PREVALENCE OF AUDITORY PROBLEMS IN CHILDREN WITH SPEECH DISORDERS

Papadopoulou D.[1], Bosinaki K.[2], Sidiropoulos Ch.[2], Zournatzis E.[3], Gerostergiou E.[1]

[1] ENT Clinic, General Hospital of Kavala, Greece
[2] Pediatric Clinic, General Hospital of Kavala, Greece
[3] Greek Federation of Mental Health, Kavala, Greece

OVERVIEW

Statement of the problem: delay or failure of normal language development is not a rare situation in childhood. An interdisciplinary approach is recommended for assessment and management of speech disorders and audiologists have an undoubtedly significant role in this team. The objectives of this study are to detect any middle ear disease or any underlying hearing loss among the phenotypically healthy pre-school children with speech delay.
Methodology & Theoretical Orientation: Between January 2016 and October 2018, 58 children aged from 2 to 5 years old, being identified as speech-language delayed were examined in our clinic. The audiological examination consisted of otoscopy and Transient Evoked Otoacoustic Emissions (TEOAEs) at first. The children who did not pass, underwent a series of tests including audiometry, Auditory Brainstem Response (ABR) and tympanometry. If hearing was normal, they were recommended for further examinations in the Greek Federation of Mental Health.
Findings: subjects were classified into 3 groups; those with normal hearing (group I 41 70.69%), fluctuating conductive hearing loss (group II 11 children 18.97%) moderate to profound sensorineural hearing loss (group III 6 children 10.34%) .
Conclusion & Significance: A great number of healthy pre-school children with speech disorders were found to have normal hearing although an important part of them was diagnosed with hearing impairment of varied severity. The above results highlight the necessity of early identification and intervention, as well as the cooperation of specialists to support children in this critical period of language development.

CONTACT

Evdoxia Gerostergiou
ENT Consultant, General Hospital of Kavala
Email: egerostergiou@gmail.com
Phone: 00302513501439

INTRODUCTION

Language is one of the fundamental basis of human intelligence and a key part of human culture. Acquisition of communicational skills begins early in childhood, whilst a significant part of them are developed by the time a child enters kindergarten. They are crucial to the children's mental development as well as socialization.
Speech and Language Disorders (SLDs) are a type of commutation disorder where normal speech is disrupted. Children that have such a condition constitute a large group of patients attending not only the pediatric clinic but also the neurological and ENT clinic.
According to the American Speech-Language-Hearing Association (ASHA) SLDs are divided into Speech Disorders (the way words and sounds are pronounced is affected) and Language Disorders (the way words are used to express thoughts is affected). SLDs often concur with a number of neurodevelopmental disorders including brain malformations, cerebral palsy and autism. Although the exact mechanism and pathophysiology remain unclear, there is a number of known causes.

- *Neurological disorders*
- *Brain injury*
- *Autism*
- *Hearing loss*
- *Developmental delays*
- *Mental retardation*
- *Physical impairments*
- *Vocal abuse*

Causes of SLDs

Speech Disorders

- *Childhood apraxia of speech*
- *Dysarthria*
- *Orofacial myofunctional disorders*
- *Speech sound disorders*
- *Stuttering*
- *Voice disorders*

Language Disorders

- *Preschool language disorders*
- *Learning disabilities*
- *Selective mutism*

ASHA Classification of SLDs

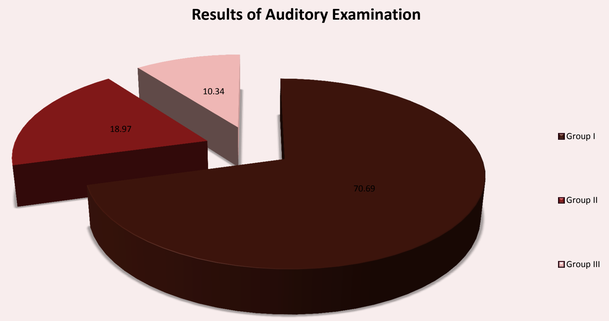
In our region the usual approach of children with speech impairment is interdisciplinary. The Greek Federation of Mental Health is the first health unit parents choose to consult in most of the cases. A primary assessment from speech therapists and physiologists is essential whereas a thorough audiological examination is required afterwards. The current study was therefore designed to detect any hearing impairement among children with speech delay.

METHODS

From January 2016 until October 2018, 58 pre-school children were referred to our clinic from the Greek Federation of Mental Health. Aged from 2 to 5 gears old, those children were identified as speech - language delayed. The audiological examination consisted of otoscopy and Transient Evoked Otoacoustic Emissions (TEOAEs), at first. TEOAEs provide a quick and objective test of the cochlea's outer hair cells. The children who did not pass, underwent a series of tests including Audiometry, Tympanometry and Auditory Brainstem Response (ABR). ABR is a modern non-invasive, objective neurophysiological method for evaluation of hearing threshold in collaboration and also helps in prognostication of neurological disorders. Those examinations were conducted in collaboration with the Pediatric clinic in order for the children to cooperate. If no impairment was found, then they were recommended for further examinations. In case a problem was detected, then the children either received treatment and were retested afterwards, or they were referred to the University ENT Clinic for a hearing aid or cochlear implantation.

RESULTS

A total of 58 children, 34 males (58,62%) and 24 females (41,38%) were examined with otoscopy and TEOAE. 27 who did not pass (46,55%), underwent ABR examination. Out of them, 3 were also tested with audiometry, 7 with tympanometry. Subjects were classified into 3 groups; those with normal hearing (group I 41 70.69%), fluctuating conductive hearing loss (group II 11 children 18.97%) moderate to profound sensorineural hearing loss (group III 6 children 10.34%) . Furthermore, in collaboration with the Greek Federation of Mental Health and by studying all the data we came to the conclusion that 1 child (1,72%) was diagnosed with both profound hearing loss and possible marginal intelligence, 3 children (5,17%) were diagnosed with both autism and fluctuating conductive hearing loss and 1 child (1,72%) was diagnosed with both ADHD (Attention Deficit Hyperactivity Disorder) and fluctuating conductive hearing loss. 11 children (18,97%) with no hearing impairment were identified with either autism, ADHD or mental retardation.



CONCLUSIONS

A significant number of phenotypically healthy, pre school children was identified with some type of SLDs and was therefore referred to our clinic for further examinations. A great part of those children were found with no auditory or neurodevelopmental disorders. Although a significant part of them was diagnosed with hearing impairment of varied severity. Almost 19% of the examined children were found to suffer from fluctuated otitis media, a relatively simple condition, which has an excellent prognosis if treated properly. Hearing loss is restored and children can develop speech normally. Respectively, in children with sensorineural hearing loss a similar approach was made and children were able to overcome any speech disorder. Briefly what needs to be made clear is that early treatment in an audiological condition can restore normal speech development but also prevent a permanent speech disorder. Last but not least, of great importance is the concurrence of neurodevelopmental disorders and auditory problems in children with SLDs as shown from our results. This is the point where we need to pay most attention. In those children the audiologist can act supportively to the main condition and may even deplete the severity of the speech disorder.

The above results highlight the necessity of early identification and intervention, as well as the cooperation of specialists to support children in this critical period of language development. One specialty alone cannot meet the demands of such a complex situation. A physiologist should preferably undertake the coordination, where audiologists, neurologists, pediatricians, child psychiatrists and speech therapists contribute to the best results. Pre-school period is critical in every aspect of a child's life; each one child should be able to receive knowledge, exchange opinions, express feelings, organize and share thoughts, participate in social interactions and relations.

REFERENCES

1. Furlong L 2018 Processes and Challenges in clinical decision-making for children with speech-sound disorders. doi: 10.1111/1460-6984.12426
2. Jonhson CM (2018) Pediatric Dysphonia: A Cross-Sectional Survey of Subspecialty and Primary Care Clinics. doi: 10.1016/j.jvoice.2018.08.017
3. Pereira MB (2015) Association between audiological profile and primary language impairment in children. doi: 10.1016/j.ijporl.2014.11.003.
4. Psillas G (2006) Hearing assessment in pre-school children with speech delay 33(3):259-63
5. Metha B (2015) ABER Assessment in Pre-school Children with Developmental Speech and Language Impairment. doi: 10.7860/JCDR/2015/13723.5873.
6. Keilmann A (2011) Manifestation of speech and language disorders in children with hearing impairment compared with children with specific language disorders