infection 21% were anosmic, 51% hyposmic and 28% normosmic. After infection only 1% were anosmic, 26% hyposmic and 73% normosmic. For gustatory function there was a difference for all taste qualities, but significantly in sour, bitter and total score. 26% had gustatory dysfunction during infection and 6.5% had gustatory dysfunction after infection. Combining all tests 22% had combined olfactory and gustatory dysfunction during infection. After infection no patients had combined dysfunction.

Discussion: Chemosensory dysfunction is very common in COVID-19, either as isolated smell or taste dysfunction or a combined dysfunction. Most people regain their chemosensory function within the first 28 days, but a quarter of the patients show persisting dysfunction, which should be referred to specialist smell and taste clinics for rehabilitation of chemosensory function.

Reference: Niklassen, A.S., Draf, J., Huart, C., Hintschich, C., Bocksberger, S., Trecca, E.M.C., Klimek, L., Le Bon, S.D., Altundag, A. & Hummel, T. (2021) COVID-19: Recovery from chemosensory dysfunction. A multicentre study on smell and taste. Laryngoscope 2021;131(5):1095-1100

SCIENCE OF SENSATION; SENSOLOGY ; AND TINNITUS

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Goal: an integrated understanding of the state of the art of Interoception and their regulation has been cited to have application to multiple disease states. Its clinical application(s) suggested For tinnitus theory, diagnosis, and treatment are considered significant.

Methods/Patients: Conventional definitions of Exteroception and Interoception are categories of classification for sensations.

Results: Exteroception is a term for a sensation(s), evoked from a stimulus originating in the external environment, limited to the body soma. Interoception is a term for a sensation (s), evoked from a stimulus originating within the body with extension to and from the brain, and to other organs, which in turn modulate internal body signals sent back to brain.

Discussion: Recent advances in Interoception are suggested to have significant clinical implications for tinnitus, theory, diagnosis and treatment - particularly for the severe disabling, predominantly central clinical type subjective idiopathic tinnitus (SIT). Objective electrophysiologic demonstration of Interoception information in the context of the cognitive emotional behavioral component of the SIT is presented based upon EEG based brain function imaging data, Quantitative electroencephalography (QEEG)/standard Low resolution brain electromagnetic tomographic analysis (LORETA)..

Reference: Key Words : Sensation Perception Sensory systems Science of Sensations Sensology QEEG/sLORETA

TELEMEDICINE FOR DIZZY PATIENTS IN A PANDEMIC: RETURN OF THE HOUSE CALL

Prof. Dr. David Zee
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Telemedicine is here to stay but it cannot be successful without the traditionally trained, skillful, bedside clinician, making an old-fashioned “House Call”.

More than ever, we need to mix a classical knowledge of anatomy and physiology with an understanding of modern-day technology in order to

1. Quickly make sense out of the symptoms of a dizzy patient
2. Develop a plausible differential diagnosis
3. Perform a targeted, focused, economical, believable, remote examination
4. Prescribe a safe, practical plan for further evaluation and treatment
5. Interpret modern-day vestibular function tests as VOG (video-oculography)

OUR ROADMAP

1. What physiology and anatomy must we know? Homage to the 19th century masters.
2. The focused history: What should we be asking?
3. The remote ’bedside’ exam; HINTS stroke algorithm at a distance,
4. Do I tell my acutely dizzy patient: “wait it out”, or “come to the ED now!”?
5. The new technology -- Video Oculography (VOG) in the ED. Do I believe the VOG report?

VESTIBULAR FUNCTION AND HUMAN FUNCTIONAL ABILITY: THE MISSING LINK

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Introduction/Aim: Central regulation of vestibular adaptation mechanisms are not yet adequately understood even though the vestibular system is an innate mechanism for gaze and gait abilities. Current vestibular rehabilitation programs are limited in their effectiveness due to the lack of scientific understanding of the adaptation mechanism.

Methods/Patients: Healthy participants, Unilateral vestibular loss patients, Bilateral vestibular loss patients. Review of recent literature.

Results: Based on number of different vestibular adaptation methods (i.e. incremental vestibulo-ocular reflex (VOR) adaptation; electrical stimulation for vestibular re-sensation) we can claim that the physiological changes are relatively small whereas the individuals' functional improvements are substantial.

Discussion: This discrepancy indicates the need for 1) greater understanding of the brain mechanisms governing vestibular adaptation; 2) to determine why this pronounced physiological-behavioral-functional gap exists; and 3) identification of methods to enhance vestibular adaptation which increase the physiological changes and narrow this gap.

The human vestibular system is exquisitely sensitive to detect linear and rotational head acceleration signals, processed in the brainstem and subsequently generate compensatory eye rotations. This vestibulo-ocular reflex ensures clear and stable vision during head rotation, enabling humans on the move to keep gaze on their desired target. Data from recent studies on healthy subjects and vestibular patients will be presented demonstrating the incredibly plastic VOR, on one hand. On the other hand, the methods used in these studies highlight a gap in physiological-behavioral-functional recovery that persists despite these advanced adaptation techniques. Vestibular adaptation mechanisms are important scientific enigmas and solving them will both improve clinical practice and enhance quality of life.

THE IMPACT OF DISEASE DURATION IN PERSISTENT POSTURAL-PERCEPTUAL DIZZINESS (PPPD) ON THE QUALITY OF LIFE, DIZZINESS HANDICAP AND MENTAL HEALTH

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Introduction/Aim: Persistent Postural-Perceptual Dizziness (PPPD) is a chronic functional vestibular disorder which interferes with the way individuals experience their personal, social and work life.

Methods/Patients: A prospective study comparing the EQ-5D for QOL, Dizziness Handicap Inventory (DHI) and DASS-21 between patients with PPPD and those who have recovered from an acute vestibular event was performed. Similar parameters between PPPD patients with symptoms less than one year and more than a year were compared to study the effects of disease duration.

Results: The PPPD patients were predominantly females and middle-aged with significantly higher DHI scores (mean 48.3+ 25.7, p =.00002), higher total mean scores in the DASS-21 (mean 21.6+13.7, p= .009) and poorer QOL with mean EQ-5D VAS of 67.9+17.3 (p <.00001). PPPD patients with symptoms for more than a year had significant increase in physical handicap (p = .041) as well as anxiety levels (p = .008).

Discussion: Persistent postural-perceptual dizziness in our population is similar to published data of predominantly seen in females and middle-aged which significantly reduces the quality of life, increases dizziness handicap and increases depression, anxiety and stress levels.

While it is now established that anxiety mood is not a core PPPD symptom but predisposes one to it, our findings support the notion that chronicity of PPPD symptoms worsens the mental health especially anxiety. This may lock the PPPD patient in a vicious never-ending cycle where having anxiety predisposes one to PPPD and PPPD worsens the anxiety. Hence, it is important to diagnose and begin therapy early to break the cycle.

PSYCHIATRIC COMORBIDITY IN PATIENTS WITH TINNITUS OR AUDITORY HALLUCINATION AND SOUND THERAPY

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Introduction/Aim: We reported psychiatric comorbidity (965/1367, 70.6%) in patients with dizziness. In this study, we investigated about tinnitus or auditory hallucination.

Methods/Patients: The subjects were 342 patients (138 men, 204 women) with tinnitus and 24 patients (8 men, 16 women) with auditory hallucination. Patients were diagnosed using ICD-10. AhHI (Auditory hallucination Handicup Inventory), which is a revised version of THI, was used as an evaluation method for auditory hallucinations.

Results: Psychiatric comorbidity was revealed in 264 (77.2%) with tinnitus. Of 264 patients, various types of Psychiatric disorders (D) were found, such as anxiety or panic D (F41) in 123 (46.6%), mood D (F3) in 67 (25.4%), adjustment D or post-traumatic stress D (F43) in 17 (6.4%), other neurotic D (F48) in 14 (5.3%), organic mental D (F0) in 19 (7.2%) and schizophrenia (F2) in 10 (3.8%). Twenty-four patients with auditory hallucination suffered from schizophrenia in 21 cases, dementia in 2 cases and mood D in 1 case. As a treatment for auditory hallucination, sound therapy, oral antipsychotic drug and long-acting injection (LAI) were effective.

Discussion: We believe that collaboration between psychiatrists and otolaryngologists in the hospital and/or doctors in local area can improve the mental condition and the quality of life of patients who are suffering from tinnitus or dizziness with psychiatric comorbidity.

Reference:

1. Ogawa KPathophysiology and its central control of auditory abnormalities feeling. (Keio Univ.) Tokyo, SPIO print, 1-335, 2013

2. Kaneko Y, Oda Y, Goto F: Two cases of intractable auditory hallucination successfully treated with sound therapy Int Tinnitus J. 16(1):29-31, 2010

GENOTYPES AND CLINICAL PHENOTYPES OF P.V37I MUTATION

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Introduction/Aim: To analyze the clinical audiological characteristics of children with mutations at the p.V37I (c.109G>A) locus of the GJB2 gene, to explore the clinical significance of heterozygous mutations in p.V37I, and to provide a clinical basis for genetic counseling.

Methods/Patients: The study population was 41 children with confirmed c.235delC/p.V37I, c.299delAT/ p.V37I and c.176del16/p.V37I compound heterozygous mutations who attended our pediatric hearing diagnostic center from 2012 to 2018. All children underwent newborn hearing screening, deafness gene screening, and GJB2 gene full coding region testing; they also underwent audiometric testing for acoustic conductance resistance, aberration product otoacoustic emissions, auditory brainstem response, multifrequency steady-state evoked potentials, and pediatric behavioral audiometry.

Results: Of the 41 cases, 26 were male and 15 were female, mean age at first diagnosis: 5.3 ± 4.0 months. The common genotype was c.235delC/p.V37I compound heterozygous mutation in 25 cases (61.0%). Newborn hearing screening was passed in 13 cases (31.7%) and failed in 28 cases (68.3%). Four cases passed the newborn hearing screening and were subsequently diagnosed with mild hearing loss and seven cases failed the newborn hearing screening and were subsequently diagnosed with normal hearing. Hearing diagnosis was normal in 16 cases (39.0%) and hearing loss in 25 cases (61.0%), of which, 14 cases (56.0%, 14/25) were mild and 11 cases (44.0%, 11/25) were moderate. c.235delC/p.V37I mutation children, 52.0% had hearing loss (13/25), predominantly mild. c.299delAT/ p.V37I mutant children, 77.3% (10/13) developed hearing loss, predominantly moderate.

Discussion: In our group of children with heterozygous mutation of GJB2 gene p.V37I mutation, the genotype was predominantly c.235delC/p.V37I, about 39.0% (16/41) showed normal hearing and 61.0% (25/41) showed mild-moderate hearing loss. Four children passed the newborn hearing screening and later developed hearing loss, suggesting that GJB2 gene p.V37I mutation is associated with late-onset hearing loss was associated. Children with genotype c.299delAT/ p.V37I are more likely to develop hearing loss and should be taken into account clinically.

NEWLY FOUND MUTATIONS OF SLC26A4 GENE CONSTRUCTION OF FUSION VECTOR WITH PCDNA3.1+ AND PROTEIN EXPRESSION ANALYSIS

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Department of Otolaryngology Head and Neck Surgery, Beijing Tongren Hospital, Capital Medical University, Beijing Institute of Otolaryngology, Key Lab, Beijing, China

Introduction/Aim: Based on novel SLC26A4 gene mutations c. 1211C>A and c.574delC reported in our previous studies, eukaryotic fusion expression plasmids of SLC26A4 gene and pcDNA3.1(+) vector were constructed, which would provide a research basis for exploring the pathogenicity of the novel mutations.

Methods/Patients: The wild type and mutant SLC26A4 gene (c. 1211C>A and c.574delC) and pcDNA3.1(+) were transfected into HEK293 cell line respectively. The plasmid digestion products were analysed and plasmid sequences were detected. The expression of Pendrin protein in the cell lines was observed.

Results: The eukaryotic fusion expression plasmids were successfully constructed. Both mutant plasmids and wild-type plasmids could express Pendrin protein in cells with different molecular weights.

Discussion: The wild type and mutant of SLC26A4 gene (c. 1211C>A and c.574delC) construction of fusion vector with pcDNA3.1(+) were successfully constructed and can be expressed in HEK293 cell line. The molecular weights of Pendrin protein expressed by the mutant plasmids were different from that expressed by the wild type plasmid, suggesting that the novel mutations may be pathogenic by affecting the expression of Pendrin protein.

HEARING AID FOR PATIENTS WITH DEMENTIA AND HEARING LOSS IN PSYCHIATRIC HOSPITAL

Dr. Kensuke Kiyomizu [1, 2, 3], Dr. Takeshi Nakamura [4], Prof. Dr. Tetsuya Tono [4], Dr. Hideki Funahashi [5], Prof. Dr. Yasushi Ishida [5], Dr. Kensei Yoshida [6], Dr. Sho Kanzaki [7]

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Introduction/Aim: Japan is a hyperaging society. The number of patients with dementia are increasing and might be 4.62 million people in 2012. We reported the audiometric tests (AT) in patients with dementia and the usefulness of hearing aid (HA).

Methods/Patients: The subjects were 217 patients with dementia (78 men, 139 women, age range, 61-95; mean age 80.3 years) and 91 patients with mild cognitive impairment (MCI) (38 men, 52 women). Dementia were classified as follows: Alzheimer's in 131 (60%), vascular in 17 (7.8%), Lewy Bodies (DLB) in 14 (6.5%), frontotemporal (FTD) in 32 (14.7%), mixed in 22 (10.1%), others in 1 (0.5%). We used revised Hasegawa's dementia scale (HDS-R) as a cognitive function test. The HDS-R results were classified as follows: normal and mild≥21; moderate1: 16~20; moderate2: 11~15; severe: ≤10. AT results were classified as follows: normal: pure tone average (PTA)≤25 dB; mild: 26-40dB; moderate: 41~70dB; severe: ≥71dB.

Results: Out of 217 patients with dementia, in HDS-R, 72 (33.2%) cases gave normal and mild results, 67 (30.9%) showed moderate1, 42 (19.4%) showed moderate2 and 42 (19.4%) showed severe. Bilateral AT results showed normal in 19 (8.8%) case, right hearing loss (HL) in 4 (1.8%), left HL in 4 (1.8%) and bilateral HL in 186 (85.7%). In total therefore, 194 (89.4%) had HL. The rate of continuing to wear HA was get better as follows: 7/76 (9.2%) in 2015, 23.1% (22/95) in 2016, 24.7% (25/101) in 2017, 33.3% (44/132) in 2018, 34.8% (49/141) in 2019 and 36.5% (71/194) in 2021. Out of 91 patients with MCI, 80 (87.9%) had HL and 37/80 (46.3%) continued to wear HA. The HDS-R results of most cases worsened over the years, but that of the 16 cases improved temporarily and that of the recent 9 cases improved. The rate of continuing to wear HA was very high 12/16 (75%), and the relationship with their family was very good. After COVID-19 pandemic, HA consultation day decreased (6→2 times a month), but the number of patients buying HA increased (16 in 2019→32 in 2020).

Discussion: It is important for them to detect their HL and usefulness of HA. We have to be careful for the possibility of pseudo-dementia (cognitive dysfunctions caused by HL or earwax). HL is one of the risk factors for dementia. Patients with HL are at risk of developing cognitive impairment. In this study, we have encouraged to wear HA for patients with HL not to develop their cognitive impairment. It's very good that the rate of continuing to wear HA have improved. We try to continue this intervention for a long time. We also experienced a 88-year-old man in which speech discrimination score (SDS) was less than 50% even though PTA was about 40dB. When determining the ear to be worn by a HA, it is necessary to evaluate SDS. Cognitive function tests includes three elements: 1) cognition of the sound: PTA, 2) cognition of the words: SDS and 3) poor judgment and delusions. Otolaryngologist can evaluated 1) and 2) by AT results (PTA, SDS). Therefore, we believe that Mental-hearing rehabilitation with HA is effective to preserve their cognitive function (HDS-R, MMSE).

Reference:

1) Lin FR, Yaffe K, Xia J, et al: Hearing Loss and Cognitive Decline in Older Adults. JAMA Intern Med. 173 (4), 293-9, 2013

2) Uchida Y, Sugiura S, Nishita Y, et al: Age-related hearing loss and cognitive decline - The potential mechanisms linking the two. Auris Nasus Larynx 46(1):1-9, 2019

PPPD AND VORTIOXETIN, A NEW ANTIDEPRESSANT

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Introduction/Aim: PPPD is a new chronic dizziness disease that has been introduced by the Barany Society. We already reported Sertraline: SSRI (typical antidepressant) therapy was effective for patients with chronic dizziness and depression using utilized Dizziness Handicap Inventory (DHI) questionnaire and vestibular ocular reflex tests in rotation (VOR tests) at 2019 NES in Tokyo. We also experienced SNRI or NaSSA (antidepressants) were effective for patients with PPPD. In particular, Vortioxetin (Trinterix) is a new antidepressant (S-RIM: Serotonin Reuptake Inhibitor and Modulator) with less side effects and effective well. We therefore investigated the effectiveness of Vortioxetin therapy for the patients with PPPD.

Methods/Patients: Out of 1361 patients (453 men, 907 women) (mean age, 60.5 years) with dizziness, PPPD was revealed in 219 patients (16%) (63 men, 156 women) (mean age, 58.4 years). By the way, Vortioxetin treatment performed 57 all depressive patients (with or without dizziness) and PPPD was revealed in 20 patients.

Results: Psychiatric comorbidity was revealed in 204 (93.2%) with PPPD. This number was extremely high compared to 70.4% (958/1361) of all dizziness diseases. DHI scores were improved gradually (59.7→51.1→33.6, before→1M→2M:) in 20 cases. In VOR tests, DP% scores (vestibular function) were improved significantly (21.46→6.63) in 5 cases.

Discussion: We reported the possibility that sertraline (SSRI) acts directly on the vestibular nervous system. These results of the present clinical research suggested that Vortioxetin (S-RIM) might have some effects which improved the vestibular function in patients with dizziness and depression as well as sertraline.

Reference: 1) Fujii H, Kiyomizu K, Shimogori H, et al: Selective serotonin reuptake inhibitor (SSRI) and vestibular function. Equilibrium Res 79 (1) 12-19, 2020.

2) Kiyomizu K, Torihara K, Nakayama M, Fukudome S, Sato S, Tono T: Psychiatric comorbidity in patients with dizziness. Equilibrium Res 71(2): 96-102, 2012

3) Kiyomizu K: Dizziness and Depression- Psychotropic drugs and SSRI. Equilibrium Res 73: 235-245, 2014

EXOSOMAL MIRNA LET-7B INDUCING HYPEREXCITABILITY-INDUCED AUDITORY CELL DEATH DECREASE THE AUDITORY SENSORIAL MEMORY IN CELLULAR NEURAL NETWORK

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Aim: The microRNAs (miRNAs) in cell-released exosomes can circulate with the associated vehicles to reach neighboring cells and distant cells. MiRNA let-7b play a major role to regulate cell death through the interaction with Toll-like Receptor 7 (TLR7) on cell membrane or in intracellular endosome. MiRNA let-7b play a major role to regulate cell death through the interaction with TLR7, controlling the cell excitation through TRPA1 (1) (2). Our objective is to clarify the impact of exosomal (exo-) miRNA let-7b inducing hyper excitability-induced auditory cell death to the mismatch negativity (MMN) reflecting an auditory memory traces in neural cells.

Materials and Methods: Primary Rat cortex neuronal cell cultures are prepared from embryonic day 18 (E18) Wister rat brains. The neural network of primary neural cells was estimated on the high-density CMOS (complementary meta-oxide-semiconductor)-MEAs (microelectrode arrays). The cell viability assay and western blot analysis were performed in primary neural cell after exposure of exo-miRNA let-7b. The stimulation paradigm was applied for evaluating the deviance detection (DD) as an indicator of auditory MMN in neural cells (3)(4)(5). The stimulation selectivity of DD was evaluated by stimulus-specific adaptation index (SSAI), and the spontaneous burst-firing was estimated by total spike rate (TSR).

Results: The cell viability after direct exposure of miRNA let-7b was decreased in time-dependent manner. The expression of TLR7 were increased at 24h after exposure of exo-miRNA let-7b in primary neural cells. This result indicates that exo-miRNA let-7b functions as a ligand of TLR7 in cells. Interestingly, SSAI was significantly decreased in the secondary response of DD in exo-miRNA let-7b-treated cells, and the detectability of DD giving an indication of auditory MNN was also significantly decreased. The intermittent spontaneous burst-firing was confirmed by the increase of TSR in neural circuitry after exposure of exo-miRNA let-7b. These results indicate that exo-miRNA let-7b holds the potential to decease auditory MMN and lead to the generation of the spontaneous burst-firing in neural cells (6).

Discussion: Our results suggest that exo-miRNA let-7b inducing hyperexcitability-induced auditory cell death through the interaction of TLR7 might decrease the auditory sensorial memory in cellular neural network.

References:

1. Lehmann SM, Krüger C, Park B, et al. An unconventional role for miRNA: let-7 activates Toll-like receptor 7 and causes neurodegeneration. Nat Neurosci. 2012 Jun;15(6):827-35.

2. Park CK, Xu ZZ, Berta T, et al. Extracellular microRNAs activate nociceptor neurons to elicit pain via TLR7 and TRPA1. Neuron. 2014 Apr 2;82(1):47-54.

3. Chen IW, Helmchen F, Lütcke H. Specific Early and Late Oddball-Evoked Responses in Excitatory and Inhibitory Neurons of Mouse Auditory Cortex. J Neurosci. 2015, 35:12560-73.

4. Jiang S, Yan C, Qiao Z, et al. Mismatch negativity as a potential neurobiological marker of early-stage Alzheimer disease and vascular dementia.. Neurosci Lett. 2017, 647:26-31.

OTOTOXIC EFFECTS OF DRUGS USED IN COVID-19 THERAPY IN COMPARISON TO WELL-KNOWN OTOTOXIC AGENTS CISPLATIN IN MALE WISTAR RATS

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Introduction/Aim: Many medications are under investigation as new therapies to treat COVID-19. Among them, hydroxychloroquine, azithromycin, and colchicine have been identified as potentially ototoxic molecules. The study aimed to determine if these drugs have any effect on hearing function while administered similarly to clinic protocol (route of administration, doses, and regimen schedule). A well-known ototoxic reference compound cisplatin was used for comparison.

Methods/Patients: Male Wistar rats (Janvier Labs) were randomly divided into six groups: one sham group (no treatment), three groups treated with either hydroxychloroquine (62 mg/kg, per os once a day for five days), azithromycin (51.5 mg/kg, per os once a day for five days) or colchicine (0.1 mg/kg, per os once a day for five days), one vehicle group (vehicle of cisplatin: NaCl) and one group treated with cisplatin (2 mg/kg, intraperitoneal once a day for two consecutive cycles of four days injections followed by a 10-day recovery period).

DPOAE at 4 ,8, 16, 24 and 32 kHz (F2/F1=1.2, intensity=63 dB) and ABR at 4, 8, 16, 25 and 32 kHz (from 90 to 0 dB in 10 dB steps) were measured at baseline (T0), T+10DAYS, T+24DAYS and T+38DAYS.

Results: In the hydroxychloroquine, azithromycin, and colchicine-treated groups, a significant increase of ABR thresholds was observed at least for one frequency from T+24DAYS compared to the Sham group. In the cisplatin-treated group, no significant difference in ABR thresholds was observed compared to the vehicle group. DPOAE amplitudes were decreased in the azithromycin-treated group only at 32 kHz at T+38DAYS compared to the sham group, but no difference was observed in the hydroxychloroquine and colchicine-treated groups throughout the study. In addition, no difference in DPOAE amplitude was observed in the Cisplatin group compared to the vehicle group.

Discussion: Overall, the effects of colchicine on hearing were negligible (mean loss <10 dB), suggesting that it is not ototoxic. Hearing loss observed in the groups treated with hydroxychloroquine and azithromycin was progressive and more pronounced than in the colchicine-treated group. However, the modifications of hearing acuity were slight, and the observed ABR thresholds were close to the normal hearing range. The ototoxicity of these compounds remains to be investigated in the long term. Finally, cisplatin, a well-known ototoxic compound, induced no significant hearing loss at the tested dose and treatment regimen. It can be explained by the chosen dose and/or the treatment duration.

Reference: Fernandez, K., Wafa, T., Fitzgerald, T.S., Cunningham, L.L., 2019. An optimized, clinically relevant mouse model of cisplatin-induced ototoxicity. Hearing Research 375, 66–74.

Prayuenyong, P., 2020. Clinical Implications of Chloroquine and Hydroxychloroquine Ototoxicity for COVID-19 Treatment: A Mini-Review. Frontiers in Public Health 8, 6.

Rybak, L.P., Ramkumar, V., Mukherjea, D., 2021. Ototoxicity of Non-aminoglycoside Antibiotics. Front. Neurol. 12, 652674.

Scarsi M, Piantoni S, Colombo E, et al. Association between treatment with colchicine and improved survival in a single-centre cohort of adult hospitalised patients with COVID-19 pneumonia and acute respiratory distress syndrome. Annals of the Rheumatic Diseases 2020;79:1286-1289.

MENTAL HEALTH CONSULTATION IN URBAN OTOLOGIC CLINIC

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Introduction/Aim: It is rare to have the department of Mental health at neuro-otological clinic. Thanks to Dr. Sakata in connection with NES in 2019, mental health consultation was performed at Kawagoe Otology Institute once a month. We report about the patients with otological disorders (dizziness, tinnitus and hearing loss) and psychiatric comorbidity.

Methods/Patients: Table shows the number of patients. It took about 10 hours to travel over 1000km from Nobeoka City, Miyazaki Prefecture (countryside) to Kawagoe City, Saitama Prefecture (urban) by car, train, bus and airplane. Mental health consultation performed 11 times from July 2019 to Apr 2020. Unfortunately due to the COVID-19 pandemic, I could not go there, then the consultation was performed twice using skype and was stopped.

Results: Although Saitama Prefecture was an urban area, the number of doctors per capita was small and medical care was depopulated same as much as Miyazaki. But unlike countryside there were few reviews, then medical collaboration was difficult. Even in psychiatry, patients that were difficult to treat were examined. We responded to the extent possible.

Case 1: A 45-year-old woman with a personality disorder who complains of deafness. She was withdrawn, isolating from social. Her family were in trouble.

Case 2: A 70-year-old woman with intractable depression requiring modified electroconvulsive therapy (m-ECT) who complains of dizziness.

Discussion: It is necessary to deal with mental illness at neuro-otological clinic, mental health consultation was very important.

Reference: Kiyomizu K, Torihara K, Nakayama M, Fukudome S, Sato S, Tono T: Psychiatric comorbidity in patients with dizziness. Equilibrium Res 71(2): 96-102, 2012

VERIA TECHNIQUE FOR COCHLEAR IMPLANTATION

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Introduction/Aim: The Veria technique is a non-mastoidectomy technique for cochlear implantation that was evolved in 1995, because of an unexpected anatomic variation of one case during surgery with the classic mastoidectomy – posterior tympanotomy approach, where it was not possible to locate the basal turn of the cochlea through the posterior tympanotomy.

Methods/Patients: Switching to the endaural approach offered a wide view of the medial wall of the middle ear making the anatomic variation recognizable: extreme posterior rotation of the cochlea.

The technique finally evolved, uses the trans-meatal approach to the middle ear, and this is the most important difference from the classic technique, giving the possibility of full inspection of its anatomy, safe localization of the basal turn of the cochlea and the cochleostomy point or round window opening. A direct tunnel is drilled through the superior – posterior wall of the outer bony canal wall, guiding directly to the facial recess, avoiding the mastoidectomy and posterior tympanotomy.

The skin incision can be either endaural or postauricular, and the insertion of the electrode to the cochlea can be done through a cochleostomy or through the round window membrane.

Results: The steps of the procedure are: (1) endaural or post auricular incision with intrameatal approach, that offers a wide accessibility to the middle ear structures; (2) inspection of the middle ear anatomy; (3) straightening of the postero-superior bony canal wall in case it presents a concavity; (4) marking the cochleostomy through the outer ear canal, or drilling the bony rim of the round window to visualize the secondary membrane; (5) drilling a suprameatal hollow, which is used for the accommodation of the electrode excess; (6) drilling of the trans-wall direct tunnel to the facial recess, which is the pathway for the active electrode; (7) extension of the incision, preparing of the flaps; (8) creating the bed and fixing the device; (9) completing the cochleostomy or puncturing the secondary membrane and inserting the electrodes; (10) manipulating the excess of the active electrode into the supra meatal hollow, and (11) closing.

For this technique, two special instruments have been developed: a special perforator used for the drilling of the direct tunnel for the active electrode, making it completely safe, and a safety electrode forceps used to manipulate the active electrode in the middle ear during insertion.

Discussion: The Veria Technique is very efficient and versatile making it suitable for all kind of cochlear implants, all ages, and particularly suitable for difficult cases such as anatomic variations like poor mastoid development, malformations, revisions, or pathologies like post inflammatory or otosclerotic cochlear ossifications.

BRIEF OUTLINE OF EU GUIDELINES ON TINNITUS DIAGNOSIS AND MANAGEMENT

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Introduction/Aim: The main goal of the EU Tinnitus guideline is to establish uniformity in the assessment and treatment of adult patients with subjective tinnitus.

Methods/Patients: It aims to establish consistency in policy to optimise referral trajectories and reduce over- and under-assessment and treatment.

Results: Guidance for detailed clinical definition and characterisation of cases is also included. European Experts from different disciplines have joined forces to develop standardisation procedures for easy and meaningful patient profiling.

Discussion: The guideline should be used as a tool to support shared decision-making with patients to facilitate individualised care.

AN INTEGRATED MULTILEVEL MODEL OF NEUROMODULATION FOR THE HEARING PROCESS

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Introduction/Aim: Remediation of hearing loss problems requires better understanding of the related processes from the molecular to the systems level.

Methods/Patients: Accordingly, we investigated how neuromodulation can be used for therapeutic purposes to ameliorate hearing. To do so, we examined the auditory organ from structural, functional, and dynamic aspects applying systems theoretic approach. In addition, we determined at molecular, cellular, as well as organ levels the possible therapeutic benefit of neuromodulation on the auditory process.

Results: The effect of neuromodulation has been investigated at the molecular level via its effect on Ca2+ and K+ channels, and on neurotransmitters; while at the cellular level its effects on the neurons were studied. At the systems level, the magnitude to which changes in the functions and the functional dynamics of the auditory system, as a whole provide a therapeutic effect was examined.

VERTIGO: EUSTACHIAN TUBE FUNCTION SHOULD BE TESTED BEFORE VESTIBULAR FUNCTION

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Introduction/Aim: Background: Eustachian tube dysfunction (ETD) is defined by the 2015 Eustachian Tube Dysfunction Consensus Statement as symptoms and signs of pressure dysregulation, often associated with ventilatory dysfunction, in the middle ear.[1] Vertigo caused by ETD was left off the consensus statement but is a distinct clinical entity. It is caused in most (and perhaps all) instances by unilateral Eustachian tube obstruction, or by more complete obstruction one side than the other.[2] Baro-challenge-induced ETD can cause alternobaric vertigo (ABV) when the fluctuation in pressure causes asymmetric middle ear pressures in ambient pressure.[3] ABV is defined as dizziness which occurs as a result of asymmetric vestibular function due to asymmetric middle ear pressures.[3,4]

Methods/Patients: Purpose: The aim of this paper is to highlight the distinct overlap of the symptoms of ABV and ETD: both conditions may be accompanied by pressure disequilibrium, specifically symptoms of 'aural fullness' or 'popping' sensation and discomfort/pain, pressure, clogged or an 'under water' sensation, crackling, ringing, autophony and/or muffled hearing in one or both ears.[1] In severe cases, vertigo, nausea, vomiting, and nystagmus can also occur.

Results: Focus of paper: Persistent ABV at ground level is associated with abnormal vestibular function test results. In 2012, Dr. Charles Bluestone demonstrated that normalizing bilateral middle ear pressure returns vestibular function to normal which completely resolves vertigo.[3] A primary reasons for assessing the Eustachian tube function is the need to make a differential diagnosis in patients with intact tympanic membrane without evidence of otitis media, but with symptoms potentially related to ETD (including vertigo).[3] The condition should be differentiated from peripheral causes such as Menière's disease, benign paroxysmal positional vertigo, and vertebrogenic dizziness, as well as central disorders.[5] Of note, cases of insidious ABV are most likely to be overlooked because gastrointestinal symptoms are predominant.[2] It is important that Eustachian tube function should be assessed before vestibular function to rule out ETD. Because the test results can erroneously indicate vestibular organ dysfunction, when in fact, the vertigo symptoms stem from ETD.

Discussion: Overview: Taking these points into consideration, I would like to (1) propose that ABV should be included in the ETD Consensus Statement as an official symptom of ETD, (2) reiterate that Eustachian tube function should be tested before vestibular function, and (3) call for case studies and research into cases of vertigo where Eustachian tube function was assessed before vestibular function.

Reference: 1. Schilder AG, Bhutta MF, Butler CC, et al. Eustachian tube dysfunction: consensus statement on definition, types, clinical presentation and diagnosis. Clin Otolaryngol. 2015;40(5):407–411.

2. Merica FW. Vertigo due to obstruction of the Eustachian tubes. JAMA. 1942;118(15):1282–1284.

3. Bluestone CD. Eustachian tube: Structure, function, and role in Middle Ear Disease. 2nd ed. People Medical Publishing House USA: Raleigh, North Carolina; 2018.

4. Roland PS, Rutka JA. Physiology of the vestibular system. In: Rutka JA (Ed.), Ototoxicity, BC Decker Inc., Hamilton, Ontario, Canada, 2004; 20.

5. Mallen JR, Roberts DS. SCUBA Medicine for Otolaryngologists: Part II. Diagnostic, Treatment, and Dive Fitness Recommendations. Laryngoscope. 2019;9999:1–6

OVERVIEW OF DIAGNOSTIC AND THERAPEUTIC USES OF ELECTROMAGNETIC FIELDS

Prof. Dr. Mats-Olof Mattsson
SciProof International AB, Östersund, Sweden

Introduction: The potential for using non-ionizing electromagnetic fields (EMF; at frequencies from 0 Hz up to the THz range) for medical purposes has been investigated for many decades. Several established and familiar methods are in use globally. Other applications, which will be the subject of this talk, have some clinical use, or are in earlier stages of development.

Methods: The covered methods include modalities used for bone healing, cancer treatment, neurological conditions, and diathermy. In addition, certain other potential clinical areas are touched upon. Most of the reviewed technologies deal with therapy, whereas just a few diagnostic approaches are available.

Results: None of the discussed methods are having such a strong impact in their field of use that they would be expected to replace conventional methods. Partly this is due to a knowledge base that lacks mechanistic explanations for EMF effects at low intensity levels, which often are used in the applications. Thus, the possible optimal use of EMF approaches is restricted. Other reasons for the limited impact include a scarcity of well-performed randomized clinical trials that convincingly show the efficacy of the methods, and that standardized user protocols are mostly lacking.

Discussion: Presently, it seems that some EMF-based methods can have a niche role in treatment and diagnostics of certain conditions, mostly as a complement to or in combination with other, more established, methods. Further development and a stronger impact of these technologies need a better understanding of the interaction mechanisms between EMF and biological systems at lower intensity levels. The importance of the different physical parameters of the EMF exposure needs also further investigations.

WHAT YOU ALWAYS WANTED TO KNOW ABOUT HEALTH AND ELECTROMAGNETIC FIELDS

Prof. Dr. Myrtill Simkó
SciProof International AB, Östersund, Svédország

Introduction/Aim: Electric and magnetic fields are invisible forms of energy (also called radiation) that can be either man-made (produced by electricity, which is the movement of electrons (current), through a wire), or occur naturally. Electric and magnetic fields together are referred to as electromagnetic fields, or EMFs. The electric and magnetic forces in EMFs are caused by electromagnetic radiation. There are two main categories of EMFs:

- Ionizing: Higher-frequency EMFs which has the potential for cellular and DNA damage, and
- Non-ionizing: Low- to mid-frequency EMFs including static fields (electric or magnetic fields that do not vary with time), magnetic fields from electric power lines and appliances, radio waves, microwaves, infrared radiation, and visible light, which are generally perceived as harmless to humans.

Since several decades there is a scientific discussion about the health-related effects of the low frequency and the radiofrequency part of the EMF spectrum. Despite large amounts of scientific papers, experts and committee opinions could not clearly answer the question of possible detrimental effects of these fields since the mode of action behind many described effects are not known. Described effects have been published in different medical and biological disciplines, suggesting e.g. increased cancer incidences as well as cellular and molecular changes. At the same time, studies showing no effects at all have been published. Nevertheless, the International Agency for Research on Cancer (IARC), a part of the World Health Organization, classified EMFs as “possibly carcinogenic to humans,” based on limited evidence from human studies in relation to certain kinds of cancer (for both power line frequencies and radiofrequency fields).

Although many studies on the possible influence of EMFs have been conducted, there are conflicting results due to differences in experimental conditions and also due to different statistical interpretations.

In this presentation an overview will be given that provides an insight about the present knowledge of EMF effects in biology and medicine. Furthermore, increasingly, different frequency parts of the EMF-spectrum are investigated for potential medicinal use in both therapy and diagnostics, hoping for new technologies without side effects.

RECENT TEND OF COMPLICATIONS IN CHRONIC SUPPURATIVE OTITIS MEDIA

Dr. Rajeev Singh
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Introduction/Aim: Chronic suppurative otitis media (CSOM) has been an important cause of middle ear disease since prehistoric times. CSOM is a long standing inflammation of the middle ear cleft. The diagnosis of CSOM implies a permanent abnormality of the pars tensa or flaccida. Many consider it important to differentiate between the two types of CSOM; safe and unsafe type: this is because of higher risk of complications associated with the cholesteatoma which can lead to life threatening conditions.

Complications are more common in patients having atticoantral type of disease than tubotympanic type . Complications in unsafe CSOM are generally due to the bone erosion caused due to expanding sac of cholesteatoma.

Methods/Patients: This study is a retrospective study, in which total of 450 cases were studied. Study was conducted on the patients who were treated in the department of Otorhinolaryngology and Head and Neck surgery, SRMS, Bareilly, India between January 2019 to December 2021.

All the patients were studied and were divided into two groups:

- Group A: cases of CSOM safe type
- Group B: cases of CSOM unsafe type.

All the patients underwent a thorough history and clinical assessment along with audiometric and radiological investigations.

Inclusion criteria:

- Patients having discharging ear

Exclusion Criteria:

- Congenital ear disease
- Suspicion of malignancy

Results: A total of 766 cases were studied between the age group of 10 years to 50 years among which group A included 525 cases and Group B included 241 cases. Out of 766 cases 420 were females (54.83%) and 346 males (45.16%).

Out of 766 cases 315 cases had bilateral ear disease (41.12%) 221 cases had right ear disease (28.85%) and 230 cases had left ear disease (30.02%).

Out of 241 cases of unsafe CSOM cases, 30 cases presented with complications, 23 cases (76.66%) had extracranial complication and 7 cases (23.33%) had intracranial complications.

Discussion: Chronic suppurative otitis media, infection of the middle ear cleft, is a common disease and the complications associated with it, pose a major problem increasing the mortality and morbidity. It is a major problem in developing countries. The proximity of the middle ear cleft and mastoid air cells to the extracranial and intracranial compartments

places structures located in these areas at increased risk of infectious complications. Complications are seen more in rural population than in urban population.

Reference: Datta G, Mohan C, Mahajan M, Mendiratta V, correlation of preoperative HRCT findings with surgical findings in unsafe CSOM. IOSR Journal of Dental and medical sciences, 2014; 13(1):120-125.

Rai T, Radiological Study of the temporal bone in chronic otitis media: Prospective study of 50 cases, Indianjotol july 2016;20(2):48-55.

Viswanatha B, Changing trends in clinical presentation and management of chronic otitis media with complications. J Laryngol Otol Nov 2015;16-20.

Mittal R, Lisi V C, Gerring R, J med microbiology, 2015;64: 1103-1116.

COMPARISON THE CHARACTERISTICS OF TINNITUS IN TWO AGE GROUPS

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Semmelweis University of Medicine, Department of Otorhinolaryngology and Head and Neck Surgery, Budapest, Hungary

Introduction/Aim: We have been caring for tinnitus patients since 2011 at the "Tinnitus outpatient clinic" of the Department of Otorhinolaryngology and Head and Neck Surgery, Semmelweis University. The detrimental effect of tinnitus on quality of life is a proven fact, we can monitor this with self-administered questionnaires. one of which is the Hungarian-validated Tinnitus Handicap Inventory we use.

Our aim was to compare the quality of life characteristics of patients treated for tinnitus complaints in two age groups and to investigate further correlations with the presence of their other complaints.

Methods/Patients: The 150 tinnitus patients treated between January 2017 and March 2018 were divided into two age groups based on the age group classification of WHO - 10-47 years (74 patients, mean age 33.53 ± 9.67 years) and 48-78 years (76 patients, mean age 62.01 ± 7.88 years) - data were processed. Using R statistical program we analyzed anamnestic data, tinnitus side and duration, hearing loss, dizziness complaints, and the full and subscale results of the Tinnitus Handicap Inventory (THI) according to the two age groups

Results: In our study, the deterioration in the quality of life of the older age group proved to be greater, the average of the THI was 40.72 points in the younger age group and 46.69 points in the older age group, but statistically it was not significant. Of the examined characteristics, the laterality and duration of tinnitus, hearing impairment and dizziness had no effect on quality of life, only the influence of the female gender reached the 5% significance limit.

Discussion: The effect of tinnitus complaint on quality of life in the study population did not show significant age differences, but showed a slight gender correlation for female gender, which may be worth considering not only in determining first therapeutic options but also in treatment success.

Reference: Bencsik B.,Stauder A.,Trimmel K.,Tamás L. Hungarian adaptation of the Tinnitus Handicap Inventory - reliability and validity, Eur Arch Otorhinolaryngol (2015) 272:2243–2248

Langguth B. et al. Consensus for tinnitus patient assessment and treatment outcome measurement: Tinnitus Research Initiative meeting, Regensburg, July 2006. Prog Brain Res, (2007) 12:525–536.

Zeman F, Koller M, Langguth B, Landgrebe M, Tinnitus Research Initiative database study group. Which tinnitus-related aspects are relevant for quality of life and depression: results from a large international multicentre sample. Health Qual Life Outcomes, (2014) 12(1):7.

TEN YEARS FOLLOW UP OF PATIENTS WITH TINNITUS AND NORMAL HEARING

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Objective: To describe the natural history of tinnitus in normal hearing patients.

Study Design: This is a prospective longitudinal observational study.

Setting: Tertiary University Hospital.

Methods/Patients: In 2009 we studied 68 patients with significant tinnitus and normal hearing (Study group-SG) compared to 46 patients with normal hearing and no tinnitus (control group-CG). We have been able to contact and recruit 24 patients from SG (35.3%) and ten patients from CG) (21.74%) in 2019. Both groups were submitted to conventional audiometry,distortion product otoacoustic emissions (DPOAE), tinnitus handicap invenctory(THI), visual analog scale(VAS) and Beck`s depression and anxiety scales (BDS, BAS). These measures were compared with the same ones performed tem years ago in the same groups of patients. The software SPSS for windows version 21 was used . p values <0.05 were considered significant. Student t test was used to compare SG and CG results in 2019 and to compare 2009 and 2019 outcomes.

Results: Hearing loss specially in the high frequencies were significantly worse in SG compared to GC in 2019. DPOAE were significantly worse in SG and CG in 2019 however CG had more abnormal results than SG.

Discussion: Conclusions: These results suggest that tinnitus is a first sign of hearing loss. However it does not always precede deafness. Outer hair cells lesions are not the cochclear trigger for tinnitus.

Key words: Tinnitus, hearing loss, longitudinal study.

INTRATYMPANICALLY ADMINISTERED STEROID FOR SENSORINEURAL HEARING LOSS OF PATIENTS SUFFERING FROM MÉNIÈRE'S DISEASE

Dr. András Molnár, Dr. Stefani Maihoub, Prof. Dr. László Tamás Phd, Ágnes Szirmai Phd
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Introduction/Aim: Ménière's disease is characterized by episodic rotational vertigo, sensorineural hearing loss, tinnitus, and vegetative symptoms. Hearing loss in Ménière's disease is described as sensorineural. Initially, it is resolved completely between attacks, and in the early stages, low frequency (200-600 Hz) hearing loss can be detected with fluctuating tendency using pure tone audiometry. Locally administered steroid is one of the treatment options of the sensorineural hearing loss, and of the hearing loss of Ménière's disease.

The aim of the presented study is to follow up the effects of the intratympanic steroid treatment of hearing loss in Ménière's disease.

Methods/Patients: A group of 105 clinically diagnosed patients suffering from Ménière's disease were enrolled in this investigation. Long-term follow-up was carried out, and pure tone speech audiometry results of the subjects before and after application of steroid were contrasted. Statistical analysis was carried out using the IBM SPSS V24 software.

Results: Based on the audiograms in this population, all stages of hearing loss were presented (from slight to profound). In most of the cases (68.6%), after intratympanic dexamethasone treatment, stagnation in the hearing profile was achieved. Moreover, there was a smaller group demonstrating hearing improvement after the treatment (12.4%). According to logistic regression [p=0.001; Odds ratio: 2.75 (95% CI 1.068 – 4.442)], there was a strong correlation between hearing improvement and dexamethasone treatment (all patients were treated with intratympanic dexamethasone, while improvement without steroid treatment could never be attained). Due to the local application, the side effects were negligible. In some of the cases, a short-lived vertigo occurred, but this complaint was transient. Other complications (just like perforation of the tympanic membrane) were not occurred.

Discussion: Finally, it can be concluded that intratympanically administered dexamethasone is a potent and safe agent to prevent the progression of hearing loss in Ménière's disease.

Reference: This is an Accepted Manuscript of an article published by Taylor & Francis in [ACTA OTOLARYNGOLOGICA] on [09 Sep 2019], available online: http://www.tandfonline.com/[Article DOI: 10.1080/00016489.2019.1658898].

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INTRATYMPANIC GENTAMICIN FOR MÉNIÈRE'S DISEASE: IS THERE A SELECTIVE VESTIBULOTOXIC EFFECT?

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Introduction/Aim: Ménière's disease is a disorder characterized by vertigo, hearing loss, tinnitus, and vegetative symptoms. For intractable cases, intratympanic gentamicin could be used in clinical practice.

The aim of our study is to investigate the effectiveness and safety of the treatment, based on vertigo diaries and pure tone audiograms.

Methods/Patients: The complete medical documentation of 105 definite patients (31 males, 74 females, mean age ± SD, 57.38 years ± 11.07) suffering from Ménière's disease was analyzed. In the studied group, 9 patients were treated with intratympanic gentamicin. The application of gentamicin was carried out under a microscope, through the anteroinferior part of the tympanic membrane, using local anesthetization. 8 mg gentamicin sulphate was used, on alternate days, 2 to 4 times until acute unilateral vestibular hypofunction with typical clinical signs appeared. Long-term follow-up of the patients was carried out, using vertigo diaries, medical letters, anamnestic data, and pure tone audiograms. Audiometric results and vertigo complaints before and after treatment were contrasted using IBM SPSS V24 software, based on Mann-Whitney U test, logistic regression and survivorship curves.

Results: Based on our analysis, vertigo attacks appeared significantly less often after gentamicin treatment [$p < 0.001$; Odds ratio: 0.003 (95% CI: 0.001-0.012)], which confirms the efficacy of the therapy. Pure tone stages before and after the application of gentamicin were contrasted using the Mann-Whitney U test. When comparing the audiometric results of long-term follow-ups by using the logistic regression, a statistically significant difference was observed between the treated and not treated groups [$p=0.001$; Odds ratio: 0.141 (95% CI 0.064 – 0.313)], and based on the survivorship curve hearing impairment was more common in the not treated group, which also supports our results. Based on the non-parametric test, there was no significant difference ($p= 0.84$) between the pure-tone stages of the control group and of those treated with gentamicin, nor was when the lower ($p= 0.49$) and higher ($p= 0.1$) frequencies were contrasted.

Discussion: Our results indicate that intratympanic gentamicin is effective in controlling vertigo attacks, and there is no higher risk for hearing loss than in case of spontaneous progression of the disorder.

Reference: Molnár A, Maihoub S, Gáborján A, Tamás L, Szirmai Á. Intratympanic gentamycine for Ménière's disease: is there a selective vestibulotoxic effect? Eur Arch Otorhinolaryngol. 2020 Jul;277(7):1949-1954. doi: 10.1007/s00405-020-05901-3. (Springer)

DEPRESSION AND ANXIETY IN THE VERTIGINOUS POPULATION

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Introduction/Aim: In case of vertigo complaints, in many cases, deterioration of quality of life of the patients is shown. Vertigo and dizziness can result in depression and anxiety; therefore, the diagnosis and management of these concomitant psychiatric disorders can improve the patients' quality of life.

The aim of the presented study was to examine the correlation between anxiety, depression and quality of life of patients suffering from vertigo or dizziness.

Methods/Patients: 221 patients (57 male, 164 female patients, mean ± SD age, 56.3 ± 13.3 years), who have visited the Neurotologic Tertiary Referral Centre of the Department of Otolaryngology and Head and Neck Surgery of Semmelweis University, due to vertigo or dizziness, were enrolled in this investigation. These patients have fulfilled the Dizziness Handicap Inventory (DHI), the Beck Depression Inventory and the Symptom Checklist 90-R (SCL-90-R) questionnaire. The statistical analysis was performed using the IBM SPSS V24 software. To analyze correlation, simple linear correlation, Pearson and Spearman correlation tests were used. To detect significant difference, Mann-Whitney U test was applied.

Results: Based on the neurotologic examinations, patients suffering from the following disorders have been enrolled: Ménière's disease (n= 84), central vestibular disorders (n= 48), benign paroxysmal positional vertigo (n= 29), vestibular neuritis (n= 26), other vestibulopathy (n= 16), Persistent Postural-Perceptual Dizziness (n= 12), vestibular migraine (n= 3) and vestibular Schwannoma (n= 3). Based on the DHI results, 86.4% of the patients showed impaired quality of life, of which 33.9% was in the severe range. Beck scale indicated depression in 43.9%. According to the correlation test, significant correlation was detected between the total DHI score and Beck results, and the same outcome was detected in case of the SCL-90-R and DHI results. Correlation was also observed when the Beck and SCL-90-R points were contrasted. When the DHI and Beck points between the different diagnosis groups were contrasted, significantly higher values of patients suffering from central vestibular disorders, vestibular migraine, Persistent Postural-Perceptual Dizziness and other vestibulopathies were observed, contrasted to the results of the other diagnosis groups.

Discussion: Based on the correlation between the DHI, Beck and SCL-90 results, depression and anxiety have significant effect on the patients' quality of life. Therefore, the diagnoses and management of the psychiatric comorbidities is of great importance.

ACKNOWLEDGMENT OF TINNITUS AS A MENTAL HEALTH ISSUE

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Introduction/Aim: Tinnitus is affecting an overall of millions of people worldwide and is still poorly understood by healthcare professionals. The population who endures tinnitus to a degree that their quality of well-being and productivity in life are impaired, may also bring upon mental health impairments.

Methods/Patients: Collaboration with clinical practice findings and questionnaires exact a better understanding of the source of the mental health. Our experience is that if we become aware of the content of a psychological symptom or symptomatic behaviour then improvements occur. If we can talk about what is troubling us, then the overwhelming effect of the event, the thought, the motion, the fear is alleviated.

Results: Then if we become aware of what is driving the symptoms, we can control it better. Therefore, the feeling of helplessness is gone. This makes it easier to steer our lives in the direction we want to go. Consequently, our aim is to bring a solution upon the mental health and life impairment of the tinnitus suffering population.

TINNITUS CHARACTERISTICS AND ASSOCIATED VARIABLES ON TINNITUS HANDICAP INVENTORY AMONG HUNGARIAN POPULATION

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Objective: To explore the impact of tinnitus-related handicap on daily living of tinnitus sufferers and characteristics associated with tinnitus severity.

Methods: A total of 630 patients (265 males and 365 females, 28-85 years of age) suffering from tinnitus were enrolled. These patients have filled the Hungarian version of the Tinnitus Handicap Inventory (THI) questionnaire and underwent a complete otorhinolaryngological examination. The collected data was analyzed using the IBM SPSS V24 software; correlation tests, Mann-Whitney U and Kruskal-Wallis tests were used.

Results: Based on the results of the THI questionnaires, only a quarter (24.9%) of the participant patients were categorized into normal category, and most of the patients (62.5%) presented a mild handicap. By analysing the total THI scores and age of the patients, along with the duration of the symptoms no statistically significant correlation was observed. However, the total THI scores of male and female patients significantly differed, indicating higher THI values of the female group ($p = 0.00052$). When the total THI values of patients suffering right and left sided, and bilateral were contrasted, no significant difference was observed either ($p= 0.05$).

Conclusion: THI scores indicated a worsened handicap of patients suffering from tinnitus. The quality of life was not affected by the duration of the symptoms and age, but was affected by the genders, indicating higher values in the case of females.

ENLARGED VESTIBULAR AQUEDUCT SYNDROME - AUDIO/VESTIBULAR FINDINGS

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Introduction/Aim: Enlarged vestibular aqueduct syndrome (EVAS) is a challenging diagnosis since the symptoms and clinical presentation vary a lot. Here I'm presenting 10 cases, their symptoms and clinical findings. The radiologic criteria was >0.9mm at the midpart of VA or >1.9mm at operculum.

Results: Average age was 37.1 year with 3:7 male to female ratio, left and right side were affected all the same and 2 cases were bilateral. Auditory symptoms were more frequent than vestibular but most of the cases had both audio and vestibular symptoms. Hearing loss was the most frequent symptom. The hearing loss was mixed; conductive or mixed loss at low and mid frequencies and sensorineural at high frequencies. Half of the cases had significant hearing loss on the opposite ear without signs of enlarged VA. Two cases presented with sudden sensorineural HL, in 4 hearing fluctuated and in two hearing loss was progressive and in 2 stable over time. Precipitating factors were head trauma in three, wisdom tooth extraction in one, respiratory infection preceded hearing loss in one and straining in two. Cervical VEMP was normal in 6 of 8, augmented in one and absent in one. Ocular VEMP was absent in 5 of 7, augmented amplitude in one and absent in one. Caloric test showed significant canal paresis in 4 of 4, some of them had normal VOR gain at VHIT. In 30% VHIT was normal.

Conclusion: diverse symptoms and clinical findings still make EVAS difficult to diagnose. Hearing loss is the most common symptom and usually of mixed type. Caloric response is frequently reduced at the affected ear, oVEMP is frequently absent, but cVEMP normal.

IPSILATERAL VESTIBULOPATHY RELATED TO HERPES ZOSTER INFECTION

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Introduction/Aim: A variety of symptoms regarding cochleovestibular dysfunction may be related to herpes zoster virus (HZV). Among symptoms include vertigo, hearing loss and others include facial paralysis. Video-head-impulse test (vHIT) examines the function of all three semicircular canals, and as a result, the ratio of velocity of head and eye movements can be determined, therefore the gain parameter. In this presebt case report of a 58-year-old female with an infectious complication of HZV is presented. The patient only presented vertigo episodes, with no other accompanied symptoms. The patient was complaining only of a right sided ear pain, and HZV infection was diagnosed, therefore, antiviral therapy with acyclovir was indicated. Vertigo complaints appeared post-hospitalization, thus, neurotologic examination using vHIT was carried out. According to vHIT, on all right sided three semicircular canals a significant hypofunction was detected, with almost normal function on the left side canals. Hence, intravenous steroid therapy followed by oral steroid treatment was indicated for the overall time of two weeks. Control vHIT examination was conducted at the end of the treatment, and a significant improvement of all the semicircular functions was detected, along with subjective improvement of the symptoms. This case highlights the necessity of thorough examination of the patients, and to reinforce the need of early treatment by using steroid agents in patients with HZV.

Keywords: vestibulopathy, vertigo, video-head-impulse test, unilateral hypofunction, steroid therapy

MÉNIÈRE'S DISEASE: A COMPARATIVE STUDY BETWEEN THE AUDITORY AND VESTIBULAR FUNCTIONS

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Introduction: Disturbance in the cochleovestibular functions is seen in Ménière's disease (MD). To verify the disturbances investigation methods include pure tone audiometry (PTA) and caloric test registrations.

Aims: To assess the relationship between the loss of the cochleovestibular functions in MD.

Methods: PTA and caloric test examinations were performed in forty-three patients with definite MD. Canal paresis (CP%), dPTA (interaural difference of hearing level), and average PTA results were contrasted. IBM SPSS V24 was used for statistical analysis.

Result: According to the diagnostic criteria of PTA of the American Academy of Otolaryngology-Head and Neck Surgery of MD, most patients were in stage C, and caloric weakness was found in 29 patients. Linear ($R2 = 0.06$) and nonlinear correlation tests ($rho = 0.245$, $P = 0.113$) between canal paresis (CP%) and dPTA showed no correlation, as well as between CP% and PTA analysis ($R2 = 0.007$, $rho = 0.11$, $P = 0.481$). No correlation was detected also between the groups either as per the categorial analysis ($k = 0.174$, 95% CI: 0.0883 - 0.431).

Conclusion: Based on the results of the analysis, it was concluded that a more advanced stage determined by audiometry does not indicate parallel increasing values in the CP% parameter of the caloric test. Therefore, audiometric changes do not directly correspond with the vestibular ones; consequently no specific correlation exists between them. Thus, for therapy planning and diagnosis, both tests are necessary.

VERTIGO EXAMINATION IN A HUNGARIAN EMERGENCY DEPARTMENT

Dr. Stefani Maihoub Phd [1], Dr. András Molnár [1], Dr. András Csikós [2], Dr. Péter Kanizsai [2], Dr. László Tamás Phd [1], Dr. Ágnes Szirmai [1]

[1] Department of Otolaryngology and Head and Neck Surgery, Semmelweis University, Budapest, Hungary

[2] Semmelweis Emergency Department, Budapest, Hungary

Introduction: Dizziness and vertigo are considered among the most common complaints in the emergency department. This can be a problematic presentation, both from a diagnostic and a management standpoint.

Aim: to clarify what happens to patients after leaving the emergency department and assess the effect of an acute vertigo episode on the quality of life after patients' dis¬charge.

Methods: 879 patients examined at the Semmelweis University Emergency Department with vertigo and dizziness was included. A questionnaire, including the Dizziness Handicap Inventory (DHI), was addressed to this population. We received 308 answered questionnaires back (110 males, 198 females; mean age 61.8 years ± 12.31 SD), which were further analyzed.

Results: Based on the emergency department diagnosis we had the following results: central vestibular lesion (n = 71), dizziness or giddiness (n = 64) and BPPV (n = 51) were among the most frequent diagnosis. Clarification of the final post-examination diagnosis took several days (28.8%), and weeks (24.2%). It was also noticed that 24.02% of this population never received a proper diagnosis. Among the population only 80 patients (25.8%) got proper diagnosis of their complaints, which was supported by qualitative statistical analysis (Cohen Kappa test) result ($\kappa = 0.560$). According to the analysis of the DHI questionnaire, a difference between physical, functional and emotional scores was shown, whereas the highest scores were registered in the physical group. In addition, an increase in DHI scores was seen depending on the time elapse for the definitive diagnosis.

Conclusion: The correlation between our emergency department diagnosis and final diagnosis given to patients is low, a phenomenon that is also observable in other countries. The absence of adequate examination and a late diagnosis of the dizziness cause have a significant impact on the quality of life of patients. Therefore, substantial investigation, early diagnosis, and detailed vestibular examina¬tion are essential, but the latter should take place in justified cases.

Keywords: vertigo, emergency department, follow-up, Dizziness Handicap Inventory questionnaire, quality of life

INTRATYMPANIC GENTAMICIN FOR MÉNIÈRE'S DISEASE: IS THERE A SELECTIVE VESTIBULOTOXIC EFFECT?

Dr. András Molnár, Dr. Stefani Maihoub Phd, Dr. László Tamás Phd, Dr. Ágnes Szirmai Phd

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Methods: The complete medical documentation of 105 definite patients (31 males, 74 females, mean age ± SD, 57.38 years ± 11.07) suffering from Ménière's disease was analyzed. In the studied group, 9 patients were treated with intratympanic gentamicin. The application of gentamicin was carried out under a microscope, through the anteroinferior part of the tympanic membrane, using local anesthetization. 8 mg gentamicin sulphate was used, on alternate days, 2 to 4 times until acute unilateral vestibular hypofunction with typical clinical signs appeared. Long-term follow-up of the patients was carried out, using vertigo diaries, medical letters, anamnestic data, and pure tone audiograms. Audiometric results and vertigo complaints before and after treatment were contrasted using IBM SPSS V24 software, based on Mann-Whitney U test, logistic regression and survivorship curves.

Results: Based on our analysis, vertigo attacks appeared significantly less often after gentamicin treatment [$p < 0.001$; Odds ratio: 0.003 (95% CI: 0.001-0.012)], which confirms the efficacy of the therapy. Pure tone stages before and after the application of gentamicin were contrasted using the Mann-Whitney U test. When comparing the audiometric results of long-term follow-ups by using the logistic regression, a statistically significant difference was observed between the treated and not treated groups [$p=0.001$; Odds ratio: 0.141 (95% CI 0.064 – 0.313)], and based on the survivorship curve hearing impairment was more common in the not treated group, which also supports our results. Based on the non-parametric test, there was no significant difference ($p= 0.84$) between the pure-tone stages of the control group and of those treated with gentamicin, nor was when the lower ($p= 0.49$) and higher ($p= 0.1$) frequencies were contrasted.

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Dr. András Molnár, Dr. Stefani Maihoub Phd, Dr. László Tamás Phd, Dr. Ágnes Szirmai Phd
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Conclusion: Finally, it can be concluded that intratympanically administered dexamethasone is a potent and safe agent to prevent the progression of hearing loss in Ménière's disease.

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