

# A Follow-Up Study of Children Diagnosed with Delayed Speech and Language

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## ABSTRACT

**Objective:** The aim of our study was to examine the current health status of children with normal peripheral hearing who were referred to the audiology clinic with complaints of speech and language delay in early childhood.

**Methods:** The data of a retrospective file review in which the information of 105 children with normal hearing ages 12-60 months referred to the Audiology Clinic with complaints of speech and language delay were used in the study. After the initial diagnosis of delayed speech and language (approximately two years), their medical condition was assessed through semi-structured telephone interviews. The obtained data are presented with descriptive statistics.

**Results:** Out of 105 children, 54 (51.4%) were diagnosed with other additional diagnoses including; autism spectrum disorder:21 (20%), general developmental delay: 13 (12.3%), attention deficit and hyperactivity disorder: 9 (8.5%), epilepsy: 4 (3.8%).7 (6.6%) of children followed from endocrine, neurology, genetics, cardiology, nephrology and ophthalmology departments. 51 children (48.57%) have achieved the average level of speech and language development with interventions such as speech and language therapy and/or social support in the following period, and they do not currently have any medical follow-up.

**Conclusion:** The results indicated that cases where children who apply with the complaint of speech and language delay may have additional diagnoses in the future, or they can achieve the average level of speech and language development with specialist interventions. Long-term follow-up of this delay is important in terms of providing effective communication skills and the probability of being a diagnostic marker.

**Keywords:** delayed speech; delayed language; diagnostic marker.

## 1. INTRODUCTION

Language is the conceptual processing of communication that includes receptive language (understanding) and expressive language (the ability to communicate information, feelings, thoughts, and ideas). A verbal production of language is speech (1). The fact that the child does not develop speech and language at the expected rate compared to typically developing peers is called speech and language delay (1). While atypical speech and language development can first appear as speech and language problems, it can also be a secondary feature of physical and developmental problems (2). Primary types of speech and language delay include developmental speech and language delay, expressive language disorder, and receptive language disorder. Secondary speech and language delays can be attributed to other conditions, such as intellectual disability, autism spectrum disorder, selective mutism, physical speech problems, or hearing loss (2).

Speech and language disorders in children are associated with increased difficulty in reading, writing, attention, and

socialization (3). Studies evaluating these associations, evidence from both cross-sectional and prospective longitudinal studies of children with speech-language disorders indicate an increased risk of psychiatric disorders in children with speech and language disorders (4). Although the relationship between speech and language disorders and psychiatric problems cannot be clearly explained, it has been reported that more than 50 % of children referred to psychiatric counseling have disorders in speech and language development. This suggests that speech and language delay may be a diagnostic marker of some psychiatric disorders (5). Being a diagnostic marker essential for cases where early diagnosis and treatment may have better results (autism, general developmental delay, etc.), and medical follow-up should be done. Scientific reports indicate that untreated speech and language delay can persist in 40%–60% of children, and these children are at a higher risk of psychosocial, behavioral, and cognitive problems in adulthood (6).

Parents of children with delayed speech should be informed about this diagnostic marker status and possible scenarios. Although the child and family are the main denominators in the solution of delayed speech and language problems, they should be told to the family that the situation should be managed by a large team such as pediatrics, child psychiatry, neurology, otolaryngology, audiology, speech and language specialists, according to the needs of the patient (7). Speech and language delay, which has different reasons and different outputs, should be followed up on how will take shape after the first detection. The status of the child population with speech and language delay at first application to the clinic and then detailed follow-up, recovery, or additional diagnosis is very important in terms of providing information about the approach to this population.

The study aimed to examine the current medical conditions of children with normal peripheral hearing who were referred to the Audiology Clinic with complaints of speech and language delay in early childhood. We also emphasize the probability of delayed speech being a diagnostic marker, the importance of the long-term follow-up and raise awareness by stating how the diagnosis of speech and language delay can lead to various consequences.

## 2. METHODS

This study was approved by the Ethics Committee of the Medical Faculty of Marmara University (Protocol no:09.2022.1542). Moreover, it has been carried out by the Declaration of Helsinki. Informed consent was obtained from all participants and their parents.

The study was based on parental reports of patients who were referred to the Audiology Clinic by the Department of Child Psychiatry between 2015 and 2019 with complaints of delayed speech and language. It is a cross-sectional follow-up study. Children who had delayed speech and language complaints and normal bilateral peripheral hearing were randomly selected from the medical record system. In the evaluation of peripheral hearing as within normal limits, it is necessary to have bilateral type A tympanograms and bilateral acoustic reflexes (0.5, 1,2,4 kHz), and to have passed bilateral transient evoked and distortion product otoacoustic emissions tests. In addition, conditional play/behavioral audiometry and/or clinical ABR were performed according to the child's age and cooperation status, and it was also required to include the statement that "peripheral hearing is within normal limits" in the medical record system. The study continued with the families of 105 children who gave consent to the research out of 138 phone calls. Taking into account the conditions such as a diagnosis by performing the necessary tests and initiation of treatment/therapy, their medical conditions after at least two years of initial diagnosis were questioned retrospectively.

A semi-structured telephone interview was conducted with the mother and/or father to investigate the aftermath. Information about the current communication and health

status of the cases was obtained, and the educational support and treatments they received during the follow-up were questioned. Interviews were conducted in a semi-structured manner based on predetermined questions. Interviews lasted between 10 and 15 minutes, and all parents could cooperate with the interview, understood the questions asked, and gave appropriate answers. Telephone interviews which information was obtained, were made with mothers who are primarily responsible for the self-care of children. All interviews were conducted by the same person; thus, it was aimed to prevent differences between evaluations. The interview questions are shown in Table 1.

**Table 1.** Interview questions

Is her/his speech at the same level as her/his peers, is there any delay in speech and language?
Does he/she make sentences? /Does he/she follow verbal instructions?
Is his/her speech and language understandable by others?
Were there any medical problems pre – and post-natally?
Is there a consanguinity between his/her mother and father?
What is the educational status of the parents?
Is the child growing up in a bilingual or multilingual environment?
When was the delayed speech and language complaint noticed first?
Are there any other individuals in the family who have/had a speech and language delay/disorder?
Did Child Psychiatry make any other additional diagnosis? If yes; what is it? Is he/she taking any medication?
Is there any follow-up from any other medical departments? If yes; what is his/her medical diagnosis?
Does he/ she take speech and language therapy? If yes; when did speech and language therapy begin, how long did it last, is it ongoing?
Does he/she take special education? If yes; when did special education begin, how long did it last, is it ongoing?
Does he/she take physiotherapy? If yes; when did physiotherapy begin, how long did it last, is it ongoing?
Does he/she take ergotherapy? If yes; when did ergotherapy begin, how long did it last, is it ongoing?
Does he/she take any other training/therapy/rehabilitation? If yes; when did it begin, how long did it last, is it ongoing?

## 3. RESULTS

The ages of the cases, which consisted of 84 males and 21 females, were between a minimum of 12 months and a maximum of 60 months (Mean  $\pm$  SD= 28  $\pm$  2.7 months, SD: standard deviation).

According to the non-medical feedback based on parents' personal opinions; 52 (49.52 %) of children had speech and language delays compared to their peers. 74 (70.47 %) of children can form sentences with the number of words appropriate for their age (2 years-2 words, 3 years-3 words, etc.). Children who could not follow verbal instructions were 36 (34.28 %). The number of children whose speech is understandable by others was 65 (61.90 %). The number of children with consanguinity between their mother and father was 32 (30.47 %). The number of mothers and fathers

for educational status, respectively; primary school: 14, 9; secondary school: 23, 21; high school: 46, 48; undergraduate/graduate degree: 22, 29. The number of children growing up in a bilingual or multilingual environment was 43 (40.95 %) (female:19; male:24). some medical risk factors affect speech and language development (8).

A total of 105 children included in our study, 99 children had some of these risk factors. These risk factors and our participant distribution are shown in Figure 1. The first

suspicious of parents about speech and language delay are around 13±1.8 months.

According to the data of the medical diagnosis; 51 (49 %) of children had a diagnosis of only delayed speech and language. These children reached an average level of speech and language. They are not currently followed up by any medical department. 54 (51 %) of children had other diagnoses in addition to delayed speech and language. The follow-ups of the children after diagnosis of delayed speech and language are shown in Table 2.

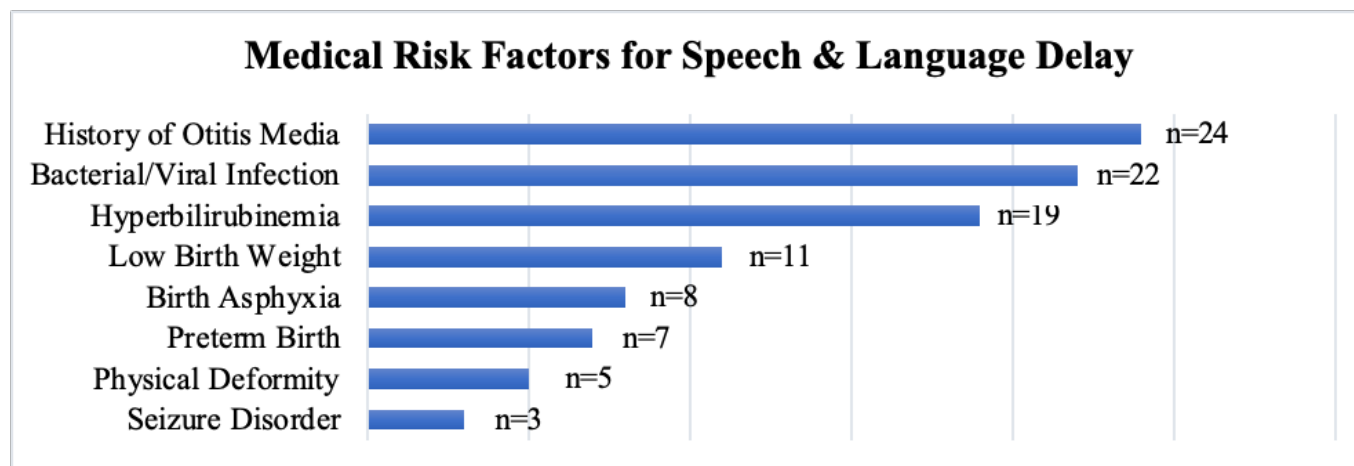


Figure 1. The number of children with medical risk factors associated with speech and language delay

Table 2. Medical conditions in the middle childhood of children diagnosed with speech and language delay in early childhood

Delayed speech and language + Other diagnoses	(n=54) (%)
Autism spectrum disorder	21 (20%)
General developmental delay	13 (12.3%)
Attention deficit and hyperactivity disorder	9 (8.5%)
Epilepsy	4 (3.8%)
Followed by other medical departments*	7 (6.6%)
Only delayed speech and language	(n=51) (%)
Recommendations and social environment support	22 (20.9%)
Recommendations, social environment support and Speech and language therapy	29 (27.6%)

\*Departments such as metabolism, endocrine, neurology, genetics, cardiology, nephrology and ophthalmology.

Moreover, there was a history of delayed speech and language in the family of 14 participants. 3 of them have autism spectrum disorder, 2 of them have attention deficit and hyperactivity disorder, 7 of them have achieved average speech and language levels, 2 of them with follow-up from other medical departments, and one has epilepsy.

The medical condition of the children at least two years after the delayed speech and language diagnosis and the types of therapy they received are shown in Table 3. In addition, children who received speech and language therapy and whose speech and language development have achieved average levels are only under follow-up for other medical diagnoses.

**Table 3.** Types of therapy for children with delayed speech and language and other diagnoses

Delayed speech and language + Other diagnoses (n=54)	SLT	SE+SLT	PT+SLT	SE+PT+SLT	Achieved average speech and language level
Autism spectrum disorder (n=21)	3	10	1	3	4 T.D: 12.1±2.3 months
General developmental delay (n=13)	3	4	3		3 T.D: 8.3±3.2 months
Attention deficit and hyperactivity disorder (n=9)	2	5			2 T.D: 9.2±2.1 months
Epilepsy (n=4)		1	1		2 T.D: 6.3±2.1 months
Followed by other departments (n=7)		1	1		5 T.D: 8.3±3.1 months
<b>Only delayed speech and language diagnosis (n=51)</b>					
Recommendations and social environment support (n=21)					Without speech and language therapy
Recommendations, environment support, and speech & language therapy (n=29)					29 T.D: 11.1±4.5 months

S.E.: special education, S.L.T.: speech and language therapy, PT: physiotherapy, T.D.: therapy duration: Mean ± standard deviation

#### 4. DISCUSSION

Delayed speech and language complaints are a common problem among preschool children (9). It has been reported that 6-7% of children have delays in speech and language development when they reach the school starting age (10).

In a study in which children aged 1-12 years who applied to pediatric outpatient clinics were screened, the prevalence of speech and language delay was reported as 2.53% (11). Due to the lack of a gold standard definition of speech and language delay (12) and methodological differences between studies, different rates are reported in studies investigating the prevalence of speech delay. However, it was also emphasized that the information about the prognosis is not consistent, it is not easy to define the predictors of the prognosis, and there are conflicting results between studies (13). In addition, there are very few studies in the literature on how the process progresses after the initial diagnosis, recovery, or encountering other problems.

Such studies are important because they can contribute to both the management of the process and the understanding of the systems in which speech and language development are related. Our study results, which aimed to examine the situation after the diagnosis of speech and language delay, showed that more than half of 105 randomly selected children had speech and language delay as the possibility of being a diagnostic marker of other disorders/diseases.

Moreover, our study was designed for children with normal peripheral hearing to eliminate the direct effect of hearing loss on speech and language development and to prevent delayed speech from affecting the possibility of being a diagnostic marker. As a limitation of our study, we should state that conventionally evaluating only the peripheral system is not sufficient to evaluate the effect of the auditory system on speech and language development.

One of the most important factors for speech and language development is the processing of auditory stimuli (7). For this processing, the peripheral and central auditory systems must work in harmony, otherwise this will negatively affect speech and language development (8).

There were no medical records regarding the evaluation of the participants in terms of auditory processing disorder after delayed speech and language diagnosis. The hearing system should be examined in two main parts peripheral and central hearing system. The peripheral hearing system can be evaluated with many tests starting from the neonatal period. However, due to the complex nature of the central auditory system, sufficient information cannot be collected about it in the first years of life (14). For this reason, children with normal peripheral hearing may be overlooked despite the risk of auditory processing disorder. Although the peripheral auditory system is within normal limits, there can be a problem in the central auditory system, which may affect speech and language development (15). Hence, central auditory system involvement should be considered in the diagnosis of speech and language delay and follow-up if necessary. In addition to the peripheral hearing systems of children with speech and language delays, central hearing systems should also be evaluated (15).

Speech and language develop together with biological, neurological, psychosocial, psychosexual, and cognitive processes and closely affect each other (16). External factors are as important as the characteristics of the individual in speech and language development. Attention should also be paid to issues such as receiving adequate auditory stimulus, establishing effective communication, and supporting social development. When these factors are not taken into account, there may be delays in speech and language development. Counseling should be offered to families regarding the importance of these external factors (17).

In our random selection, 51 (49 %) of our participants were diagnosed with only speech and language delay. 22 of the children survived the process only with expert advice (preventing screen exposure, social media support, effective communication, etc.), and 29 with both advice and speech-language therapy support. At the end of a period of about 1 year with speech and language therapy, children have reached the average level of speech and language development. This shows that psychosocial problems can be prevented by early diagnosis and intervention of speech and language delay. Their parents also reported that their children were not followed up in any medical department and they did not receive any warning from their teachers about their communication two years after the diagnosis. These reports are important because they inform us about the communication of cases in a real-life environment. On the other hand, the most important limitation of our study is that the cases were not evaluated face to face, but data were collected through telephone interviews with families. Therefore, data from the study are based on reports from families, with the possibility of recall or response bias. In cases where speech and language delay were diagnostic markers, autism spectrum disorder, general developmental delay, and attention deficit and hyperactivity disorder (ADHD) were frequently encountered. Early diagnosis and intervention are critical in terms of the effectiveness of treatment and rehabilitation, which will be applied in the first years of life using high neuroplasticity in such disorders (18).

Complaints of speech and language delay should not be ignored in terms of the probability of being a diagnostic marker. More detailed studies are needed to establish a relationship between follow-ups from other medical departments and speech development. Although indirect, speech and language delay can be a diagnostic marker or outcome for pathologies that affect important anatomical and physiological structures in speech development. Therefore, speech and language skills should be closely monitored. In addition, it is important to record medical conditions that can be a risk in terms of speech and language delay in the first years of life and to monitor them in terms of speech and language development. Many medical risk factors can cause speech and language delays. Such as; hearing loss, persistent otitis media, seizure disorder, birth asphyxia, low birth weight, preterm birth, and physical (oropharyngeal) deformity (8). While some of them have known mechanisms of action, some have different theories about them. For example, it is clearly stated in the literature that speech delay is more common in children with otitis media in early childhood (19). In our study, the highest rate was in children with a history of otitis media. Although our data is presented with small and descriptive statistics, it is valuable in terms of providing knowledge. It is also clear that this type of knowledge should be recorded, data should be created and the groundwork should be prepared for comprehensive studies.

Future medical follow-up of children diagnosed with speech and language delay is important in terms of providing data

on whether this delay will be a diagnostic marker. In the case of being a diagnostic marker, a detailed examination of its relationship with other disorders may also contribute to the understanding of delayed speech and language mechanisms. Although there are many studies on speech and language delay, it is thought that the few descriptive studies in the style of study we present will be useful in terms of drawing a general framework for speech-language development and the conditions in which it can be related. When taking the anamnesis of language-speech delay, it should be taken from a broad perspective, including the general health status of the patient. Timely diagnosis and early intervention should be made multidisciplinary manner with the necessary health professionals according to the patient's health needs (20). This can reduce the emotional, social, and cognitive deficits of speech and language delay and improve outcomes (20).

## 5. CONCLUSION

While speech and language delay diagnosed in early childhood can be a problem on its own, it can also be a symptom or result of other disorders in some cases. In our study, this rate was almost half. The reasons should be evaluated for the effective management of speech and language delay from multiple perspectives and the process management should be planned accordingly. It is also important to examine the medical conditions of children in middle and late childhood which are diagnosed in early childhood, in terms of providing information about possible scenarios and giving an idea about the approach to this population. Speech and language disorders will negatively affect the child's psychosocial, academic, and communication skills. Hence, the initial diagnosis and subsequent process should be followed closely, and early treatment/therapy interventions should be applied according to the needs of the child.

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## REFERENCES

- [1] Hebebrand J, Schulte-Körne G. Sprachentwicklung, Sprech und Sprachstörungen Language development, speech and language disorders. *Z. Kinder Jugendpsychiatr Psychother.* 2009 ;37(4):347-9.
- [2] Burden V, Stott CM, Forge J, Goodyer L. The Cambridge Language and Speech Project (CLASP). L Detection of language difficulties

- at 36 to 39 months. *Dev Med Child Neurol.* 2008;38(7):613-631. DOI:DOI:10.1111/j.1469-8749.1996.tb12126.x
- [3] McLaughlin MR. Speech and language delay in children. *Am Fam Physician*, 2011 May 15; 83(10), 1183–1188.
- [4] Beitchman NJ, Cohen, M, Konstantareas M, and Tannock R. (Eds) *Language, Learning, and Behavior Disorders: Developmental, biological, and clinical perspectives* (New York: Cambridge University Press), (1996). pp. 494–514.
- [5] Cohen NJ. Unsuspected language impairments in psychiatrically disturbed children: Developmental issues and associated conditions. In J.H. Beitchman, N.J. Cohen, M. Konstantareas, & R. Tannock (Eds.), *Language, Learning and Behavior Disorders*. 1996. (pp. 105–121). Cambridge: Cambridge University Press.
- [6] Morgans A, Ttofari EK, Pezic A, Brommeyer K, Mei C, Eadie P, Reilly S, Dodd B. Who to refer for speech therapy at 4 years of age versus who to watch and wait? *J Pediatr* 2017 Jun;185:200-4.e1. DOI: 10.1016/j.jpeds.2017.02.059
- [7] Lawrence R, Bateman N. 12 minute consultation: An evidence-based approach to the management of a child with speech and language delay. *Clin Otolaryngol.* 2013;38(2):148-153. DOI:10.1111/coa.12082
- [8] Sunderajan T, Kanhere SV. Speech and language delay in children: Prevalence and risk factors. *J Family Med Prim Care.* 2019;8(5):1642-1646. DOI: 10.4103/jfmpc.jfmpc\_162\_19.
- [9] Mohr B. Neuroplasticity and Functional Recovery after Intensive Language Therapy in Chronic Post Stroke Aphasia: Which Factors Are Relevant? *Front Hum Neurosci.* 2017 Jun 28;11:332. DOI: 10.3389/fnhum.2017.00332. PMID: 28701937; PMCID: PMC5487528.
- [10] Kim HS, Shin H, Yoon CH, Lee ES, Oh MK, Chun SW, Lim SK, Min HS, Byun H. The clinical features of preschool children with speech and language disorder and the role of maternal language. *Ann Rehabil Med.* 2021 Feb;45(1):16-23. DOI: 10.5535/arm.20129. Erratum in: *Ann Rehabil Med.* 2021;45(3):224.
- [11] Boyle J. Speech and language delays in preschool children: parents need information about the range of development, so they can spot early problems'. *BMJ* 2011;343:5181. DOI:10.1136/bmj.d5181
- [12] Peters TJ, Glogowska M, Enderby P. A 12-month follow-up of preschool children investigating the natural history of speech and language delay. *Child Care Health Dev* 2003;29:245-255. DOI:10.1046/j.1365-2214.
- [13] Bishop DVM. What causes specific language impairment in children? *Current Directions in Psychological Science.* *Curr Dir Psychol Sci* 2006;15:217-221. DOI:10.1111/j.1467 – 8721.2006.00439.x
- [14] Durante AS, Mariano S, Pachi PR. Auditory processing abilities in prematurely born children. *Early Hum Dev.* 2018;120:26-30. DOI:10.1016/j.earlhumdev.2018.03.011
- [15] Miller CA. Auditory processing theories of language disorders: past, present, and future. *Lang Speech Hear Serv Sch.* 2011;42(3):309-319. DOI:10.1044/0161-1461(2011/10-0040)
- [16] Kuhl PK. Learning and representation in speech and language. *Curr Opin Neurobiol.* 1994;4(6):812-822. DOI:10.1016/0959-4388(94)90128-7
- [17] Othman A. Child developmental delays and disorders: speech and language delay. *FP Essent.* 2021;510:17-21.
- [18] Nouraey P, Ayatollahi MA, Moghadas M. Late language emergence: A literature review. *Sultan Qaboos Univ Med J.* 2021;21(2): e182-e190. DOI:10.18295/squmj.2021.21.02.005.
- [19] Shriberg LD, Flipsen P Jr, Thielke H, Kwiatkowski J, Kertoy MK, Katcher ML, Nellis RA, Block MG. Risk for speech disorder associated with early recurrent otitis media with effusion: two retrospective studies. *J Speech Lang Hear Res.* 2000;43(1):79-99. DOI:10.1044/jslhr.4301.79
- [20] O'Hare A, Bremner L. Management of developmental speech and language disorders: Part 1. *Arch Dis Child.* 2016;101(3):272-277. DOI:10.1136/archdischild-2014-307394.

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