5th French-Brazilian Symposium on Hearing

Auditory processing and central disorders

June 20 and 21, 2024

Faculdade de Medicina UFMG

190, Professor Alfredo Balena Avenue,
Belo Horizonte - Minas Gerais

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Contents

Introduction

Audiology pays increasing attention to the exploration of auditory centers, where the spectro-temporal parameters of sound messages extracted by the cochlea are processed, denoised, categorized and eventually, interpreted.
Speech and language processes are tightly dependent on auditory circuit-abilities and are affected whenever auditory circuits do not function properly. This places auditory processing disorders on top of the current issues in audiology. Whether they result from impaired development of peripheral sound processing or from intrinsic central dysfunctions may be of minor importance since the consequences are similar in terms of developmental delay in children and disability in adults.
This 5th French Brazilian Symposium on Hearing devoted two sessions to this hot topic.
The current insights on perceptual distortions such as hyperacusis and experience of annoying tinnitus and their relation to unsuitable adaptations of auditory circuits to abnormal afferent activity were reviewed. How psychophysics and electrophysiology guide a precise diagnosis and how hearing aid and cochlear implant technical improvements can provide solutions to the affected patients was examined. We trust that these highlights on a formerly neglected and now rapidly moving theme, with keynote conferences by acknowledged specialists from several continents, blazed a trail from screening to diagnosis to rehabilitation.
The symposium also offered an opportunity for undergraduate, graduate students and professionals to present their research studies. After evaluation by a scientific committee, awards were granted to the best presentations.
This book of abstracts presents a summary of the discussions that took place during the event, as well as summaries of the papers presented in poster sessions.
We hope in this way to circulate more braodly what was discussed in these days of events.

Professor Paul AVAN **and** **Professor Sirley CARVALHO**

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Thursday, JUNE 20

8:00 – 9:00 am	CHECK-IN
9:00 – 9:30 am	OPENING CEREMONY
9:30 – 10:00 am	OPENING LECTURE **Paul Avan – Professor Emeritus at Université Clermont-Auvergne and Director of Ceriah, center for human audiology, Hearing Institute, Institut Pasteur-Paris, France** Hyperacusis, from one symptom to many possible mechanisms
	SESSION 1: HYPERACUSIS and TINNITUS Coordinators / Moderators Ludimila Labanca - Speech therapist and audiologist, Adjunct Professor, UFMG, Brazil Paul Avan – Professor Emeritus at Université Clermont-Auvergne and Director of Ceriah, center for human audiology, Hearing Institute, Institut Pasteur-Paris, France
10:00 – 10:30 am	KEYNOTE LECTURE **Denise Utsch Gonçalves - Otorhinolaryngologist, Full Professor, UFMG – Brazil** **Transcranial Electrical Stimulation in the treatment of tinnitus**
10:30 – 11:10 am	KEYNOTE LECTURE **Pim van Dijk - Professor of Audiology, Medical physicist, University Medical Center Groningen, The Netherlands** **New views on tinnitus and hyperacusis from neuroimaging data**
11:10 – 11:50 am	HOT TOPICS around tinnitus **Patrícia Cotta Mancini - Speech therapist and Audiologist, Associate Professor, UFMG, Brazil** **Mariana de Castro Denaro - Otorhinolaryngologist at Hospital das Clínicas, UFMG, Brazil**
11:50 – 12:40 am	**VISIT to the STANDS / VISIT to the POSTERS**
12:40 – 13:40 am	**LUNCH**

1:40 – 2:40 pm	**PANEL 1 – Cochlear implant - Nobre Hall** **Coordinator: Ana Cristina de Oliveira Mares Guia - Speech therapist and Audiologist, Brazil** **Speakers:** **Celso Gonçalves Becker - Otorhinolaryngologist, Associate Professor, UFMG, Brazil.** **Izabel Cristina Campolina Miranda – Speech therapist and Audiologist – Adjunct Professor, UFMG – Brazil**
	PAINEL 2 - Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) e Processamento Auditivo - Sala 062 **Coordinator: Amélia Augusta de Lima Friche - Speech therapist, Associate professor, UFMG, Brazil** **Speakers:** **Stela Maris Aguiar Lemos - Speech therapist and Audiologist, Associate Professor, UFMG, Brazil.** **Marina Borges - Speech therapist and Audiologist at HC/UFMG, Brazil** **Raimundo Oliveira Neto - Speech therapist and Audiologist at Municipal Secretary of Health of Belo Horizonte**
SESSION 2: Processing of sound by the brain or by hearing aids Coordinators / Moderators Pedro de Lemos Menezes - Speech therapist and Audiologist – Professor, UNCISAL – Brazil Stela Maris Aguiar Lemos - Speech therapist and Audiologist, Associate Professor, UFMG, Brazil	
2:40 – 3:30 pm	KEYNOTE LECTURE Emmanuel Ponsot – CNRS researcher at the Laboratory of Science and Technology of Music and Sound – Acoustic Psychophysics and Modeling, Paris, France Spectro-temporal analysis in the auditory system: Psychophysical data and models

3:30 – 4:30 pm	**VISIT to the STANDS / VISIT to the POSTERS /COFFEE BREAK**
4:30 – 5:00 pm	KEYNOTE LECTURE Christophe Micheyl – Senior Principal Research Scientist in Advanced Development, Starkey – Lyon - France New frontiers in hearing-aid development
5:00 – 6:00 pm	HOT TOPICS around Audiological Evaluation in childhood Gabriela Cintra Januário – Speech therapist and Audiologist, Directorate of Thematic and Strategic Actions of the State Department of Health of Minas Gerais, Brazil Miguilim Program: hearing and eye health of students in Minas Gerais Adriana Ribeiro Tavares – PhD Professor at the Faculty of Medicine of Ribeirão Preto - USP, Brazil How do we prioritize procedures in pediatric audiological assessment? Ana Cláudia Figueiredo Frizzo - Speech therapist, Associate Professor, UNESP, SP, Brazil Audiological assessment in childhood
6:00 pm	**CULTURAL PRESENTATION**

Friday, JUNE 21

SESSION 3: Auditory Processing and its disorders Coordinators / Moderators Fabrice Giraudet - Researcher University Clermont Auvergne (UCA) - Audiologist SoluSons – France Thamara Suzi dos Santos - Speech therapist and Audiologist – Adjunct Professor, UFMG – Brazil	
9:00 – 9:40 am	KEYNOTE LECTURE Hung Thai-Van – Professor at the Department of Audiology and Otoneurological Evaluation, University Hospital of Lyon, France Assessing Auditory Processing in the Reading Impaired
9:40- 10:20 am	KEYNOTE LECTURE Eliane Schochat – Speech therapist and Audiologist, Professor, USP, Brazil Auditory Temporal Processing: what it can tell us
10:20 - 11:20 am	HOT TOPICS around language processing Fabrice Giraudet – Researcher at the Clermont Auvergne University (UCA) and Audiologist SoluSons, France Origin of developmental language disorders, a possible contribution of the cochlea: 'hidden', or just underlooked? To be cross-checked with the help of high frequency DPOAE Sheila Andreoli Balen - Speech therapist, Associate Professor, UFRN, Brazil Contributions of frequency following response to neural decoding of speech in the first years of life Luciana Macedo de Resende - Speech therapist and Audiologist, Associate Professor, UFMG, Brazil Mismatch negativity and FNIRS contribution in the follow-up of auditory-perceptual development in two different life cycles
11:20 – 12:30 pm	**VISIT to the STANDS / VISIT to the POSTERS**
12:30 – 1:30 pm	**LUNCH**

1:30 – 2:30 pm	Nobre Hall - PANEL 3 - Hearing aid promoting language development Coordinator: Fernanda Abalen - Speech therapist and Audiologist, PUC-MG, Brazil Speakers Júlio César Farias Cayres – Speech therapist and Audiologist at AUDIOMARCA - Brazil Érika Parlato - Oliveira – Speech therapist, Director of Babylab Cerep-Phymentin. Université Paris Cité - CRPMS
	Sala 062 - PANEL 4 - Best practices in audiological report preparation and medical record updates Coordinator: Ana Carolina Andrade Valadares - Speech therapist and Audiologist, UFMG, Brasil Speaker Débora Cardoso Rossi - Speech therapist, Conselho Regional de Fonoaudiologia - Crefono 6ª Região.
SESSION 4: Auditory Processing, exploration of disorders and training Coordinators / Moderators Luciana Macedo de Resende - Speech therapist and Audiologist, Associate Professor at UFMG, Brazil Emmanuel Ponsot - CNRS researcher at the Laboratory of Science and Technology of Music and Sound – Acoustic Psychophysics and Modeling, Paris, France	
2:40 – 3:20	KEYNOTE LECTURE Pedro de Lemos Menezes - Speech therapist and Audiologist, Professor at UNCISAL, AL, Brazil Speech apraxia and cortical auditory evoked potentials
3:20 – 4:00	KEYNOTE LECTURE Thamirez Do Val Bello - Audiologist and Speech language pathologist. MED-EL's Rehabilitation specialist, Brazil Meludia: online music training for CI recipients

4:00 - 5:30	GENERAL DISCUSSION: WHAT NEXT? Pedro de Lemos Menezes - Speech therapist and Audiologist, Full Professor at UNCISAL, AL, Brazil Sheila Andreoli Balen - Speech therapist, Associate Professor at UFRN, Brazil Luciana Macedo de Resende- Speech therapist and Audiologist, Professor at UFMG, Brazil Emmanuel Ponsot – CNRS researcher at the Laboratory of Science and Technology of Music and Sound – Acoustic Psychophysics and Modeling, Paris, France General discussion of APDs: what necessary next steps toward neuroscientifically-grounded interventions? Earlier screening? Better distinction between complex disorders with peripheral or central origin? Circuitry and biomarkers? Risk factors?'
5:30 – 6:00	**Award winning posters presented at 5th FBSH and ceremony**

AWARD WINNING POSTERS

P-03
COGNITIVE AND AUDITORY PROCESSING PROFILE OF UNIVERSITY STUDENTS

Sebastian Ariel Jimenez Cortes, Thaís Andreza Oliveira Barbosa, Luciana Cássia de Jesus, Luciana Macedo Resende and Luciana Mendonça Alves.

Federal University of Minas Gerais (UFMG)

Introduction: Central Auditory Processing (CAP) is the ability to process auditory information at the Central Nervous System. Cognition is the cortical processing of information, involving functions as language and memory. These skills are important for communication and academic performance. Although research mostly focus on children and adolescents, the adult population can also be affected by CAP disorders and also cognitive functioning. Objective: Considering that university students have high academic and cognitive demand, and these factors may be influenced by CAP, the study aimed to describe the cognitive and auditory processing profile of undergraduate and graduate students. Methodology: Study approved by the ethics committee #5.137.573 at a Brazilian public university. Students, aged 18 to 39 years, were invited to participate via the institutional email. Tonal Audiometry and Acoustic Immittance Measures were performed, and those who presented hearing loss and/or external/middle ear alterations were excluded. For CAP assessment, the following tests were used: Speech-in-Noise, Pitch Pattern Sequence, Duration Pattern Sequence, Random Gap Detection Test, Dichotic Digits and Masking Level Difference. For cognitive evaluation, tests of attention, working memory, arithmetic, language, executive problem-solving function, and verbal fluency were conducted using the test named Brief neuropsychological assessment instrument - NEUPSILIN. Results: 95 individuals were evaluated, including 55 undergraduate students and 40 graduate students. The results were considered altered if individuals scored below expected in, at least, one of the tests. 23.15% had abnormal findings in both CAP and cognitive evaluation; 58.52% only in CAP and 10.52%, only in cognitive functions. 15.78% had normal tests results. Among those with CAP disorders, the most affected skills were temporal ordering (54.28%), auditory closure (44.28%), and binaural interaction (30.0%). In cognitive evaluation, the most affected were arithmetic (59.37%), verbal fluency (34.35%), language (31.25%), problem-solving (31.25%), and working memory (28.12%). Conclusion: Most students showed abnormalities in, at least, one of the analyzed aspects, especially the auditory ones. Therefore, further research targeting this population is necessary, as auditory, and cognitive difficulties can influence their professional, academic, and social performance.

P-11
ASSESSING THE N400 AUDITORY EVOKED POTENTIAL IN CHILDREN WITH DYSLEXIA UTILIZING THE FONO SENSE APPLICATION

Ana Luiza de Faria Luiz, Isabela Tiezi Rombola, Yara Bagali Alcântara, Simone Aparecida Capellini and Ana Claudia Figueiredo Frizzo

São Paulo State University (UNESP - Marília)

Introduction: One of the most commonly used methods to assess the cognitive processing of auditory and linguistic information is the long-latency auditory evoked potential - N400. The measurement of this component highlights the neuroelectric response related to auditory-linguistic integration in a phonological and semantic context. From the theory of phonological deficit in dyslexia, an effective diagnostic and prognostic evaluation method becomes indispensable in this population. Objectives: to propose a new easily accessible technological tool to facilitate auditory-phonological electrophysiological evaluation through the event-related potential: N400 in children with dyslexia. Method: Ethics Committee No. 4.565.753. The study was developed in different phases, the first being the development and creation of the application compatible with mobile platforms. The APP was created with different forced-choice tasks: congruent and incongruent regarding phonological aspects. Both tasks consisted of pairs, with the congruent task containing words existing in Brazilian Portuguese and the incongruent task containing one existing word and one non-existing word. The second phase involved the performance of auditory-phonological electrophysiological assessment containing frequent (/ba/) and infrequent (/da/) acoustic stimuli presented simultaneously with the execution of the auditory-phonological task generated in the application. The evaluation was performed twice, once for the congruent task and once for the incongruent task. The group consisted of 10 schoolchildren aged 9 to 10 years and 11 months, of both sexes, with an interdisciplinary diagnosis of dyslexia. The registration of late cognitive potentials was carried out using the Biologic's Evoked Potential System (EP) equipment with binaural stimulation, 250 total stimuli, divided into 75% frequent and 25% infrequent, generated at 70dBNA and presented in an oddball paradigm, concurrent with the execution of the auditory-phonological tasks congruent and incongruent presented in the application. The N400 was expected to be identified as the largest negative deflection around 400ms. Results: The N400 component was evoked, evidenced, and recorded in all participants. Regarding latency and amplitude, the results showed differences between congruent and incongruent tasks, confirming phonological deficits in this population. Conclusion: The application (FONOSENSE) was able to elicit and demonstrate the N400, showing its effectiveness.

ABSTRACTS SYMPOSIUM

P-01
CORRELATION ANALYSIS BETWEEN FOREIGN LANGUAGE STUDY AND SELF-PERCEPTION OF CENTRAL AUDITORY PROCESSING SKILLS

Luciana Macedo de Resende, Luciana Mendonça Alves, Luciana Cássia de Jesus and Camila Alves Frois.

Federal University of Minas Gerais (UFMG)

Introduction: When learning a new language, brain connections are strengthened and new connections are created due to neural plasticity, which influences both cognitive and linguistic skills. Furthermore, it can be related to central auditory processing, which involves the brain's ability to interpret and understand sound stimuli, being essential for activities of daily living, efficient communication and even personal safety. Purpose: To relate foreign language study and self-perception of auditory skills. Method: This is a quantitative, observational, descriptive and cross-sectional study, approved by the Research Ethics Committee, n°. 5,137,573. The participants, Brazilians aged 18 to 59, filled out the Central Auditory Processing Abilities Self-Perception Scale (EAPAC) via GoogleForms®, after informed consent. The questionnaire contained 24 questions about hearing complaints and learning, with 692 participants. The data was organized in an Excel® spreadsheet. Age was analyzed using median and quartiles due to lack of normal distribution. The other variables were analyzed using absolute and relative frequency measures and Spearman correlation using IBM SPSS version 15 software, with a significance level of 5%. Results: Results: Of the 692 questionnaires, 67.15% were female, the average age was 31.6 years old and 69.68% were individuals studying in public schools. There was a negative correlation between fluency in a foreign language and difficulty in discriminating the sound (r= -0.080), difficulty in paying attention to the sound (r= -0.097) and difficulty in perceiving the sound in time (r = -0.084). There was a negative correlation between studying a foreign language and difficulty with short-term memory for the sound (r= -0.084). The self-reported complaint by individuals related to the difficulty in learning a new language positively correlated with the difficulty in identifying the sound (r=0.081), understanding variations in vocal intonation (r=0.088) and understanding speech when part is omitted (r- =0.089). Conclusion: Individuals with more complaints regarding central auditory processing skills are those who have studied less foreign language and have self-reported difficulty in learning a new language.

P-02
INFLUENCE OF SOCIODEMOGRAPHIC FACTORS ON SELF-REPORTED HEARING AND ACADEMIC COMPLAINTS

Luciana Cássia de Jesus, Luciana Mendonça Alves and Luciana Macedo de Resende.

Federal University of Minas Gerais (UFMG)

Introduction: Socioeconomic, environmental, cultural and psychological factors influence the way individuals perceive their health status and their performance in various tasks, such as occupational, academic and daily life tasks. Objective: To verify the relationship between complaints associated with central auditory processing (CAP) and academic performance and sociodemographic factors. Methods: The study was approved by COEP, opinion no. 5.137.573, and promoted by CAPES. A self-report instrument, the Central Auditory Processing Skill Self-Perception Scale (Escala de Autopercepção das Habilidades do Processamento Auditivo Central - EAPAC) – expanded, was sent via e-mail to adults from a public university. A total of 692 questionnaires were randomly selected, aged between 18 and 59. A descriptive analysis was carried out and the total, auditory and academic scores on the scale were compared with sociodemographic characteristics such as gender, age, schooling, high school attended and foreign language study. The Mann-Whitney, Kruskal-Wallis and Spearman correlation tests were used, with a significance level of 5%. Results: 67.6% of the sample were female, with a median age of 28, incomplete higher education (42.2%) and from public schools (61%). The majority were not fluent in a foreign language, although they had studied some language (83.5%), with English being the most common (49.5%) and study time between 2 and 4 years (30.3%). A comparison of the scores obtained on the scale with sociodemographic characteristics showed that women had more complaints associated with CAP ($p = 0.022$) and a higher total score on the scale ($p = 0.047$). Age and schooling did not influence self-reported hearing and/or academic complaints ($p > 0.05$). However, having attended public school contributed to the prevalence of complaints related to academic performance ($p = 0.002$) and a higher total score on the scale ($p = 0.011$), as did the absence of language study contributing to a higher total, auditory and academic score ($p = 0.000$). Conclusion: Being female, study in public school and not studying foreign languages contributed to an increase in complaints related to CAP skills and academic performance.

P-04
INDIVIDUALS WITH HYPERACUSIS: CHARACTERIZATION OF AUDITORY STIMULI

Adriane da Silva Assis, Stela Maris Aguiar Lemos, Camila de Souza Santos and Patrícia Cotta Mancini.

Hospital das Clínicas of UFMG

Introduction: Hyperacusis is an auditory condition characterized by hypersensitivity to sounds, resulting in an exaggerated processing of auditory information and making everyday sounds uncomfortable or even painful. Its etiologies include alterations of the peripheral auditory system, central nervous system, infectious, and hormonal diseases. There are four types of hyperacusis: by intensity, discomfort, fear, and pain. Although there is no cure for hyperacusis, approaches such as counseling and sound desensitization offer benefits to patients. In this context, identifying the sounds or everyday situations that cause discomfort to the patient is necessary to contribute to a more assertive rehabilitation. Objective: To identify the main sounds and everyday situations perceived as intense, uncomfortable, feared/avoided, and/or causing pain in individuals with hyperacusis. Methodology: This study is observational, descriptive and cross-sectional and it was approved by the Research Ethics Committee under number 5,809,522. Fifty-five adults with normal audiological examination and diagnosis of hyperacusis were included. Participants answered a questionnaire with 18 environmental sounds and everyday situations, indicating whether they were perceived as intense, uncomfortable, feared/avoided, and/or causing pain. Results: In intensity hyperacusis, power tools were the most frequent sounds, indicated by 43 participants, followed by whistle/horn/siren (n=40), crowds (n=39), dog barking (n=35), and rock concert (n=34). In discomfort hyperacusis group, power tools (n=48), barking and whistle/horn/siren (n=44), crowds (n=42), and high-pitched screams (n=41) stood out. In fear hyperacusis, power tools sounds (n=35), whistle/horn/siren (n=29), crowds (n=27), rock concert (n=25), and high-pitched screams (n=25) were indicated. In pain hyperacusis, power tools sounds (n=15), high-pitched screams and household appliances (n=12) stood out. Conclusion: It was observed that the sound of power tools was consistently identified as the most avoided by patients with hyperacusis, regardless of the type. The data obtained in this study contribute to individualized and targeted interventions, considering the particularities of each patient and the specific challenges faced in their daily lives due to hyperacusis.

P-06
EFFECTS OF GALVANIC VESTIBULAR STIMULATION ON CHANGES IN THE VESTIBULO-OCULAR REFLEX: A CASE REPORT

Alessandra Cardoso, Maria Luiza Diniz, Denise Utsch Gonçalves and Ludimila Labanca.

Federal University of Minas Gerais (UFMG)

Introduction: The Vestibulo-Ocular Reflex (VOR) is responsible for stabilizing the image on the fovea during head movement. Thus, alterations in this reflex result in image blurring during head movements. Galvanic Vestibular Stimulation (GVS) promotes central compensation of the vestibular pathways and their connections. However, its effect on VOR has not yet been studied. Objective: To verify the effect of GVS on VOR in a patient with Ramsay Hunt Syndrome. Methodology: This is an experimental case study, approved by the Research Ethics Committee, under number 28850619.9.3001.5138. A 50-year-old woman participated in the study, diagnosed with Ramsay Hunt Syndrome in June 2023, with severe left vestibular hypofunction. The patient underwent traditional vestibular rehabilitation sessions aiming to promote central compensation. There was resolution of dizziness and imbalance symptoms; however, the patient still complained of the absence of visual fixation during rapid head movements, suggesting insufficient compensation in VOR as a sequela. The patient was invited to undergo GVS twice a week for 15 weeks, using the protocol of [2.5/2/5]; [3.0/2/5]; [3.5/2/5] (voltage in milliampere/stimulus duration in minutes/number of stimulus repetitions). Tests performed before and after the intervention included the Vestibular Test and Posturography. Results: In posturography, there was a decrease in the confidence ellipse area for the “optokinetic to the left on an unstable surface” task (pre-GVS=1110.6mm2; post-GVS=671.6mm2). In the vestibular test, there was a decrease in relative values for Optokinetic Nystagmus (pre-GVS=6.6%, post-GVS=0.9%) and for Labyrinthine Predominance (LP) (pre-GVS=34%; post-GVS=28%) and an increase for Directional Predominance (DP) (pre-GVS=15.8%; post-GVS=24%). The patient reported improvement in visual stabilization, with moments of symptom absence. The findings indicate that GVS was able to modulate vestibular function and its vestibulo-visual connections. Conclusion: GVS can be a promising intervention to improve VOR in cases of severe unilateral vestibular dysfunctions.

P-07
CORTICAL AUDITORY EVOKED POTENTIALS WITH POST MASKING IN ADULTS WITH CENTRAL AUDITORY PROCESSING DISORDER

Danielle Cavalcante Ferreira, Ilka Do Amaral Soares, Carlos Henrique Alves Batista, Vivian Passos Lima Maynart, Pedro de Lemos Menezes and Kelly Cristina Lira de Andrade.

Alagoas State University of Health Sciences (UNCISAL)

Introduction: Central auditory processing disorder arises when there is a change in the processing of auditory information, due to difficulty in one or more auditory skills. Post-masking is one of the characteristics of temporal masking in which noise remains in the auditory system after being interrupted , interfering with the perception of subsequent sounds. The use of cortical auditory evoked potential with noise in individuals with central auditory processing disorder can provide observable electrophysiological measurements, assisting in the diagnosis and monitoring of auditory training in this population. Objective: To analyze the effect of post- masking in cortical auditory evoked potentials with speech stimulus from the noiseless and noise conditions in different signal-to-noise ratios in adults without and with central auditory processing disorder Methodology: Cross-sectional observational analytical study approved by the Research Ethics Committee under opinion number 4.993.648. The sample consisted of two groups of adults aged between 18 and 37 years: 1) Control Group - 30 adults without central auditory processing disorder; 2) Study Group - 30 adults with central auditory processing disorder. The cortical auditory evoked potential was performed with speech stimulus /ba/ in five test conditions: without masking and with masking with an inter-stimulus interval of 3ms in different signal-to-noise ratios (0, -10, -20 and -30 dB). To compare the latencies and amplitudes of the different conditions, the two-way ANOVA test was used. Results: The intergroup analysis showed increased latencies for all waves in all test conditions for the group with Central Auditory Processing Disorder and reduced N1 wave amplitude when comparing the -20 dB signal-to-noise ratio condition for the control group. Conclusion: Adults with central auditory processing disorder showed a greater effect of post-masking from the higher latencies of waves P1, N1 and P2 in the cortical auditory evoked potential with speech stimulus associated with previous noise as the signal-to-noise ratio becomes negative when compared to adults without central auditory processing disorder.

P-08
AUDITORY PROCESSING PROFILE IN ADULTS: IS THERE A PERFORMANCE DECLINE IN MIDDLE AGE?

Pamela Papile Lunardelo da Silva, Marisa Tomoe Hebihara Fukuda and Sthella Zanchetta.

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Introduction: One of the most frequent complaints in adulthood is difficulty understanding speech, despite the preserved hearing sensitivity. Its occurrence can be attributed to the Central Nervous System's structural and physiological changes, which start around 30 and increase at age 40. It is essential to understand the impact of advancing age, still in adulthood, on temporal AP tests and self-perception of hearing difficulties. Purpose: Evaluate the occurrence or not of performance change in the different aspects that make up the temporal mechanism of AP between the different age groups of adulthood. Also, evaluate the self-reported hearing difficulties in these decades of life. Methods: Ethics Committee n°4.795.590. Participants were 80 adults, aged 18 to 59 years, divided into four groups, each with 20 participants (10 women): G1 (18-29); G2 (30-39); G3 (40-49); G4 (50-59 years). Inclusion criteria were the absence: neurological or psychiatric medical follow-up; history of otologic or head and neck surgery; hearing loss; noise exposure; head trauma or cerebrovascular accident; ten years of schooling. Exclusion criteria were hearing loss on the evaluation day and abnormal in the Mini-Mental State Examination scores. Hearing assessment were Pitch Pattern Sequence (PPS), Duration Pattern Sequence (DPS), Gap-in-Noise (GIN) and of the Amsterdam inventory for auditory disability and handicap (AIADH-pt) to characterize the self-perception of hearing difficulties in the domains of detection, sound localization, recognition-discrimination, intelligibility in silence and noise and the total score. Statistical analysis was performed with univariate analysis and distribution of proportions (significance level $p<0.05$*). Results: There was a statistical difference in the results of all AP tests between the groups: PPS G4 < G1,G2 ($p=0.008$*); DPS G4 < G1 ($p=0.02$*); GIN-RE G4 > G1, G2, G3 and G3 > G1,G2 ($p=0.001$*); GIN-LE, G3,G4 > G1,G2 ($p=0.001$*). The AIADH-pt also showed differences in all domains, except for recognition-discrimination. Conclusions: There is a decline in the performance of temporal mechanisms in the adult population, which began in the fourth decade of life, despite preserved audibility thresholds. Furthermore, this outcome is related to a higher occurrence of self-reported hearing difficulties.

P-09
ASSESSMENT OF POSTURAL INSTABILITY, DEPRESSIVE SYMPTOMS, AND QUALITY OF LIFE IN PARKINSON'S DISEASE

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Introduction: Parkinson's Disease (PD) is a progressive neurological condition that causes motor symptoms as muscle stiffness, slowness, tremor and postural instability. This impacts the physical and mental quality of life (QL). Objective: To explore the relationship between QL postural instability and depressive symptoms in patients with PD. Methods: This cross-sectional observational study (Research Ethics Committee approval: 28850619930015138) included a convenience sample of participants diagnosed with PD and and and followed at a Neurology Clinic. Exclusion criteria were other neurological or vestibular diseases and recent medication changes. Postural instability was assessed using the Berg Balance Scale (BBS), QL was evaluated using the Parkinson Disease Questionnaire-39 (PDQ-39), and depressive symptoms were identified using the Geriatric Depression Scale (GDS). Statistical analysis involved measures of central tendency and dispersion, and the Spearman test to assess variable relationships. Data were analyzed using SPSS software (significance level: 5%). Results:The sample consisted of 59 subjects (mean age: 67.81 years, SD=12.55; mean diagnosis duration: 8.33 years, SD=6.50). The diagnosis time was correlated with Activities of Daily Living (ADL) and Total domain of PDQ-39 ($p<0.001$, $r=0.507$; $p=0.023$, $r=0.316$), indicating increasing difficulties and worst QL with disease progression. BBS and GDS were correlacted ($p=0.011$, $r=-0.349$), suggesting more depressive symptoms with worse balance. BBS also correlated significantly with PDQ-39 Mobility domain ($p=0.006$, $r=-0.388$), indicating that poor balance is associated with increased mobility difficulties. GDS correlated with PDQ-39 Mobility ($p=0.038$, $r=0.274$), ADL ($p=0.046$, $r=0.270$), Emotional ($p<0.001$, $r=0.649$), Stigma ($p=0.021$, $r=0.310$), Cognition ($p=0.014$, $r=0.331$), Communication ($p=0.015$, $r=0.326$), Discomfort ($p=0.021$, $r=0.310$), Total ($p<0.001$, $r=0.488$), and Support ($p=0.018$, $r=-0.318$) domains. These findings suggest that PD's physical and psychosocial consequences may increase depression, while family support reduces this risk. Conclusion: QL is influenced by the duration of diagnosis, depressive symptoms, balance impairment and family support.

P-10
APPLICABILITY OF GALVANIC VESTIBULAR STIMULATION IN QUALITY OF LIFE IN PATIENTS WITH PARKINSON'S DISEASE

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INTRODUCTION: Galvanic Vestibular Stimulation (GVS) is a non-invasive method used to stimulate the vestibular system, including vestibular sensors, vestibular nuclei, neural pathways, and cortical areas that receive integrated vestibular inputs. OBJETIVE: The present study aims to evaluate the use of GVS in patients with Parkinson`s Disease (PD) and postural instability for possible improvement of attention volunteering, mood and quality of life. METHODOLOGY: in a clinical study, 30 patients with PD and postural instability in ON phase were submitted to GVS and were evaluated using MEEM, P300, Five Digit Test (FDT), PDQ-39, Geriatric Depression Scale (GDS). The intensity of the electrical current between the mastoids was increased gradually from 1.0 milliamps (mA) to 3.5MA until the 6th session and held until the 8th session. Stimulation time was progressively increased from 9 minutes in the 1st session to 30 minutes in the 3rd session and kept until the 8th session. RESULTS: thirty-one individuals of mean age 69 years and mean duration of the disease of 9 years participated in this study. Analyzing the PDQ-39 questionnaire, a significant improvement in quality of life (QOL) was observed in the dimensions of "cognition" (p=0.012) and "communication" (p=0.013). The continuous variable P300 obtained a significant reduction in tis latency (p=0.026). CONCLUSION: It is believed that GVS interferes with the activities of the pre frontal cortex, as this area also receives vestibular information. This region is important for cognitive processes, thus possibly leading to improvements in attention, planning, and decision making after using GVS. Moreover, by stimulation the vestibular system, GVS can reach other neural networks beyond the sensory ones, such as those involved in attention control and memory.

P-12
THE EFFECT OF HEARING REHABILITATION ON THE RISK OF FALLS IN THE ELDERLY

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Introduction: The human aging process causes significant changes in functional, structural and sensory terms. Among these changes, hearing loss appears as one of the most prevalent chronic conditions, which can increase the likelihood of imbalances and a history of falls. Purpose: Analyze the effect of auditory rehabilitation on the risk of falls in elderly people with age-related hearing loss. Material and methods: This is an uncontrolled single group intervention study. Fifteen elderly users of sound amplification devices receiving care at a Specialized Clinical Center were evaluated. To collect data, the TUG (Timed Up and Go Test) was applied, which assesses the risk of falls and body balance in the elderly. Two assessments were carried out, one at the time of hearing aid placement and the second, after 6 months. The research was approved by the Research Ethics Committee of the home institution under Number 5.690.286. Results: The majority of the sample was made up of men (73.3%), with a mean age of 75.6 years and hypertensive (60%). Of the total sample, 46.7% reported fear of falling, while the number of falls occurring after 6 months of rehabilitation went from 13% to zero. In the present study, although the comparisons of the TUG test between the pre- and post-rehabilitation moments did not show statistical significance (p=0.62), the findings still reveal an improvement in the performance of the elderly in the test after 6 months of rehabilitation. Conclusion: Based on this research, we can conclude that auditory rehabilitation, although it improved the performance of the elderly in the TUG, did not change the risk of falls, but, in relation to the occurrence of falls, we observed its absence after rehabilitation. Therefore, it is suggested to expand studies on the topic with larger samples and longer-term follow-up, so that the influence of auditory rehabilitation on the risk of falls can be better investigated. It is noteworthy that the identification of predictive factors is essential for the development of preventive measures, which can result in a reduction in falls and an improvement in the quality of life of the elderly.

P-13
SAAAT and DDT in university students, without hearing complaints, before and after academic activities.

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Introduction: Situations of mental effort and emotional state negatively affect the performance of auditory skills, such as attention, essential for the development of language and reading and writing skills. In the academic context, Sustained Auditory Attention (SAA) and Background Figure (BF) are crucial to avoid distractions and maintain focus on relevant auditory information. Purpose: To compare the findings of the Sustained Auditory Attention Ability Test (SAAAT) and the Dichotic Digit Test (DDT), in university students, in order to identify whether these tests change response patterns, before and after a period of academic activities. Methods: This is an intra-subject experimental study, which was approved by the Human Research Ethics Committee of the Pontifical Catholic University of Minas Gerais, under opinion n° 5.845.658. We surveyed 30 students from a private university in Minas Gerais, of both sexes, aged between 18 and 30, enrolled in the morning and afternoon shifts. Individuals who presented self-perception of Stress, Anxiety and Depression outside of normal standards according to the Depression, Anxiety and Stress Scale (DASS-21), in addition to auditory and vestibular complaints and/or changes in audiological exams, were excluded. Participants were evaluated before and after their academic activities, using the SAAAT and DDT tests in an acoustic booth. Results: SAAAT values were higher (worse) and DDT values lower (worse) after academic commitments, especially in the afternoon. As for DDT, there was a difference between the results when compared by shift, showing higher (better) values for OE in the afternoon. Conclusion: The study evaluated the SAAAT and DDT values before and after academic activities, showing that the minimum time of 190 minutes was enough to reduce the individuals' performance in the tests.

P-14
SELF-PERCEPTION OF STUTTERING AND SELF-PERCEPTION OF HEARING IN PEOPLE WHO STUTTER: AN ASSOCIATION ANALYZE

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Introduction: Stuttering is a communication disorder with various manifestations that can negatively affect a person's quality of life. Brain mapping studies have demonstrated that there are differences in areas related to the processing of auditory information, including hypoactivity in the superior temporal gyrus and cognitive mechanisms involved in the auditory perception of adults who stutter, compared to the people who do not stutter. Objective: This study investigated the association between self-perception of stuttering and self-perception of hearing in Brazilian adults who stutter. Methods: Fifty-five adults who stutter (ages 18 to 58 years), speakers of Brazilian Portuguese, participated in an observational study (CAAE: 40843220.3.0000.5149) that included: (a) a clinical history survey to collect identification and clinical data; (b) a hearing self-perception questionnaire (Speech, Spatial and Qualities of Hearing Scale – SSQ, version 5.6); (c) self-perception of the impact of stuttering (Brazilian Portuguese version of the Overall Assessment of the Speaker's Experience of Stuttering – Adults – OASES-A). Data analysis consisted of descriptive and bivariate analysis using Kruskal-Wallis and Spearman correlation coefficient. Results: Most participants were classified as moderate to severe in the total classification of the impact of stuttering (OASES-A). The association between the total classification of the impacts of stuttering and self-perceived hearing with the Kruskal-Wallis test indicated a statistically significant association only in part 1 (Speech Hearing), question 14, which refers to the ability to talk to someone on the phone and someone else near them at the same time (p = 0.019). The Nemenyi test verified that the difference was between the mild/moderate and severe classifications (p = 0.015), with a higher median in the mild/moderate one. The correlation analysis between the total score of the impacts of stuttering and part 1 (Speech Hearing) of self-perceived hearing (SSQ) revealed statistically significant weak negative correlations. In part 3 (Qualities of Hearing), the correlation analysis – likewise with the Spearman correlation coefficient – revealed a statistically significant weak negative correlation between the total effect of stuttering and question 16 (0.380). Conclusion: Self-perception of auditory abilities was greater to the extent that self-perception of the impacts of stuttering on quality of life was lower.

P-15
ASSESSMENT OF HEARING AND COGNITION IN ADULTS WITH PARKINSON'S DISEASE: A COMPARATIVE RESEARCH

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Introduction: Parkinson's disease (PD) results from a marked decrease in dopamine in the central nervous system. As a consequence, it can generate motor and non-motor complications, including cognitive and audiological assessments in patients. Therefore, the objective of the present study was to describe and compare the audiological and P300 profile of patients with and without Parkinson's disease. Methods: this is an observational study of the type comparative cross-sectional study, approved by the Research Ethics Committee number CAEE 8850619.9.0000.5149. Individuals between 40 and 90 years old participated in the study; were included patients with and without PD; Participants who had diagnosis of other degenerative diseases, cognitive decline already diagnosed, and individuals with conductive loss. The scales were applied Mini Mental State Examination, Geriatric Depression Scale, Parkinson's Disease Questionnaire PDQ-39, immittance testing, pure tone audiometry and P300. The Mann Whitney test was used to compare groups. Preliminary Results: to date, the study has 41 participants, 56% male, median age of 67 years, and 5 years of education, 36 participants with PD and 5 without PD. In the group with PD, the average disease duration was 5.5 years and the median PDQ was 48 points. Comparison of pure tone audiometry thresholds between groups indicated difference in relation to frequencies of 2KHz (p=0.037), 3KHz (p=0.008), 4KHz (p=0.002), 6KHz (p=0.008) and 8KHz (p=0.004) in the right ear and in 4KHz (p=0.003), 6KHz (p=0.003) and 8KHz (p=0.010) in the left ear. Furthermore, the PD group presented increased P300 latency when compared to the group without Parkinson's (p=0.049). Final considerations: there is possibly a relationship between the frequency of hearing loss, cognitive decline and PD. The expansion of the control group will allow achieving the objective of the study. 42 will be included PD patients and 42 controls.

P-16
AUDITORY PROCESSING, COMPLAINTS OF SCHOOL DIFFICULTIES, AND INDICATORS OF RISK FOR HEARING LOSS AT BIRTH

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Introduction: Indicators of risk for hearing loss (IRHL) at birth may be related to potential auditory processing disorders, which, in turn, can lead to learning difficulties. Objective: To verify the association between auditory processing screening results and the presence of complaints of school difficulties in children with and without indicators of risk for hearing loss at birth. Methods: Case-control study, approved by the ethical board of the Institution under protocol n° 934,475. A total of 143 children aged between 7 and 9 years (mean 7.12) were evaluated, divided into G1: composed of 71 children with IRHL at birth, 40 (56.3%) girls, and; G2 composed of 72 without IRHL, 41 (56.9%) girls. All included children had normal audiometry and immittance. Auditory processing screening (APS) was performed: Sound Localization (SL) in 5 directions, Sequential Memory for Verbal Sounds (SMVS), and Sequential Memory for Nonverbal Sounds (SMNS). APS was considered normal when the child performed correctly in the three skills tested: SL, SMVS, and SMNS Parents or guardians reported on possible school complaints. Data were analyzed using descriptive statistics and association through the Chi-square test, using the Statistical Package for Social Sciences (SPSS) version 23.0. A significance level of 5% ($p \leq 0.05$) was adopted. Results: Regarding APS, G1 (without IRHL) presented 2.8% (n=2) altered results and G2 (with IRDA) 11.3% (n=8). Regarding complaints of school difficulties, G1 presented 4.2% (n=3) and G2 16.9% (n=12). The association test between APS (normal or abnormal) and presenting or not IRHL at birth revealed statistical significance (p value = 0.047), as well as IRHL and presence or absence of complaints of school difficulties (p value = 0.013). Comparison of APS results and school complaints also showed statistical significance in the analysis of the two groups: G1 - p value = 0.01 and G2 p value = 0.00. Conclusion: In the studied population, auditory processing disorders and school complaints were associated with IRHL at birth. However, auditory processing disorders were related to school difficulties regardless of IRHL. Therefore, auditory monitoring, including auditory processing assessment, can contribute to intervention in learning difficulties.

P-17
THE USE OF QUESTIONNAIRES TO DEFINE THE RISK OF AUDITORY PROCESSING DISORDERS: WHAT IS THE AGREEMENT OF THE SCREENING INSTRUMENTS?

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Introduction: Auditory processing refers to the processes and mechanisms that occur in the auditory system in response to sound stimuli, responsible for localization, discrimination, lateralization, recognition of auditory patterns and interpreting sound events. Auditory Processing Disorder concerns the deficit in the neural processing of auditory stimuli and may be associated with changes in language development and/or neurological conditions. This disorder can result in school difficulties and linguistic impairments. In this sense, it is extremely important to identify and evaluate children who present school difficulties early and check whether they are at risk for the disorder. Since the 1980s, scientific research has sought to identify an effective battery of protocols for screening auditory abilities, as there is no single gold standard procedure used for this purpose. The use of behavioral questionnaires makes it possible to extract qualitative information that may be related to auditory disorders and assist in screening for possible changes in auditory processing in children with school difficulties. Objective: To verify the agreement between the questionnaires Fisher Auditory Problems Cheklist for Auditory Processing Evaluation (QFISHER) and the Scale of Auditory Behaviors (SAB) Methods: This was a cross-sectional analytical observational study, carried out with children and adolescents aged 10 to 14 years, monitored by the pediatrics service of the University Hospital. The research was approved by the ethics committee (3,085,362). Development: Patients underwent tonal audiometry and immittance testing and two behavioral questionnaires were administered to screen auditory processing. The Kappa Coefficient Test was used. Results: 81 adolescents with normal audiometry participated in the study. QFisher was applied to 81 participants and SAB was applied to only 54, due to the stoppage of collection due to the Covid-19 pandemic. The application of the QFisher questionnaire indicated that 19 adolescents (23.4%) needed a complete assessment of auditory processing and the SAB identified 11 adolescents (26.8%). The agreement analysis between the QFisher and SAB questionnaires revealed a significant agreement of moderate magnitude (0.593). Conclusion: The study found that the degree of agreement between the behavioral central auditory processing screening questionnaires, QFisher and SAB, was moderate.

P-18
AUDITORY PROCESSING DISORDERS IN CHILDREN DIAGNOSED WITH CONGENITAL TOXOPLASMOSIS

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Introduction: Congenital Toxoplasmosis is a parasitic disease transmitted from mother to fetus, which may affect, among other consequences, peripheral and central auditory regions. Central Auditory Processing Disorder (CAPD) concerns the deficit in the neural processing of auditory stimuli. This disorder can result in school difficulties and language impairment. In this sense, it is extremely important to identify and evaluate children diagnosed with Congenital Toxoplasmosis and check whether they are at risk for CAPD, as well as the incidence of this disorder in this population. Objective: To verify the incidence of central auditory processing disorder in children diagnosed with Congenital Toxoplasmosis and describe its features in the studied population. Methods: This was a cross-sectional analytical observational study, carried out with children and adolescents aged 10 to 14 who are monitored by the pediatrics service of the University Hospital. The research was approved by opinion number 3,085,362. Development: The patients underwent audiometry and immittance testing and two behavioral questionnaires were administered to screen for CAP disorder and those who were at risk for CAPD underwent CAP assessment. Results: Of the 12 patients evaluated, all showed changes in at least one of the CAP skills, showing a prevalence of 14.81% of CAPD in this population. From the assessment of the incidence of CAP in these children, it was found that auditory closure was abnormal in 25%; dichotic listening showed abnormal results in 75%; temporal processing was abnormal in 91.7% and binaural interaction in 33.3%. Conclusion: Congenital toxoplasmosis is a risk factor for Central Auditory Processing Disorder (CAPD). Notably, the skills most affected by this condition were temporal processing and dichotic listening, respectively, and questionnaires have been shown to have greater sensitivity for screening risk behaviors in these skills. The use of behavioral questionnaires proves to be an important tool for screening the risk of CAPD, being easy to apply and playing a relevant role in diagnosis and early intervention.

P-19
RESULTS OF A META-ANALYSIS ABOUT THE EFFECT OF MELATONIN ON OTOPROTECTION IN RODENTS

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Objectives: To determinate the otoprotective efficacy of melatonin in experimental models of rodents through a meta -analisys preceded by asystematic review of the literature. Methods: At first it was realized a systematic review that met the inclusion criteria for the next step: a quantitative synthesis. The data extracted for the meta-analysis were organized according to the standard hearing frequencies presented in each study. Those that were analyzed by at least three studies were grouped to compose each outcome. Thus, the auditory frequencies evaluated as outcomes were 1500, 2000, 3000, 4000, 5000, 6000, and 8000 Hz. Numerical data analysis was performed and reported according to Review Manual 5.4 (Cochrane-Collaborating Center, Denmark). The mean difference was used as a measure of effect. A random effects model was fitted to the data. Heterogeneity (tau^2) was estimated using the restricted maximum likelihood estimator (Viechtbauer 2005). In addition to the estimation of tau^2, the Q-test for heterogeneity (Cochrane 1954) and I^2 statistics were reported. The random effects model was used for the detected outcomes with high heterogeneity (i.e., $tau^2 > 25$). Results: Seven articles were selected, and four were included in the meta-analysis. It was possible to obtain seven outcomes according to the standard auditory frequencies presented among the studies, considering a minimum of three standard frequencies. The outcomes analyzed were for the frequencies of 1500, 2000, 3000, 4000, 5000, 6000, and 8000 Hz. Conclusion: Melatonin can provide protection against the ototoxic effects of cisplatin and aminoglycosides at 5000 Hz, 6000 Hz, and 8000 Hz, there by minimizing the reduction in Otoacustic Emissions (OAE) amplitude. The same effect was not observed in the lower frequencies. Despite the limited number of studies that were evaluated, the results appeared consistent in higher frequencies. However, the methodology of the available studies did not meet the necessary methodological rigor that promotes the safe replicability of these studies.

P-20
SCREENING FOR VESTIBULAR COMPLAINTS IN CHILDREN UTILIZING DIZZINESS HANDICAP INVENTORY AND PEDIATRIC VISUALLY INDUCED QUESTIONNAIRE

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Introduction: Vertigo and dizziness are frequently overlooked symptoms in childhood, often associated with diseases of adulthood or the elderly. However, they can signify significant conditions such as Recurrent Vertigo of Childhood and Vestibular Migraine of Childhood. Diagnosing vestibular changes in children remains challenging, contributing to sparse records of dizziness in this age group. Hence, there is a need for studies aiming to identify and diagnose these alterations. Objective: This study aims to identify vestibular changes in children using screening instruments like questionnaires tools. Method: Study was approved by an ethics committee from a University under the number 4003.300. A diagnostic, observational, and cross-sectional study was conducted, employing a translated and adapted version of the Pediatric Visually Induced Questionnaire (PVID) from English into Portuguese, translated and adapted in another studied and the Dizziness Handicap Inventory for children (DHI), already adapted for the Portuguese language. The PVID, DHI, and Videonystagmography (VENG) were administered to two groups of children from 6-17 years (mean 12.4 SD 3.4) divided into a control group without vestibular complaints (n=30) and a study group with recent vestibular complaints (n=31). Mann Whitney test was applied to evaluate responses between the two groups. Results: The group with vestibular complaints exhibited significant altered results in the DHI, PVID in almost every question and in the mean score compared to the group without complaints. VENG had anormal results in all children with vestibular complaints. Conclusion: The PVID and DHI questionnaire emerges as a valuable tool for assessing dizziness and vertigo in children and adolescents, particularly as a screening test preceding other otoneurological exams.

P-21
ASSOCIATION OF HEARING DEVICES USE, FAMILY ADHERANCE AND LIFE QUALITY OF CHILDREN WITH HEARING LOSS

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Introduction: The article investigates the impact of hearing on language acquisition and hearing loss on children, utilizing the PedsQL questionnaire to assess the quality of life of children with hearing impairments using hearing aids or cochlear implants. Early intervention with these devices is crucial for language development due to potential impacts on speech, cognition, and reading. Objective: The aim is assess the quality of life of children who use hearing devices, as perceived by their parents or guardians, and to relate it to the development of the child's auditory skills in speech perception during a monitoring assessment. METHOD: It is a clinical, evaluative, and quantitative study with a sample of 8 children aged 4 to 12 years, diagnosed with hearing loss, using hearing aids for at least six months, and regularly attending rehabilitation sessions. The Pediatric Quality of Life Inventory (PedsQL) was used to gauge parents' perception of their children's health-related quality of life. Results: Results showed higher PedsQL scores indicating lower health-related quality of life, particularly in the school domain, while lower scores indicated enhancements in children's health and daily activities. Longer usage of hearing aids positively influenced auditory skills development, correlating with school performance and parental perception of quality of life. Conclusion: The study emphasizes the connection between children's quality of life with hearing devices and their level of auditory stimulation, advocating for comprehensive hearing rehabilitation addressing emotional, physical, and social aspects, despite challenges like bullying and exclusion in the school environment. The study was carried out in the Educational Audiology Sector of the Speech-Language Pathology and Audiology School Clinic after approval as determined by Resolution N°. 466/12 of the National Health Council.

P-22
ASSESSMENT OF COMPLAINTS REGARDING AUDITORY SKILLS IN INDIVIDUALS WITH AND WITHOUT TINNITUS

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Introduction: Tinnitus affects approximately 15% of the world's population. It may be associated with various complaints in individuals with or without hearing loss. Its etiology is multifaceted, which may include neuroplasticity alterations in the central auditory nervous system, which can adversely affect several auditory skills, such as sound localization and speech intelligibility in noisy environments. Objective: To compare complaints in listening skills or situations between individuals with and without tinnitus. Methods: The present research was approved by the Ethics Committee on Research with Human Beings, opinion number. 5.293.750. This is an observational and cross-sectional study. The sample consisted of 67 participants (36 male and 31 female), aged between 61 and 91 years old (mean of 74.3±7.40 years), diagnosed with hearing loss and, no previous experience with the use of hearing aids. The sample was selected according to the scheduled demand for the audiological screening of the Unified Health System (Portuguese acronym, SUS) at the Speech-Language Pathology Clinic in the involved institution. The Amsterdam Inventory for Auditory Disability And Handicap (AIADH) questionnaire was applied for self-assessment of complaints in listening skills or situations. Participants were asked about the presence or absence of tinnitus, dividing them into two groups: tinnitus (GT) or control group, without tinnitus complaint (GC). Results were analyzed in a descriptive and analytical (Shapiro-Wilk tests and non-parametric Mann-Whitney test, with a significance level of 5% - $p<0.05$). Results: Of the total, 47 participants reported tinnitus (33 bilaterally, 05 only in the right ear, and 09 in the left ear), while 20 reported no tinnitus. The total AIADH score had a median of 59.0 (interquartile range: 25th=48.0/75th=68.0) for GT and 47.5 (25th=32.5/75th=62.3) for GC. Significant differences were observed between GT and GC in the scales of localization ($p=0.042$) and speech intelligibility in noise ($p=0.040$). GT had a median score of 12.0 (25th =9.0/75th=13.0) on the localization scale, whereas GC scored 9.0 (25th=5.0/75th=11.0). Regarding speech intelligibility in noise, GT scored a median of 13.0 (25th=12.0/75th=14.0) and, GC scored 10.5 (25th=9.0/75th=14.0). Conclusion: Participants with tinnitus exhibited greater difficulties in sound localization and speech intelligibility in noise compared to those without tinnitus complaints.

P-23

HEARING LOSS AND TINNITUS IN INDIVIDUALS INFECTED WITH HTLV-1: COMPARATIVE STUDY

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Introduction: Human T-lymphotropic Virus Type 1 (HTLV-1) was the first human retrovirus discovered, with modes of infection including hematogenous, sexual, and vertical transmission. There are descriptions of various clinical manifestations, with one of the main ones being HTLV-1-associated myelopathy (HAM), although 90% of individuals do not present clinical manifestations. HAM affects structures such as the cerebellum, brain, brainstem, and spinal cord, with the lower thoracic spinal cord being the most affected area. Studies suggest that individuals infected with the virus generally have more complaints of hearing loss, ear fullness, dizziness, and tinnitus compared to uninfected individuals, indicating a possible impact on the auditory pathway. Additionally, HTLV-1 infection appears to be associated with hearing loss, especially in those with clinical presentation, but there is a scarcity of research investigating such complaints. Purpose: To evaluate the hearing of individuals infected and uninfected with HTLV-1. Methods: An observational comparative study that evaluated the frequency of complaints of hearing loss, tinnitus, and audiological diagnosis among the groups, elaborated according to the National Health Council (NHC) and submitted for review and approval by the Ethics Committee of Fundação Hemominas, number 290, and the Ethics Committee of the Federal University of Minas Gerais (UFMG), according to opinions nos. 2,898,825 and 0437.0.203.000-10. Results: The study included 114 participants, with 58 controls, 28 asymptomatic individuals, and 28 with HAM, and found a larger population of infected women. There was no statistically significant difference when comparing age, gender, diabetes, hypertension, and hypo/hyperthyroidism. However, depression is more frequent in individuals with HAM. The results indicate a statistically significant difference in the comparison of tinnitus complaints, with a higher percentage in the HAM group, followed by the asymptomatic group. The HAM group had a higher frequency of medication use. The results of tonal audiometry and LRF test did not indicate significant differences, however, the IPRF values indicate a statistically significant difference between the asymptomatic and HAM groups when compared to the control group. Asymptomatic individuals stood out with a high prevalence of partially present acoustic reflexes, followed by the HAM group with a high prevalence of total absence. Conclusion: These findings may indicate retrocochlear alterations associated with HTLV-1.

P-24
RELATIONSHIP BETWEEN LISTENING SKILLS AND THE READING LEARNING PROCESS

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Introduction: There is a relationship between reading difficulties and auditory temporal processing skills, both in ordering and temporal resolution and also figure-ground for verbal sounds and auditory closure. School complaints and learning or language disorders are being related to poor performance in auditory processing tests, in dichotic tests such as the dichotic digit test, low-redundancy monotic tests such as the SSI and diotic tests, such as the sound localization test. Objective: To verify the association between predictive skills for the development of reading and listening skills in students in the 2nd year of Elementary School. Methodology: The research was approved by the Institution's Ethics Committee under no. 3,906,514. The Early Identification of Reading Problems (IPPL) protocol was applied with alphabet, rhymes, syllables, phonemes, phonological working memory, reading and listening comprehension tests and the simplified auditory processing assessment (ASPA) tests to associate performances, in 2nd year elementary school students. Results: 58 children from the 2nd year of public school, aged between 6 and 8 (average 6,65 years - sd 0,57), participated. In the simplified processing assessment, altered performance was observed in 24 children (41%) for the sound localization ability, in 28 students (48.3%) for the verbal sequential memory auditory ability and 26 (44.9%) for the auditory ability of non-verbal sequential memory. Performance on the IPPL was better among children with adequate performance on each ASPA task, with a statistically significant association between the IPPL and verbal sequential memory (p=0.027). Children, with at least one change in auditory skills, had a lower IPPL average. Conclusion: The relationships between hearing and the process of learning to read appear to be measurable, but require further investigation, relating causes, effects and synergisms between reading prerequisites and listening skills.

P-25
AUDITORY PROCESSING IN MONOLINGUAL AND BILINGUAL SUBJECTS: SSW AND DD TESTS

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Introduction: A bilingual person is someone who has the competence to satisfactorily carry out all the activities necessary for communication in two languages. It is believed that the individual's exposure to this context can have impacts on cognitive aspects, as well as being associated with anatomical and physiological changes in the brain. Therefore, the effects of knowledge of two languages on brain processing have gradually received more attention from the scientific community. Research seeks to understand how the brain processes and organizes information in bilingual subjects and the impact of learning a second language on different aspects specifically the possibility of modifying auditory processing skills. Objective: Evaluate and compare the performance of auditory skills in bilingual subjects who speak Brazilian Portuguese-English, with Brazilian Portuguese as their first language, and monolingual subjects who speak Brazilian Portuguese, using the DD and SSW auditory processing tests. Methods: 50 normal-hearing volunteers were evaluated, aged between 19 and 41 years (average 24.2 ± 4.4 years). Participants were allocated into two groups: Monolingual Group (GM) composed of 25 participants and the Bilingual Group (GB) composed of 25 participants. They were subjected to the Dichotic Digit (DD) and Staggered Spondaic Word (SSW) tests. The work was approved by the Local Ethics Committee (2.197.951/2017). Study funded by the Federal District Research Support Foundation - FAPDF 00193.001538/2017. Results: In the directed listening and binaural integration activities of DD test there was a significant difference for the intragroup and intergroup analysis on the right, with superior performance of GB. In the SSW test, the intergroup analysis was not significant, however the intragroup comparison in the different conditions (EC, DNC, DC and ENC) showed significant values for both groups. Regarding the order effect, GB performed better in the high/ low condition. The auditory effect, in the intragroup and intergroup comparison, showed a difference for the GB, with superior performance of the left ear. Conclusion: Bilingual participants showed better attentional control and bilateral hemispheric dominance for the stimuli presented. It was also possible to observe the advantage of the right ear for adult participants.

P-26
ONLINE AUDITORY TRAINING FOR CHILDREN - DESCRIPTION OF THE PRODUCT DEVELOPMENT PROCESS

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Introduction: Auditory training involving central auditory processing skills has garnered evidence in recent years, particularly in the rehabilitation of Central Auditory Processing Disorder. In the online activity modality, research endeavors aiming to examine the effectiveness of these resources have yielded promising results. There are few programs that offer remote auditory skills training for free; when found, they are geared towards individuals using hearing aids or cochlear implants. Objectives: To develop an online product with free activities for auditory training, enhancement of auditory skills, and therapeutic potential in cases of Central Auditory Processing Disorder in children. Methodology: This is a project for the development of online resources, application of new technologies, and innovation for auditory training in children, funded by a PIBITI scholarship from FAPDF. The methodology for technological development will involve the following steps: 1) Planning; 2) Compilation of available technological tools for computerized auditory training; 3) Development of interactive digital resources in computerized auditory training; 4) Implementation of activities in the digital environment; 5) Product functionality testing; and 6) Dissemination and accessibility. Upon completing step 3, the project will be submitted for validation to the Research Ethics Committee. Results: To achieve the objective, we have completed the following milestones; analysis of available technological tools for computerized auditory training in children; integration of interactive digital resources with auditory skills to be addressed; and we are currently in the stage of developing interactive digital resources in computerized auditory training, combining theoretical framework with technology tools, multimedia resources, and gamification. Conclusions: The current stage requires constant testing and adjustments to enhance the developed resource. The relevance of the scenario has motivated the project to develop a new, accessible product aimed at stimulating auditory skills in children with or without a diagnosis of Central Auditory Processing Disorder, complementing therapeutic interventions for Central Auditory Processing Disorder, enabling auditory skills training at home, promoting a better quality of life, and consequently contributing to the academic and social performance of numerous children across the country.

P-27
GROUP AUDITORY REHABILITATION - A CURRICULAR INTERNSHIP EXPERIENCE

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Introduction: The aural-oral method is utilized as a form of auditory rehabilitation that enhances central auditory skills and language, cognition, and speech intelligibility. Auditory rehabilitation significantly impacts the quality of life of assistive technology users, primarily focusing on audibility, as well as communication and oral proficiency. Objectives: To describe the experience of Speech-Language Pathology students in a supervised curricular internship setting in auditory rehabilitation for users of hearing aids and cochlear implants in group settings. Methodology: The speech therapy intervention carried out by the students involved group auditory rehabilitation for children using the aural-oral method. This intervention took place from august 2023 to april 2024, conducted by students in the 7th and 8th semesters of the course. The groups consisted of three to five children of similar ages, with comparable language development and auditory skills. The age range of the groups varied from 7 to 12 years old. Results: During the speech therapy intervention based on an integrative literature review, it is important to highlight that auditory rehabilitation should engage children actively during their auditory training. Therefore, it is necessary for the therapeutic planning to consider the playful and functional nature and the progressively increasing difficulty level of activities, based on the skills being addressed. The sessions were designed to develop auditory, cognitive, linguistic, and communicative skills through interaction with others, combined with the use of auditory training techniques tailored to each developmental level and age group. Various themes were incorporated into auditory rehabilitation, such as activities of daily living, hygiene, spatial-temporal orientation, future planning, professions, finances, holidays, Brazilian popular culture, and care for assistive technology devices. The experience allowed us to observe the process within each group, including the development of autonomy, interaction with others, spontaneous speech, and adaptability in various communicative contexts, as well as active listening, with a positive impact on communication, auditory skills, attention, and independence of the children. Conclusions: The child-centered therapeutic approach in group settings and intervention strategies that involve experiencing everyday situations, such as symbolic play, enable the child to become the protagonist of their own development by fostering active participation in the group. The group becomes a space for identification, motivation, bond creation, and inclusion.

P-28
AUDITORY SKILLS STIMULATION IN GROUPS OF CHILDREN USING HAS AND CIS - EXPERIENCE REPORT

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Introduction: Central auditory processing refers to how the brain perceives and processes the acoustic information received through hearing. In the intervention and monitoring of children using hearing aids (HAs) and cochlear implants (CIs), work to develop auditory skills is crucial, involving identification, localization, lateralization, discrimination, recognition, and auditory comprehension. Objective: To describe the stimulation of auditory skills in groups of children using HAs and/or CIs, participants in an auditory rehabilitation program. Methods: This is a description of the impact of auditory skills stimulation in auditory rehabilitation group situations, with children aged 7 to 12 years using HAs and/or CIs in a Specialized Auditory Rehabilitation Center in Brasília/DF during an eight-month supervised curricular internship. For group therapy selection, the functionality of auditory and language skills is considered, and for group composition, children's leveling, age relevance, and auditory and speech development are relevant. Results: Considering the internship experience and relating it to the integrative review, it was observed that, regarding auditory skills, the group provides a less controlled communicative space than individual therapy. Interaction between children and interns enables work on divided and alternating auditory attention, auditory closure, vocabulary and linguistic expansion, metacognitive and metalinguistic skills, providing more efficient communication for daily life. Spontaneous communication situations in the group allow children to perceive their auditory difficulties and communication strategy needs for figure-ground control, also engaging in self-advocacy for communication with better signal-to-noise ratio or fewer competing sources. In the interns' action plan, therapeutic goals for hearing, speech, language, and cognition were developed, specific to each group, according to the users' demands. Conclusion: Thus, it was observed that group therapy is beneficial for the children attended, consistent with the literature. The observed results encompassed satisfactory interaction and motivation, especially for auditory skills favored by the group and pragmatic aspects of language and speech. However, controlling specific demands to be improved during therapy is still considered a challenge, requiring further strategies.

P-29
PERCEPTION OF AUDITORY SKILLS AND VOCAL SYMPTOMS IN CHILDREN WITH BEHAVIORAL DYSPHONIA

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Introduction: Children with behavioral dysphonia may also have Central Auditory Processing Disorder (CAPD), with changes mainly in temporal auditory skills. This results in challenges in recognizing broader speech characteristics and processing voice frequency, intensity, and duration. The use of a self-perception questionnaire in auditory processing screening batteries has been recommended to assist in screening, evaluation and treatment planning in these cases. Purpose: Compare a self-perception questionnaire on auditory skills applied to children with behavioral dysphonia with the perception of auditory and vocal symptoms, as well as with performance in temporal tests of auditory processing. Methods: This is a quantitative, descriptive and transversal study (CEP #4.734.688). 17 children, 6 to 8 years old, with a diagnosis of behavioral dysphonia participated. Peripheral hearing loss, severe visual impairment, language or neurodevelopmental disorders were excluded. Pediatric vocal symptoms questionnaire - QSV-P"; self-perception questionnaire of auditory skills (QAPAC) inserted into the online program AudBility both self-assessment and parental versions; basic audiological evaluation and temporal tests - Random Gap Detection Test (RGDT) and Frequency Pattern (FPT) were applied. Parents' and children's responses were compared and Spearman's correlation measured correlation between the QAPAC and the QSV-P, as well as between questionnaires and temporal tests. Results: QAPAC self-assessment version showed an average score of 45.5+7.4, wherein seven (41.2%) children scored below the risk criteria for Central Auditory Processing Disorder (CAPD). The average score on the parental version was 39.5+10.5, with 11 (64.7%) responses falling below the risk criteria. Parents' average score was statistically lower (worse) compared to that of the children ($p<0.005$). A robust correlation surfaced between the self-assessment versions of QAPAC and QSV-P ($r=0.671$), alongside the parental versions ($r=0.722$). A poorer performance of the left ear in comparison to the right ear was observed in the TPF test ($p<0.005$), and a moderate correlation between QAPAC and TPF in the left ear during the imitation phase was noted ($r=0.597$). Conclusion: The QAPAC proved to be useful in composing an initial voice assessment protocol in children with behavioral dysphonia.

P-30
TINNITUS AND LOUDNESS RECRUITMENT IN PEOPLE WITH DEMENTIA

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Background: Tinnitus and loudness recruitment are often associated with hearing loss. There are few studies on these hearing symptoms in people with dementia. Objective: To investigate the occurrence of complaints of tinnitus and loudness recruitment in patients with dementia and evaluate possible relationships with hearing acuity. Methods: Observational study carried out with individuals treated at a cognitive neurology outpatient clinic. The inclusion criteria were the patient's ability to answer the questions "Do you feel tinnitus/noise in your ears or head?" and "Do you feel uncomfortable with very loud sounds", and respond to audiometry. Descriptive analysis was performed. Research Ethics Committee 5,626,511. Results: Overall 187 patients answered the anamnesis questions. We observed that 70 (37.43%) patients reported tinnitus and 68 patients (36.36%) reported discomfort with loud sounds. 30 subjects (16.04%) reported tinnitus and discomfort at loud sounds concomitantly. The severity of the dementia condition made it impossible to perform audiometry on all patients who complained of tinnitus and discomfort with loud sounds. Of the 70 who complained of tinnitus, it was possible to perform audiometry on 62 patients and among these, hearing loss was detected in 54 (87.10%). Of the 68 who reported being bothered by loud sounds, 56 had hearing loss (82.35%). Discussion: In our study, 37.43% reported tinnitus and 36.36% reported discomfort with intense sounds. The prevalence of tinnitus complaints in the general population varies greatly, between 4.4 and 15.1% in adults and 22.2% in the older adults. In our analysis, 82.35% of subjects who were bothered by loud sounds had hearing loss. The mechanism by which intensity recruitment leads to discomfort is still debated, but most research indicates that it may be related to cochlear injury. The perception of tinnitus and discomfort at loud sounds may also have been altered due to the patients' cognitive conditions. Conclusion: The majority of dementia patients who report tinnitus or discomfort at loud sounds have hearing loss. More studies need to be carried out to better characterize hearing symptoms in dementia and develop therapeutic strategies.

P-31
CROSS-CULTURAL ADAPTATION OF THE SPATIAL HEARING QUESTIONNAIRE FOR BRAZILIAN PORTUGUESE

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Introduction: Spatial hearing is the ability to locate and segregate different sources of sound. It refers to an individual's ability to receive, process, and utilize directionally specific auditory signals from both ears, working independently or together. In Brazil, there are no available tests to exclusively assess spatial hearing. Objective: To carry out the translation, adaptation, and validation of the Spatial Hearing Questionnaire (SHQ) into Brazilian Portuguese. Methods: This is a methodological study approved by the ethics committee of a public university (CAEE 17962919.6.000). The SHQ was translated into Portuguese by two Brazilian translators and back-translated by two native English translators. The responses were analyzed by a panel of experts, and a second version was created. Subsequently, semantic validation was conducted, involving the application of the translated version to 30 individuals to identify comprehension difficulties related to the questions. After this step, the translated version was restructured, leading to the final Portuguese version. Afterwards, the SHQ and Spatial and Qualities of Hearing Scale (SSQ) questionnaires were administered to 126 individuals seen at the audiology service of a public hospital. All participants had normal hearing and underwent the Mini-Mental State Examination for cognitive screening. Of the total participants, 10% were subjected to questionnaire reapplication to assess response consistency at different times. Results: The sample comprised 126 individuals with a mean age of 39.4 years, with 103 (81.7%) females and 23 (18.3%) males. Semantic validation showed less than 20% of "did not understand" responses for all questions, indicating good question comprehension by individuals. Upon SHQ reapplication in 10% of the sample, the Wilcoxon test revealed no significant differences in responses, and the Spearman coefficient showed high correlation in responses. The Cronbach's alpha coefficient showed high values in all scales (>0.9), indicating good internal consistency among all questionnaire items. Conclusion: The cross-cultural translation, adaptation, and validation of the SHQ demonstrated high reliability, making it a valid instrument with cultural equivalence for Brazilian Portuguese. Acknowledgments: To Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brazil, for their support in the development of this research (Research Productivity Grant number 308302/2022-2).

P-32
SPATIAL HEARING ABILITY, DISCOMFORT WITH HEARING, AND COGNITIVE FUNCTION IN INDIVIDUALS WITH AND WITHOUT TINNITUS

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Introduction: According to the World Health Organization, tinnitus is a symptom affecting approximately 278 million individuals worldwide, clinically characterized by the sensation of sound perception without the presence of an external sound source. Some studies suggest that tinnitus can impair spatial hearing by interfering with the accuracy of calculations needed for proper sound localization. Objective: To compare the responses of individuals with and without tinnitus complaints regarding self-perception of spatial hearing, cognition, and discomfort with their hearing. Methods: This is an analytical cross-sectional study approved by the ethics committee of a public university (CAEE 17962919.6.0000). The study included 123 individuals with normal hearing, among whom 22 had tinnitus complaints, and 101 did not. The results of the Spatial Hearing Questionnaire (SHQ), Mini-Mental State Examination (MMSE), and Visual Analog Scale (VAS) were compared between the groups. Results: The mean age of the sample was 39.4 years, with 38.4 years for the group without tinnitus and 44.6 years for the tinnitus group. Regarding gender, the group without tinnitus consisted of 83 (67.5%) females and 18 (14.6%) males, while the tinnitus group comprised 19 (15.4%) females and three (2.5%) males. In the comparison between groups, a statistically significant difference was observed in the MMSE and VAS, with the tinnitus group scoring lower on the MMSE and higher on the VAS, indicating more discomfort regarding hearing. Regarding self-perception of spatial hearing, there was no difference in SHQ scores between individuals with and without tinnitus. Conclusion: Individuals with tinnitus complaints exhibit worse results in cognitive screening and greater discomfort regarding hearing compared to individuals without tinnitus complaints. Self-perception of spatial hearing is similar in individuals with and without tinnitus.

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P-33
CHALLENGES AND RESULTS OF COCHLEAR IMPLANT AND TINNITUS: A CASE SERIES

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Introduction: Tinnitus is a common symptom in patients with peripheral hearing loss and it's associated with changes in auditory processing. Cochlear Implant rehabilitation, in many cases, can improve the perception of tinnitus and promote an improvement in quality of life. Objective: To compare the prevalence of tinnitus and to evaluate the impact of cochlear implant rehabilitation in quality of life and audiological outcomes. Methodology: This research consists in a retrospective case series involving patients with sensorineural hearing loss followed by tinnitus. All patients answered to self-assessment questionnaires, such as Tinnitus Handicap Inventory (THI), Speech, Spatial, and Hearing Qualities (SSQ) and World Health Organization Quality of Life - BREF (WHOQOL-BREF). Results: Results showed a substantial reduction in tinnitus-related distress post-implantation, specially in emotional aspect. SSQ scores demonstrated improvements in spatial hearing abilities, while WHOQOL-BREF scores showed an enhancement in quality of life. Auditory outcomes highlighted gains in auditory capacity and enhanced speech perception across several listening environments. Conclusion: Patients with sensorineural hearing loss with preoperative tinnitus will likely benefit from cochlear implantation. The alteration in auditory pathway caused by hearing loss can be solved through the reorganization of the auditory system with auditory therapy based on a new auditory input.

P-34
AUDITORY SKILLS, ACADEMIC PERFORMANCE, AND QUALITY OF LIFE IN PRELINGUALLY DEAF CHILDREN USING COCHLEAR IMPLANTS

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Introduction: The academic performance of children with cochlear implants (CI) depends on efficient auditory skills and processing, impacting not only their academic progress but also their social interaction and quality of life. Objective: To analyze the association between hearing skills and school performance and to assess, from the parents' perspective, the quality of life of prelingually hearing-impaired children using CI. Methods: This cross-sectional study, approved by the institution's Ethics Committee under number 109669, included 17 children aged between six and thirteen years who were unilaterally implanted, along with their respective parents from a public service. Firstly, demographic data and previous medical history were extracted from the children's medical records. The children underwent assessments of auditory skills, reading and writing tests from the School Performance Test (SPT), and parents completed the Quality of Life Questionnaire: "Children with cochlear implants: parents' perspectives". Descriptive analysis included frequency distribution of categorical variables and measures of central tendency and dispersion of continuous variables. Fisher's Exact and Pearson's Chi-squared tests (p ? 0.05) were employed for association analyses, and the Mann-Whitney test (p ? 0.05) was used for further associations. Results: The descriptive analysis of demographic variables revealed that out of the 17 children who participated in the study, the majority (52.9%) were male, with a mean age of 8.59 years. All children (100%) had Risk Indicators for Hearing Loss (RIHL), attended public school (88.2%), and 35.2% were in the 2nd grade. Regarding the education level of the guardians, 64.8% (11) of the mothers and 64.7% (11) of the fathers had completed high school, and for 41.2% (7) of the fathers, their children were progressing in school performance. Assessment of hearing skills revealed a statistically significant association between reading test (p = 0.027) and writing test (p = 0.019) scores and sentence comprehension. According to parental perspectives, CI implementation improved quality of life across all child-related domains, with social relationships scoring highest among the subscales. Conclusion: The study demonstrated that a higher level of auditory skills positively affects academic performance and, consequently, has a positive influence on the quality of life of these children.

FRENCH BRAZILIAN SYMPOSIUM ON HEARING - 2024

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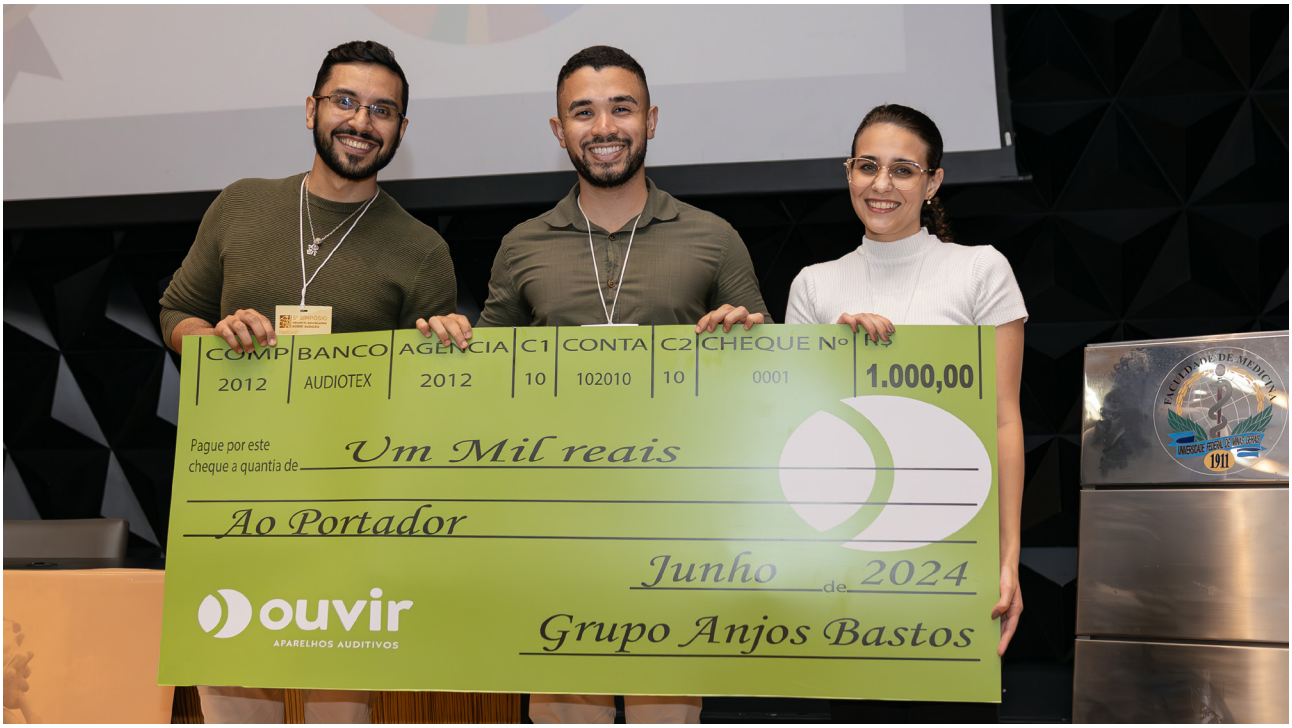

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Thank you!
Obrigado!
Merci beaucoup!