Audiological profile of Auditory Neuropathy Spectrum Disorder in the paediatric population of a selected Audiology Clinic.

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Background: Hearing loss is a major concern worldwide with an estimated prevalence of over 20% globally. Among the different types of hearing loss, this study focuses on Auditory Neuropathy Spectrum Disorder (ANSD). ANSD is characterized by the presence of intact outer hair cells and the absence of typical functioning in the auditory nerve.

Objective/s: To develop an audiological profile of patients with ANSD using audiological records of the paediatric population attending the audiology clinic, Faculty of Medicine, Ragama from 2017-2022, and to compare the risk factors for hearing loss and other associated factors between patients with ANSD and sensorineural hearing loss (SNHL).

Methods: The study design was a retrospective comparative case study conducted in the University Audiology Clinic, Faculty of Medicine, Ragama, Sri Lanka. The population for the study included all patients who attended (2017-2022) the University Audiology Clinic in the age range of 0-18 years. Data was collected from audiological records. The assessment findings were used to develop the profile while the medical history was used to compare the risk factors between ANSD and SNHL patients. Data analysis software (statistical package for social sciences (SPSS) version 26) was used for statistical analysis. Data related to risk factors for hearing loss among patients diagnosed with SNHL and ANSD were analysed, and a comparison was made between the two groups using the Chi-square test.

Results: A total of 1215 pediatric patients have attended the clinic. Out of them ANSD cases were found to be 2.7% of the pediatric population that completed the test, while 16.05% were of the SNHL population. Only one had unilateral ANSD. Distortion Product Oto-Acoustic Emissions (DPOAEs) were present in 44.2% (19) of the ears and inconsistent in 18.6% (8) of the ears. Cochlear Microphonics (CM) was present in all (43) ears. Tb-ABR was absent in 46.2% (12) of the ears while abnormal in 53.8% (14) of the ears. Click ABR was absent in 83.7% (36) of the ears and abnormal in 16.3% (7) of the ears. The degree of hearing loss varied between mild to profound in patients with ANSD. Comparison of the risk factors revealed a statistically significant difference for neonatal hyperbilirubinemia ($p=0.003$), administration of oxygen ($p=0.040$), neonatal sepsis ($p=0.025$), neonatal meningitis ($p=0.014$) and congenital anomalies ($p=0.002$).

Conclusion/s: The proportion of ANSD found in the pediatric population with risk factors is significant and justifies the need to implement newborn hearing screening programs for early identification. Neonatal hyperbilirubinemia, administration of oxygen, sepsis including meningitis, and congenital anomalies can be used as predictors for infants at risk of ANSD. Children with ASD, speech delay, CVI, and GDD require to be screened for ANSD as well.

Key words: *Auditory Brainstem Response, Auditory Neuropathy Spectrum Disorder, risk factors, Cochlear Microphonics, Hyperbilirubinemia, Oto-Acoustic Emission, Sensorineural Hearing Loss*