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# Speech delay in toddlers: Are they only "late talkers"?

Pınar Zengin-Akkuş, Tuba Çelen-Yoldaş, Gökçe Kurtipek, Elif Nursel Özmert

*Department of Pediatrics, Division of Developmental Pediatrics, Hacettepe University Faculty of Medicine Ankara, Turkey.*
*E-mail: pinarzengin@hacettepe.edu.tr*

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**SUMMARY: Zengin-Akkuş P, Çelen-Yoldaş T, Kurtipek G, Özmert EN. Speech delay in toddlers: Are they only "late talkers"?. Turk J Pediatr 2018; 60: 165-172.**

**Speech delay is prevalent in toddlers. Although some children with speech delay are able to catch up with their peers with time, the delay might be part of a broader condition such as global developmental delay, which requires specific diagnostic work-up. The current study aimed to present the demographic features, developmental profiles of the first 100 preschool-aged children who were seen at Hacettepe University İhsan Doğramacı Children's Hospital-Developmental Pediatrics Unit with parental concern of speech delay. Moreover, risk factors associated with speech delay, possible diagnosis and intervention strategies are documented. Thirty-one of 100 children were diagnosed with autism spectrum disorder (ASD) and global developmental delay (GDD). The current study presented that 4 out of 5 toddlers exceeded the recommended TV watching time. Moreover, almost one third of children had a poor linguistic home environment. Three parents whose children were diagnosed with ASD or GDD, refused to be reported as 'autism spectrum disorder' or 'intellectual disability' with the anxiety of labeling their child. As a result, these children were unable to receive special education paid for by the government. This study presented 31 of 100 children needed further diagnostic work up and early intervention. Therefore, pediatricians should not underestimate speech delay. On the other hand, due to the fact that, the regulations to receive special education and therapy often create anxiety for the parents, we think that this system needs to be updated and special education support should be determined by the special needs of each child.**

***Key words: early intervention, linguistic home environment, screen time, special education, speech delay.***

Language is consisted of two parts; receptive and expressive language. The first one refers to the ability of comprehension of communication; the second one is the use of words and gestures to convey messages to others. Speech is the vocalized form of communication.[1] Speech delays, in general, are prevalent problems in toddlers. Estimated prevalence rate of language delay ranges from 5% to 12% in preschool-aged children.[2] Expressive language delay, on the other hand, are reported in 13.5-17.5% of children at the age of 18-36 months.[3]

The "wait and see" strategy is widely used by clinicians in cases of speech delay in routine pediatric follow-up. Although some children with language delay are able to catch up with their peers with time, the rest are persistently delayed. Language delay is reported approximately 10-15% and 4-5% at the ages of 2 and 3, respectively.[4,5] If there is an isolated expressive language delay, prognosis is most probably favorable.[6] However, later educational achievement is adversely affected in children with severe speech and language disorders albeit intensive interventions.[7]

There are widely accepted ideas about "late talkers" in many cultures such as "boys talk later than girls", "his/her brother and father did also talk late but they are fine now", "he/she does not need to talk because he can tell us everything without talking". Such rationalizations may mislead family members and may result with late admission to the specialists and late diagnosis.

Speech delay might be derived from several

conditions, which require specific diagnostic work-up, such as hearing loss, intellectual disability, autism spectrum disorders or environmental deprivation. Language delay may predict neuropsychiatric or neurodevelopmental disorders such as autism spectrum disorders or attention-deficit/hyperactivity disorder and in later ages learning disorders.[8] This is a challenge experienced by clinicians to discriminate between the normal developmental variations and delay, which may benefit from early intervention and medical treatment. Medical, developmental, psychosocial and family histories are crucial to evaluate patients admitted with language delay. Isolated expressive language delay should be distinguished from language delay, which is a part of global developmental delay, via the evaluation of other domains of development. Hearing impairment should be suspected in all children with language delay and an audiologist should test the children despite universal newborn screening. In addition, poor linguistic environment is a risk factor for language delay. Therefore, environmental factors of delayed children should be assessed in this aspect.

In this study, we examined the characteristic and demographic features of preschool-aged children admitted to Hacettepe University İhsan Dogramacı Children Hospital Developmental Pediatrics clinic with a parental concern of speech delay. The current study aimed to evaluate the developmental profiles of patients across language, motor and cognitive domains to identify the risk factors known to be associated with speech delay such as male gender, family history, lower parental education and perinatal factors.[9] Moreover, diagnostic work-up, possible diagnosis and interventions are presented.

## Material and Methods

The current descriptive study reviewed the records of preschool-aged children admitted to Developmental Pediatrics Clinic of Hacettepe University Ihsan Dogramaci Children Hospital for initial assessment of suspected speech delay between the establishment of the department (June 2014) and October 2016. Approximately 160 children under the age of 5 years were evaluated for speech delay. Patients, who were previously diagnosed with a neurodevelopmental, neuropsychiatric, genetic or metabolic disorder were excluded. Finally, the first 100 patients whose parents stated a concern of speech delay were included. Data was obtained retrospectively from medical records. Medical history obtainment, physical examination, head circumference measurement and observation of child's play were performed by developmental pediatricians. In this study, all children were assessed in terms of developmental domains (cognitive, social-emotional, motor and language development) by using Denver Developmental Screening Test-II (Denver II). Global developmental delay (GDD) definition was used for the impairment of two or more developmental domains, such as speech/language, motor function, cognition, social/personal and activities of daily living.[10] Additionally, 21 patients were evaluated by using "The Bayley Scales of Infant and Toddler Development, Third Edition". Testers, who received special training, carried out the developmental assessment. Patients, whose developmental status were not able to be assessed by DENVER–II due to their inadequate cooperation, were evaluated by the adapted form of "Ages and Stages Questionnaires" for Turkish children[11] and "A Guide for Monitoring Child Development in Low- and Middle-income Countries"[12]. The questions about "daily book reading", "daily playing with child" and "screen time" were asked to check for the linguistic home environment and the quality of stimulus of children. Children, whose parents replied both of these two questions as "no", and, who had screen time above the recommendations of American Academy of Pediatrics (AAP), were accepted to have poor linguistic home environment.

After initial assessment, follow-up was recommended to all children with suspected speech delay. The recent status of patients, who have been regularly visiting the department for follow-up examinations, was obtained from records. Parents of patients, who did not come for follow-up visits, were contacted by telephone and asked about the current status of their children.

The "IBM SPSS Version 23.0" was used for the documentation and analysis of the data. Ethical approval of this retrospective study was obtained from Hacettepe University Ethics Committee on April 2017 (GO 17/273-12).

**Table I.** Sociodemographic Variables of Group (n:100).

| Sociodemographic variables | Frequency (%) |
|---|---|
| Age at admission | |
| <24 months | 9 |
| 24-36 months | 65 |
| >36 months | 26 |
| Gender | |
| Male | 71 |
| Female | 29 |
| Head circumference | |
| Normal | 91 |
| Microcephaly | 1 |
| Macrocephaly | 8 |
| Premature birth | 13 |
| Neonatal intensive care unit treatment | 4 |
| Maternal ages | |
| <20 years | 2 |
| 20–35 years | 67 |
| >35 years | 31 |
| Educational level of mother *(n:89) | |
| Primary | 25.8 |
| High school | 32.6 |
| College/University | 41.6 |
| Working status of mothers | |
| Working | 30 |
| Housewives | 70 |
| Birth order | |
| First born | 47 |
| Second born | 39 |
| Third or later born | 14 |
| Numbers of children at home | |
| 1 child | 43 |
| 2 children | 40 |
| 3 or more children | 17 |
| Positive family history of speech delay | 28 |
| Consanguineous marriage | 18 |
| Bilingualism | 4 |

* = Excluding missing data of 11 children

**Table II.** Possible Diagnosis of Children (n:100).

| Diagnosis | Numbers |
|---|---|
| Global developmental delay | 16 |
| Autism spectrum disorder | 15 |
| Isolated speech delay | 50 |
| Normal language development | 19 |

## Results

In the current study, 100 children with a median age of 33 months (16-59 months) were evaluated. Eight children had chronic disease such as asthma but none of them had been known to have neurologic, metabolic or genetic diseases before evaluation. Ages, working status, educational level and presence of social support of mothers were reported. Maternal educational levels were classified as primary school, high school and collage/university. Sixty-one percent of mothers stated that they had no social support. Sociodemographic features obtained from medical records are documented in Table I.

Sixteen of 100 patients had impairments at two or more developmental domains according to Denver-II. Six of these 16 patients, whom were also evaluated by BAYLEY-III, had low cognitive, expressive and receptive communication scores. Parents of 2/16 patients received the age-appropriate questionnaire of the ASQ regarding

**Table III.** Follow-up Results/Support of Children.

| Diagnosis | Numbers |
|---|---|
| Global developmental delay | 16 |
| Special education program | 12 |
| Hearing aid + special education program | 2 |
| Refused special education program | 1 |
| Missing | 1 |
| Autism spectrum disorder | 15 |
| Special education program | 10 |
| Refused special education program | 2 |
| Left special education program | 1 |
| Missing | 2 |
| Isolated speech delay | 50 |
| Talking strategies, kindergarten enrollment | 22 |
| Speech therapy | 21 |
| Refused speech therapy | 4 |
| Missing | 3 |
| Normal language development | 19 |
| No concern about development | 18 |
| Missing | 1 |

problem-solving domain to identify cognitive developmental delay. All of these 16 patients with GDD (Table II) and suspected intellectual disability were consulted to pediatric neurology department for further evaluation. Moreover, all these patients were checked for vision and hearing problems. Although they all had previously passed the newborn-hearing screening program, two patients were diagnosed with partial hearing loss. The follow-up results of these patients were documented in Table III. Parents of fourteen patients reported that their children attend special education programs and two of them with hearing loss use hearing aids. Parents of one patient informed us that they refused to receive special education program. Diagnostic work-up are on-going for these 15 patients, one of which was diagnosed with central nervous system malformation. Unfortunately, parents of one case could not be contacted.

In 15 patients admitted with speech delay, insufficient eye contact, lack of joint attention and atypical stereotypical behaviors accompanied. Impairments were detected at language and social/personal developmental domains of Denver-II. Four of these patients, to whom Denver-II test could not be applied, were evaluated by "Guide for Monitoring Child Development in Low- and Middle-Income Countries" in terms of expressive language, receptive language, gross and fine motor, relationship (social-emotional), play, and self-help skills domains. Relationship, language and play skills of these patients were found not to be as expected for their age. Patients suspected to have autistic features were referred to child psychiatry department. All 15 children, who met diagnostic criteria of DSM-5, were diagnosed with ASD (Table II). Currently ten of these patients were both attending pre-school education and special education programs. Parents of 2 patients refused to be reported as ASD and their children were not able to benefit from a special education program paid for by the government. One patient left the special education program because his parents believe it is inefficacious. Two other patients' data regarding their current status is missing.

Fifty of the children assessed by Denver-II, had impairment in only language domain but not in other domains. Bayley–III was also applied to 14 of these 50 patients with a concern of cognitive developmental delay and their scores were in normal range in cognitive and receptive communication domains but they had lower scores only at expressive language domain. Parents of these 50 children with isolated speech delay, were recommended to limit their child's screen time and read books to their child daily. Moreover, these parents were informed about communication strategies. Then, data about current statuses of their children were obtained. Parents of 22 children stated that they do not have any concern about their children's speech recently

and they benefited from our recommendations. Parents of 25 patients were also advised to visit a speech therapist. Although 21 of these parents decided to receive speech therapy, four other parents refused to receive. Data regarding current status of three other patients, on the other hand, is missing.

Nineteen of the children admitted to our clinic with a parental concern of speech delay had no developmental delay in any of the domains according to Denver-II and their language skills were similar to their peers (Table II). Based on the recent phone calls, parents of these 18 patients stated that they have no concern regarding their child's language development. The parents of one case could not be contacted.

Parents were asked about usual screen time, daycare status and background TV exposure of their children (Table IV). This study presents that 18% of patients with isolated expressive speech delay, 20% of patients with autism spectrum disorder (ASD), 6.2% of patients with global developmental delay (GDD) and 36.8% of patients with normal developmental status had screen time compatible with AAP recommendations ($p>0.05$). Screen time was assessed according to the educational level of mothers. Among mothers, who limit screen time of their child in accordance with AAP recommendations, 13.3% were educated at primary school level, 26.7% at high school and 60% at college/university level ($p>0.05$). When the relation between screen time and number of siblings was considered, 75% of children, whose screen time was proper for recommendations, were singleton or had one sibling. Only 38% of parents stated that they read books to their children daily and the rest of them said they never read a book, or read very rarely. In this study, parents were asked "Do you play with your child daily?" and 59% of parents answered this question as "yes", rest of them as "rarely or not daily" (Table IV). As a result, thirty-one children were accepted to have poor linguistic home environment. There was no statistically significant association between the diagnosis of patients and their linguistic home environment. Moreover, ages of admission to our department were examined regarding the diagnosis of patients in order to reveal whether the patients with GGD or ASD were admitted earlier or not, and it was found that there was actually no statistically significant difference between any patient groups. The participation involved informed consents.

## Discussion

Language impairment is thought to be multifactorial and affected by both genetic and environmental factors.[13] Gender is one of the factors affecting language development.[14,15] In this study, only 29 of the 100 children were female. Male predominance of the group is consistent with the literature.

Potential risk factors, which might affect language development, were evaluated in the current study. Parental education, socioeconomic status of family and birth order of children are known to be related with language skills of the child.[16-19] In the current study, 60% of mothers, whose children had limited screen time, were educated at college/university level. Moreover, 75% of children with proper screen time had one sibling or none. Although, the data is insufficient to associate results

**Table IV.** Features of Children Related with Home Environment (n:100).

| Features | Frequency (%) |
|---|---|
| Daycare status of children | |
| By mother | 67 |
| By grandparents | 22 |
| By a caretaker | 7 |
| In kindergarten | 4 |
| Daily book reading | 38 |
| Daily playing with children | 59 |
| Hour(s) of television watching per day | |
| <1 hour | 20 |
| 1-3 hours | 10 |
| >3 hours | 70 |
| Background TV exposure | 48 |

with possible risk factors (p>0.05), children, whose mothers have higher educational level and who have one or no sibling, have limited screen time. A positive family history is a known risk factor for speech and language delays and language impairments were found to show family aggregation.[9,20] In this group, 28 children were recorded as having a positive family history for "late talking". However, it should be noted that recall bias and limited data about other family members could affect the data.

Speech delay is found to be associated with deprivation and low stimulation in the home environment.[21,22] Although there are conflicting results about cognitive outcomes of television viewing in early childhood in the literature[23-25], excessive media exposure was reported to have detrimental effects on language development.[26-28] This study presents that 4 out of 5 toddlers with speech delay exceed the recommended TV watching time of AAP and 31% of children were accepted to have poor linguistic home environment. In this group of children, it was aimed to enhance the quality of psychosocial stimulation, communication skills via talking/communication strategies, and diminish screen exposure regardless of the diagnosis. Daily shared book reading[29] was recommended to all families. All parents are guided to follow the recommendations of AAP about the screen time.[30] In the current study, 22% of children improved their communication skills by following these recommendations according to their parents' statements.

Speech delay might be part of a broader condition such as GDD, or an initial presenting symptom of ASD.[31,32] In the current study, 15 patients were found to have an autism spectrum disorder. Sixteen patients had GDD and two of them had hearing loss. That means 31 of the patients need diagnostic work-up and may benefit from early interventions. Patients, who have GDD and are suspected to have intellectual disability, were referred to the pediatric neurology and the pediatric genetics department for further evaluation. All of these patients were screened for inborn errors of metabolism and thyroid dysfunction. Patients with GDD were guided to receive special education program, speech therapy and physical therapy regarding their needs. We emphasize that pediatricians should be aware of the importance of early distinction between speech delay, which is a part of a neurodevelopmental problem, and isolated expressive speech delay to lead parents for early and proper interventions. Moreover, patients with speech delay should be evaluated in terms of all developmental domains. All patients with a concern of speech delay should be tested for hearing loss regardless of the newborn screening.

Individualized early intervention strategies such as speech therapies, special education and preschool/kindergarten enrollment were discussed with parents. In Turkey, patients should be reported as a disease such as 'autism spectrum disorder', 'intellectual disability' according to International Classification of Diseases (ICD) codes in order to receive special education paid for by the government. Parents of two patients with ASD and one with GDD refused to be reported due to the anxiety of labelling their child, and as a result these children were unable to attend governmentally paid special education programs. The support required for children should be determined according to the special needs of the child, not an ICD code such as 'intellectual disability'. If this occurs, the anxiety of parents may diminish and more children can receive the support they need.

One of the limitations of this retrospective descriptive study is the lack of data about maternal depression, socioeconomic status of families and objective assessment for the quality of psychosocial stimulation. Another limitation is that all patient's developmental statuses could not be assessed by an identical method, since Bayley III and ASQ are used in terms of clinical suspicion about the cognitive status of children. Lastly, no statistically significant relation could be found mostly due to the limited number of patients.

The present study reports the demographic features of 100 patients admitted to Hacettepe University Ihsan Dogramaci Children's Hospital Developmental Pediatrics clinic with a parental complaint of speech delay. Moreover, risk factors, which are assumed to be associated with speech delay, possible diagnosis of patients and intervention strategies are documented. Sometimes, pediatricians may underestimate

speech delay; however, it might be an initial symptom of a serious disease, which benefits from early interventions, such as autism spectrum disorder, hearing loss or global developmental delay. For instance, in this study, 31 of 100 patients with suspected speech delay were diagnosed with a disorder needing early and proper intervention such as ASD or GDD.

In Turkey, the regulations to receive special education often create anxiety for the parents due to the fact that children with special needs must to be reported according to ICD codes, which can lead to the labelling of the child. Therefore, this system needs to be revised and special education support should instead be determined according to the special needs of each child.

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