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Case Report

Speech Delay Due to Expressive Language Disorder with Normal Hearing: A Case Report

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Abstract
Background: A method is required in communication to provide information to one another, including the capacity to comprehend and create communications. Language is a mental analysis of communication that includes both receptive language (understanding) and expressive language (ability to convey feelings, information, thoughts and ideas). **Objective:** To be able to find out how appropriate treatment should be for patients with language disorders with normal hearing examination results. **Methods:** PubMed, medline, other manual searches. OAE, BERA, ASSR with normal hearing results according to the case in this patient. Expressive language disorder occurs when a child is unable to articulate or explain the substance of his opinions and ideas verbally according to his age, and OAE, BERA, and ASSR have all been tested with normal findings. **Results:** A child aged 2 years and 8 months was diagnosed with expressive language disorder, considering that his history, physical exams, and OAE, BERA, and ASSR tests were all normal. **Conclusion:** This is necessary to prevent speech and language problems and to allow cognitive, social, and scholastic skills to function properly. To enhance communication and get an improved prognosis, speech treatment and child psychologist advice should be explored.

Keyword: ASSR, BERA, expressive language dissorder, OAE

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1. Introduction

Communication is required when exchanging information, including the capacity to comprehend and produce the message. This communication method evolves based on the general transfer of messages and information concerning needs, wishes, emotions, ideas, perceptions, knowledge, and feelings. This begins the first time infants communicate with their parents by making sounds, looking around, and moving their bodies [1, 2]. Language is a mental analysis of communication that is divided into two parts: receptive language (understanding) and expressive language (the ability to convey information, feelings, thoughts and ideas). A speaking process is required in interacting with this language, where there is verbal output of language by articulating it in verbal articulation. Speech and language processes in children grow in parallel with the hearing process, so hearing tests such as OAE, BERA, and ASSR are required to evaluate the hearing threshold in children, as well as early discovery as part of a rehabilitation effort as soon as possible if there is hearing loss [1-3].

Someone is said to have speech and language delays if their language and speech development is considerably behind the milestones of children their age with a range of less than 36 months and a gap of 6 months between present speech and language development and the milestones of children their age [2, 3]. In

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the United States, the frequency of children aged 2-7 years suffering speech delay varies from 2.3-19%, with males being 1.5 times more likely than girls. The majority (69.60%) of patient concerns about speech delays were discovered between the ages of 13 and 36 months, and they were more prevalent in boys (71.20%). According to a cohort research in England, 18,000 children have a double chance of speech and language delays due to poor socioeconomic factors, indicating that social, economic, and family education factors are also important factors in growing speech and language delays in children [1, 5-7].

The linguistic center is divided into four sections and is situated in the left hemisphere. Two receptive areas (language sensory) and two executive areas (motor language) are combined to create language. Broca's and Wernicke's areas are the primary areas of the cortex for language. Broca's area is located in the left frontal lobe, next to the motor cortex, which controls the articulation muscles, or the muscles that control speech.

Wernicke's language comprehension area is located in the left cortex, between the parietal, temporal, and occipital lobes. This area is critical for understanding spoken and written language. Furthermore, Wernicke's area is essential in the development of coherent speech patterns via fiber bundles to Broca's area, which regulates speech articulation. Wernicke's area gets information from the occipital lobe's visual cortex, which is the pathway for understanding written and describing things seen, and the temporal lobe's aural cortex, which is the pathway for understanding spoken language. It is these precise pathways between cortical areas that play a role in various aspects of speech [8, 9].

There are several aspects to language development, including phonology (consonants, vowels, and syllables have no meaning), morphology (the smallest units of meaning in words), syntax (putting words together into sentences), semantics (using words), pragmatics (speaking and communicating in social situations), and sequencing (the ability to arrange sentences into a chronological story). Furthermore, it is necessary to pay attention to the normal developmental milestones for expressive language development, namely, babies are already making cooing sounds (snoring sounds) at the age of 0-3 months, and at the age of 3-6 months, they are able to make babbling and babbling sounds such as aaa, ooo. Age 6-9 months is issued a more diverse babbling, age 9-12 months is issued the ability to mimic sound (echolalia) and begin conversing with motions, 12-18 months is issued 1-10 meaningful words, and 18-24 months is issued 1-50 meaningful words [10-13].

Meanwhile, one-year-olds comprehend one command and one meaningful word; two-year-olds understand two instructions and can combine two words; and three-year-olds understand three orders, carry them out, and can combine three words into sentences. A child of 4-5 years old can say over 900 words and respond to two command sentences. The need to be aware of hearing impairments such as not being able to babble or imitate before the age of 12 months (1 year), inability to say one meaningful word before the age of 18 months, vocabulary less than 10 words before the age of 18 months and unable to form two words before the age of 30 months [2, 10].

The newborn hearing screening program for early detection of the universal newborn hearing screening), which was carried out on all newborns, the effort was made at the age of 2 days or before leaving the hospital, and targeted newborn hearing screening, which was carried out in infants with various risk factors in accordance with the American Joint Committee on Infant Hearing (2000), which is divided into [11]:

a. Age 0-28 days:
   - The state of an infant who needs intensive care in the NICU for at least 48 hours or more.
   - Medical disorders that are linked to sensorineural or conductive hearing loss and are connected with certain syndromes.
   - There is a family history of hearing loss that has been present since infancy.
   - Craniofacial disorders include morphological disorders of leaves or ear canrs.
   - Torchs infection.
b. From 29 days to 2 years:
   - Parents/caregivers suspect that their children have hearing loss, speech delays, aphasia, or developmental delays.
   - The presence of a family background of permanent hearing loss since infancy.
   - A illness linked with certain symptoms known to be related to sensorineural, conductive, or Eustachus tube dysfunction disorders.
   - Infections that occur after delivery and induce sensorineural hearing loss, such as bacterial meningitis.
   - Torchs infection.
   - The existence of certain risk factors during the neonatal period, especially hyperbilirubinemia which requires transfusion, pulmonary hypertension that requires ventilator and other diseases.
   - Some syndrome associated with progressive hearing loss such as usher syndrome, neurofibromatosis,

osteopetrosis.
- Disease in the nervous system.
- Head trauma.
- Otitis media (OM) recurred or persistent accompanied by middle ear effusion for a minimum of 3 months.

Otoacoustic emission (OAE) is an electrophysiological examination to assess cochlear hair cell function, where this examination is non-invasive, easy to practice, does not take long, and is efficient with the results of pass/refer criteria. The OAE algorithm is [12, 13]:

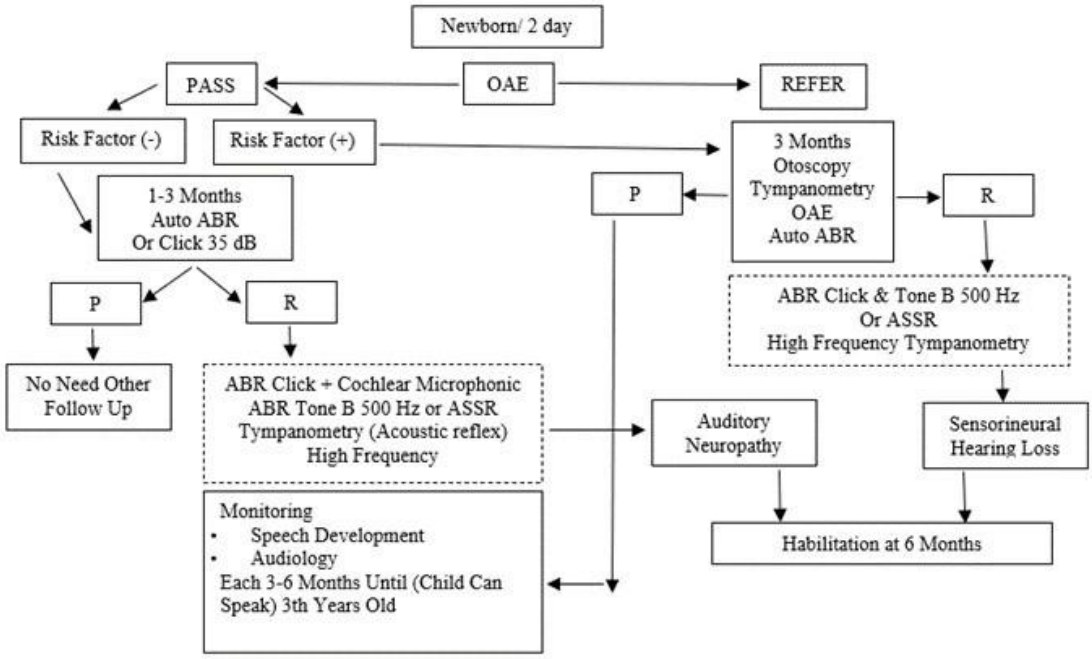


Figure 1. Flow of Hearing Screening in Indonesia

Brainstem Evoked Response Audiometry (BERA) is a method of capturing sound reactions electrophysiologically. This evaluation can be formally documented from the activation of all layers of the auditory system, from the cochlea to the cortex, using the accurate and exact test technique. BERA is caused by auditory stimuli (clicks and tone bursts) and is identified by electrodes put on the brow and near the ear (auricle or in the ear canal). The most essential BERA examination in evaluating the auditory system is to evaluate a person's hearing capacity as objectively as feasible [14, 15].

The effectiveness of BERA can be evaluated using two methods. The first is to watch the response amplitude, which is created by a decline in the intensity of the stimulation until the brainstem response disappears. The wave V component is used in BERA to determine the hearing threshold, but there is a discrepancy between the documented electrophysiological hearing threshold and the behavioral hearing threshold when the findings are presented (actual hearing threshold). Hearing thresholds vary due to pathological circumstances and technological factors used when testing BERA. When compared to actual hearing threshold estimates, electrophysiological hearing thresholds recorded in ABER were 10 decibels lower in adults and approximately 20 decibels higher in the infant population [14, 15].

The second approach involves measuring input-output function for the purpose to evaluate aural function. This is referred to as the correlation between stimulus strength and brainstem reaction delay in the BERA test. The connection between the latency time of wave V at different intensities is included in this, which is known as the intensity latency function. Decibels or milliseconds are used to quantify the outcomes of the slope's measurement function [14, 15].

A regular stimulation results in the generation of an Auditory Steady State Response (ASSR), which is a repetitive brain potential. Additionally, ASSR can be used to calculate hearing limits based on physiological reactions rather than subjective impressions of the person. An empirical statistical measure was used to determine the reaction that resulted. When performing simple hearing function exams on unwilling children or adults, ASSR can determine their hearing threshold. This test measures hearing thresholds for particular

frequencies and is frequency-specific [14, 15].

2. Case Presentation

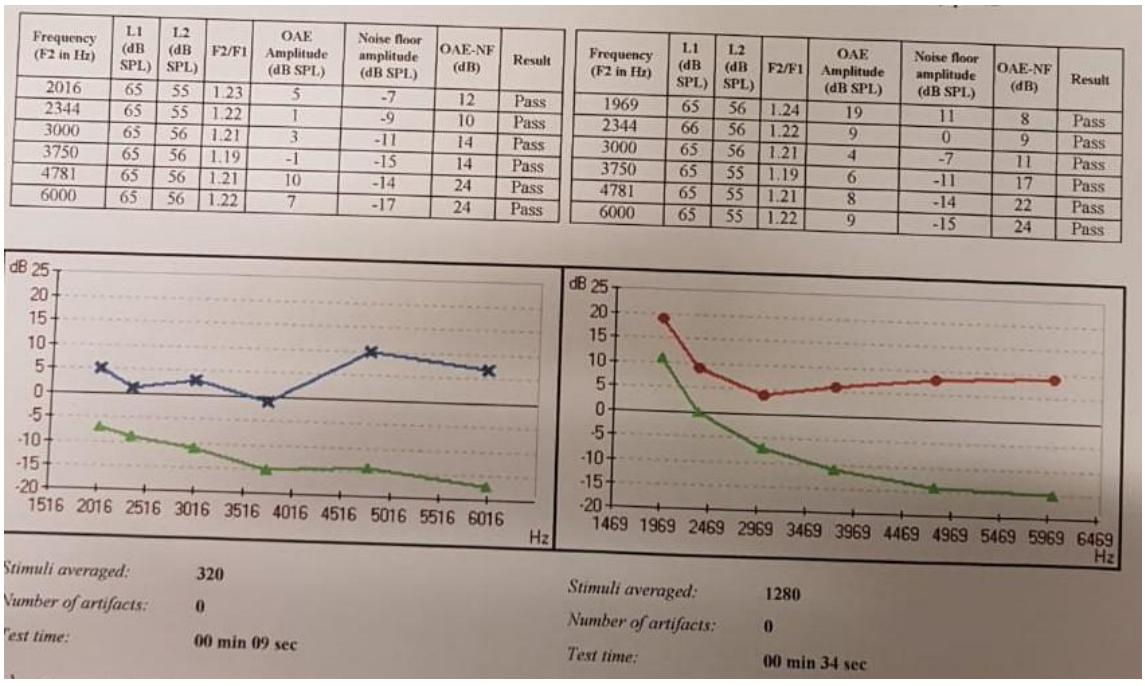
On January 11, 2023, a scan of the literature using the terms "speech and language disorders," "OAE," "BERA," and "ASSR" was done. Medline, PubMed, and other hand searches were used for the results. We conducted a literature search using the following selection criteria: 1) Communication and linguistic issues 2) children older than 2 years 3) A common hearing test. This summary does not include additional audited publications.

A case report which was a male patient aged 2 years 8 months (32 months) came to the ENT-KL Polyclinic at RSUDZA Banda Aceh with complaints of not being able to speak and not responding to sound. From alloanamnesis with the patient's biological parents, the patient could not yet speak and had little response when called and only saw occasionally. The patient is surprised if there is a loud sound such as a horn or thunder. Currently the patient only says things like baa, aaa, which have no real meaning. The patient is the first child of two siblings. Currently the patient is able to sit up straight without the help of others, walk, run, jump. The patient is also able to play alone but is less willing to join in when playing with his friends.

The patient when spoken to does not make eye contact and is also hyperactive. Patients often see gadgets from the age of 8-9 months. Past Medical History: No cataracts, no heart defects, no cleft lip/cleft palate, no history of trauma/falls, no family history of suffering from the same thing either hearing loss or speech impairment. History of breastfeeding up to the age of 1 year, history of immunization never. History of social habits: Watching gadgets is found for more than 2 hours starting at the age of 8-9 months until now. Prenatal history within normal limits, Perinatal/Neonatal history within normal limits, Postnatal history within normal limits.

Cooing noises are also made between the ages of 0 and 3 months, during the linguistic development stages. Age 3 to 6 months: Begin talking (chattering) to get the focus they haven't yet received. Age 6 to 9 months: Lack of communication and sporadic muttering (chattering) to get focus. Age 12 months: Lacks habitual speech; responds to straightforward inquiries by gazing and occasionally turning without baaing or maaing. Age 15–18 months: Reacts to basic inquiries by occasionally turning and babbling, "baa, maa," indicating poor language comprehension. 24 month old: No words at this time. Age 24-31 months: understands directions, for instance, takes the table but only rarely glances up, less than 50% of words are understood, and more only points when you want to ask for something.

Physical examination within normal limits, localized status, at auris region, nasal, oropharynx, coli, maxillofacial within normal limits. Then an inspection of Distortion Product Otoacoustic Emissions (DPOAE) (28/04/2021) was carried out as follows:

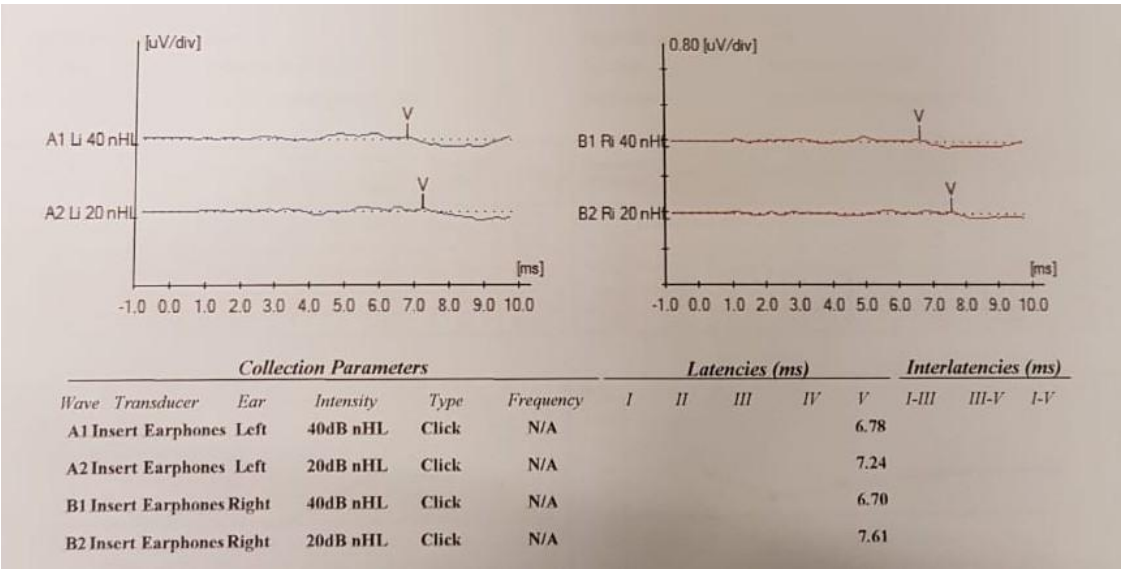


Frequency (F2 in Hz)	L1 (dB SPL)	L2 (dB SPL)	F2/F1	OAE Amplitude (dB SPL)	Noise floor amplitude (dB SPL)	OAE-NF (dB)	Result
2016	65	55	1.23	5	-7	12	Pass
2344	65	55	1.22	1	-9	10	Pass
3000	65	56	1.21	3	-11	14	Pass
3750	65	56	1.19	-1	-15	14	Pass
4781	65	56	1.21	10	-14	24	Pass
6000	65	56	1.22	7	-17	24	Pass

Frequency (F2 in Hz)	L1 (dB SPL)	L2 (dB SPL)	F2/F1	OAE Amplitude (dB SPL)	Noise floor amplitude (dB SPL)	OAE-NF (dB)	Result
1969	65	56	1.24	19	11	8	Pass
2344	66	56	1.22	9	0	9	Pass
3000	65	56	1.21	4	-7	11	Pass
3750	65	55	1.19	6	-11	17	Pass
4781	65	55	1.21	8	-14	22	Pass
6000	65	55	1.22	9	-15	24	Pass

Figure 2. DPOAE Examination

The DPOAE examination obtained pass/pass results, there was no disturbance of the cochlear outer hair cells in both ears. Then proceed with the Brain Evoked Response Auditory (BERA) examination (28/04/2021) as follows:



Collection Parameters					Latencies (ms)					Interlatencies (ms)		
Wave Transducer	Ear	Intensity	Type	Frequency	I	II	III	IV	V	I-III	III-V	I-V
A1 Insert Earphones	Left	40dB nHL	Click	N/A					6.78			
A2 Insert Earphones	Left	20dB nHL	Click	N/A					7.24			
B1 Insert Earphones	Right	40dB nHL	Click	N/A					6.70			
B2 Insert Earphones	Right	20dB nHL	Click	N/A					7.61			

Figure 3. BERA Examination

The BERA examination showed that there was a V-wave response at an intensity of 20 dB and 40 dB in the right and left ears. Then proceed with the Auditory Steady State Response (ASSR) examination (28/04/2021) as follows:

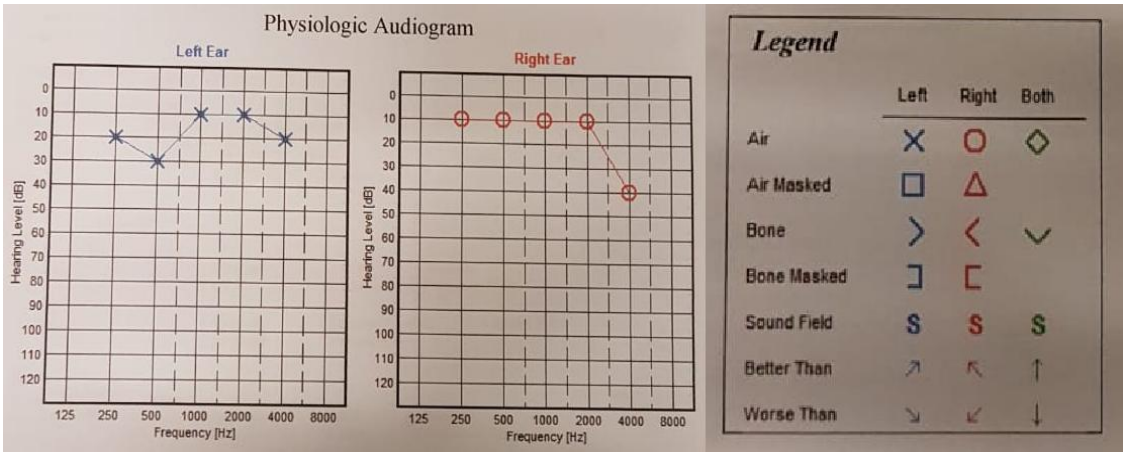


Figure 4. ASSR Examination

On the ASSR examination, the results of Auris Dextra and Auris Sinistra were 17.5 dB with the conclusion that the hearing threshold values were within normal limits in both ears.

3. Discussion

A boy, 2 years, 8 months old, who complained of not being able to talk and not responding to sound, was reported. Due to alloanamnesis with the patient's real parents, the patient was unable to talk and responded slowly when called in, but she would startle at loud noises like a door slamming, a horn, or thunder. Currently, the sufferer only utters meaningless words like baa and aaa. Patients have occasionally turned their heads in response to simple inquiries, but less than 50% of them claimed to not comprehend what was being said, and more only pointed when they needed something. The patient is able to play by himself but does not participate when interacting with friends. Based on the anamnesis above, it is suspected that the patient has expressive language disorders.

A child is diagnosed with a delay in speaking if the child's speech development lags behind the development of normal children of his age. Language disorders are divided into two categories, namely, receptive language disorder where it is difficult to receive or understand messages conveyed by other people, so that sometimes it is difficult for the child to act (response) and expressive language disorder where it is difficult to express himself when responding to someone talking to him or the child. The person understands the instructions given but cannot speak or express them. The inability of a child to speak at any time can be obtained during childhood without any clear cause, either due to environmental factors, emotions, hearing problems, and in most cases this disorder is congenital or congenital [5, 16].

Boys represent the majority of the patients, and in the USA, the prevalence of speech and developmental delays between the ages of 2 and 7 varies from 2.3 to 19%. The prevalence in Indonesia is thought to be 15% at 24-29 months with a lexicon of fewer than 50 words, with or without word combinations, and is 1.5–4 times higher in men than in females. Males are considered to have delayed physiological growth and are more likely to experience neurological diseases than females, and it's conceivable that they exhibit more abnormalities in the areas of cognition, language, and social interaction than do females [1, 5-7].

The patient was unable to talk properly and appeared less responsive when contacted or given voice directions, according to the anamnesis. Only rarely glance when you are called. Loud noises like sirens, thunder, or closing doors frighten the patient. only a sufferer right now. Where there is no significant significance, say aa, baa. According to theory, in terms of aspects of the child's language, they are still in the phonological stage, namely having vowel consonants, syllables, but they do not have meaning, where the child should be in the syntax stage, namely assembling words into sentences, where at the age of 24-35 months, 150-300 words are spoken words, volume and pitch of voice have not been controlled, and can already distinguish colors, understand the concept of big and small, now and then.

In the milestones of normal development, it is said that the language is receptive (understanding) aged 2-3 years, namely understanding the concept of place words such as "inside, above", understanding pronouns, and also understanding words that refer to people, family, father, mother, sister, grandmother , and understand the two instructions. In expressive language (pronunciation), pronounce a minimum of 40 vocabulary words, compose 2-3 words, speech begins to clear but often loses the end of words, can answer simply, uses pronouns "you", "he", asks questions with intonation, but not a question sentence structure and able to tell simple pictures. However, these patients experienced more expressive language disorders.

The patient has a history of watching gadgets and is found for more than 2 hours starting at the age of 8-9 months until the present age. One of the risk factors for this gadget to occur is due to the lack of stimulation between parents and children which according to theory will have a lot of impact on various aspects, especially speech and language disorders where speech delays occur, isolate or the child is not interested in interacting with the environment, the child is unable to express wishes with appropriate expressiveness, including cognitive, social, emotional loss. According to Jean Piagett's theory that language relates to behavior and cognition where there are 4 stages that children will later go through, namely sensorimotor (0-2 years, namely understanding something by coordinating sensory with physical motor), preoperative (2-7 years, namely doing with behavior and words but do not understand their meaning), concrete operations (7-11 years, namely thinking logically with concrete events) and formal (age 11 years and over, namely thinking more abstractly, logically and idealistically). If there is interference, the child will have problems with the development of language and speech, so that behavior and cognition will also be disrupted [17, 18].

Patients who complain of not responding to sound are suspected to have hearing loss, and since children under the age of 32 months should not be able to put together more than two syllables, a hearing test using the Otoacoustic Emission (OAE), BERA, or ASSR is necessary. The benefits of using OAE as a hearing screening include the ability to evaluate each ear independently, the ability to capture examination responses without needing the baby's active involvement, and the ability to evaluate a broad enough frequency range. An objective, automatic (pass or send), condensed, practical, and efficient electrophysiological test called an OAE is used to evaluate infant hearing exams. The principle is that when the cochlea is stimulated by the ear, then the emissions released by the ear are measured, where this technique is sensitive in detecting damage to the outer hair cells, and can also monitor the condition of the middle and inner ear [13, 14, 20].

The DPOAE findings revealed a pass/pass, meaning that neither the right nor left ear's cochlear outer hair cells were disturbed. The infant can pass the OAE (pass) test if there is an OAE wave (6 dB above the noise level), which indicates he does not have hearing loss. The pass findings rule out severe hearing loss even though they don't always represent normal hearing sensitivity. If there are no OAE waveforms, hearing loss is present. (reference) [20].

To ensure that there is no hearing loss, further examination is needed, namely BERA and ASSR. Brain Evoked Auditory Response (BERA) examination with the results of a wave V response at an intensity of 20

dB and 40 dB in the right and left ears. This examination is an objective and non-invasive physiological examination in assessing the response of the auditory system to sound, so that it can determine the threshold of hearing and the location of the lesion in the auditory system.

Responses to auditory stimuli were recorded via surface electrodes attached to the head. The recorded stimulus is then processed by a computer program and interpreted as five areas of positive deflection waves (wave I to wave V) that occur 2-12 ms after the stimulus is given [13, 21]. In BERA the wave V component is used to estimate hearing thresholds but in readings The results show that there is a difference between the recorded electrophysiological hearing threshold and the behavioral hearing threshold (actual hearing threshold). The difference in hearing thresholds is related to pathological conditions and technical parameters used when measuring BERA. Electrophysiological hearing thresholds recorded in ABER were 10 db worse in adults and approximately 20 db better in the infant population when compared with actual hearing threshold estimates [13, 15].

On the ASSR (Auditory State Response Report) examination, the results of the hearing thresholds in both ears were within normal limits. This ASSR is an electrophysiological examination of the response of the auditory system in the brain which is generated by a sound stimulus which can produce a hearing threshold at a specific frequency, and the time needed to reach the hearing threshold is faster because it can test with four frequencies in both ears simultaneously (0, 5,1,2,4 kHz).

After taking the entire history, physical examination and support, the diagnosis was found in this patient with Speech Delay ec. Expressive Language Disorder dd Autism and ADHD. All hearing tests carried out were found to be within normal limits or there was no hearing loss so that the diagnosis referred to the DSM-5 diagnosis of autism and ADHD.

Based on the overall examination of the patient, it is recommended that speech therapy be used to treat speech problems with the goal being to improve the child's ability to speak and express language. In addition to verbal language, this therapy also trains nonverbal forms of language. The goal of developing this therapy is to maximize oral coordination so that it can produce sounds to form words. This oral exercise is an important step so that the patient can produce sufficient volume of voice with smooth and clear sentences and articulations. Besides that, it can also improve understanding and express in language.

Expressive language skills consist of 3 main areas, including: vocabulary (content/meaning), mechanics (morphology/phonology), and grammar (how we put words together). The goals of treatment vary widely, depending on the perceived difficulties the child is experiencing. While the focus has often been on expressive aspects of language, much research has also focused on receptive language skills or verbal comprehension, and in the last decade there has been increased emphasis on pragmatic language difficulties (the way children use language with other people).

4. Conclusion

It has been reported a boy patient, aged 2 years 8 months with complaints of not being able to speak and lack of response to sound. After anamnesis, physical examination and hearing examination OAE, BERA and ASSR in the patient were obtained with normal results. The patient has a language disorder.

5. Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available due to privacy and ethical considerations but are available from the corresponding author upon reasonable request.

6. Ethical Statement

Sumatera Medical Journal (SUMEJ) is a peer-reviewed international electronic journal. The following statement clarifies the ethical behavior expected from all parties involved in the publication process of articles in Sumatera Medical Journal (SUMEJ), including authors, the Editor-in-Chief, the Editorial Board, peer reviewers, and the publisher, TALENTA Publisher Universitas Sumatera Utara. This statement is based on the Best Practice Guidelines for Journal Editors developed by Committee on Publication Ethics (COPE).

7. Author Contributions

All authors contributed to the design and implementation of the research, data analysis, and finalizing the manuscript.

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10. Conflict of Interest
Authors declares no conflict of interest.

References
[1] McLaughlin MR. Speech and language delay in children. Am Fam Physician. 2011;83:1183–8.
[2] Kolegium THT-KL Indonesia. Modul perkembangan bahasa dan bicara. 2015;9:51–70 [cited 2023 Jan 16]. Available from: https://elearning.kolegiumthtkl.com.
[3] Sunderajan T, Kanhere SV. Speech and language delay in children: prevalence and risk factors. J Fam Med Prim Care. 2019;8:1642–6.
[4] Feldman HM. Evaluation and management of language and speech disorders in preschool children. Pediatr Rev. 2014;26:131–41.
[5] Dewanti A, Widjaja JA, Tjandrajani A, Burhany AA. Karakteristik keterlambatan bicara di Klinik Khusus Tumbuh Kembang RSAB Harapan Kita tahun 2008–2009. Sari Pediatri. 2012;14:230–4.
[6] Law J, Mensah F, Westrupp E, Reilly S. Social disadvantage and early language delay. Cent Res Excell Child Lang Policy Br. 2015:1–3.
[7] Shriberg L, Tomblin J, McSweeny J. Prevalence of speech delay in 6-year-old children and comorbidity with language impairment. J Speech Lang Hear Res. 2014;42:1461–81.
[8] Sherwood L. Fisiologi manusia: dari sel ke sistem. Octavius H, editor. 8th ed. 2015.
[9] Estiasari R. Pemeriksaan klinis neurologi praktis. Kol Neurol Indones. 2018;62–9.
[10] Auife A. Milestone perkembangan bahasa. Association of Indonesia Dyslexia. 2021 [cited 2023 Jan 1]. Available from: https://asosiasidisleksiaindonesia.com.
[11] Joint Committee on Infant Hearing. Position statement: principles and guidelines for early hearing detection and intervention programs. Pediatrics. 2007;120:898–921.
[12] Suwento R, Semiramis Z, Airlangga T. Skrining pendengaran pada bayi baru lahir. Kementerian Kesehatan RI. 2010.
[13] Wroblewska-Seniuk KE, Dabrowski P, Szyfter W, Mazela J. Universal newborn hearing screening: methods and results, obstacles, and benefit. Int Pediatr Res Found Inc. 2017;81:415–22.
[14] Casali RL, Santos MF. Auditory brainstem evoked response: response pattern of full-term and premature infants. Braz J Otorhinolaryngol. 2010;76(6):729–38.
[15] Hood LJ. Auditory brainstem response: estimation of hearing sensitivity. In: Katz J, Chasin M, Hood LJ, Tillery KL, editors. Handbook of clinical audiology. 7th ed. Philadelphia: Lippincott Williams & Wilkins; 2015. p. 249–65.
[16] Fitriyani F, Sumantri MS, Supena A. Language development and social emotions in children with speech delay: case study of 9 year olds in elementary school. J Konseling dan Pendidikan. 2019;7:23–9.
[17] Zizlavsky S. Candida T. Agenesis corpus callosum: dampaknya pada perkembangan bicara anak. Oto Rhino Laryngol Indones. 2019;49:1–9 [cited 2023 Jan 13]. Available from: https://orli.or.id/index.php/orli/article/view/321.
[18] Kholiq A. How is Piaget's theory used to test the cognitive readiness of early childhood in school. Indones J Early Child Educ Stud. 2020;9:24–8.
[19] Bess F, Humes L. Audiology: the fundamentals. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2008.
[20] Hall J, Johnston K. Diagnostic audiology, hearing instruments and habilitation options. In: Ballenger's otorhinolaryngology head and neck surgery. 6th ed. 2009. p. 115–30.