

**Ministry Of Higher Education  
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Diyala University College of  
Medicine**



**Speech and language Delay in  
children: prevalence and risk factor  
at Al-Batool Teaching Hospital /  
Diyala province**

**A Scientific dissertation submitted to the College of  
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وقال تعالى: بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ)، «سورة المجادلة: الآية ١١»

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## **Abstract**

**Background :** Intelligible speech and language is a useful index for the general child development and his intellect. A speech and language disorder refers to an deterioration of speech or sound production, fluency, voice or language which remarkably affects children's educational performance or their social, emotional or professional development.

**Aims :** To study the prevalence and risk factors of speech-language delay among children aged 1-12 years in Diyala province through 2022-2023.

**Patient and method :** This cross-sectional study was include all children who attended to the Pediatrics out patient department (OPD) in AL Batool Teaching Hospital for Pediatric and Gynecology at Diyala province / Baquba distract from first of November 2022 to 30th of Jaunary 2023. 108 children (54 children with delayed speech and 54 controls) aged 1-12 years were included. The guardians of these children were requested to answer well structural questionnaire. This questionnaire was consist of 4 parts : the sociodemographic profile, medical , family based , and environmental risk factors for speech and language delay in children.

**Results :** Speech and Language delay was found in 54 out of 5575 (1.94%) children who attended the OPD aged 1-12 years with male 35 (64.8%) , female 19(35.2%) with moderate soicoeconmic state (64.8%). The risk factors found to be significant were : recurrent otitis media (P=0.001) , hearing loss (P=0.001) , seizure disorder

(P=0.013), multilingual family environment (P=0.048), and inadequate stimulation (P=0.001).

**Conclusions :** The prevalence of speech and language delay was 1.94%. and the medical risk factors were : recurrent otitis media , hearing loss , and seizure disorder . The familial causes was multilingual family environment . Inadequate stimulation regarding environmental factors .

### **Introduction:**

Developmental delay is diagnosed when a child does not achieve normal developmental milestones at the predictable age.[1]

Speech is the most important form of carriage information and it can only be made possible through language. Language essentially embodies the words relayed via verbal or non-verbal ways.[2]

Speech is the sound produced, while language is a measure of comprehension.[3]

The acquisition of intelligible speech and language is a useful index for the general child development and his intellect.[4]

A speech and language disorder refers to a deterioration of speech or sound production, fluency, voice or language which remarkably affects children's educational performance or their social, emotional or professional development , Or defined as when the child's

**conversational speech sample is either more inconsequential than would be predicated for age or is evident by speech sound error patterns not convenient for age.[5,6]**

**Evidence indicate that untreated speech and language delay can persist in 40%–60% of the children and these children are at a higher risk of social, emotional, behavioral, and cognitive problems in adulthood. Speech and language disorders need to be intervened into early. Delay in speech and language skills may be associated with other cognitive disorders including lower IQ scores, slower information processing skills and poorer literacy skills like reading and spelling . They are also known to have psychosocial deficits persisting to adulthood . [7]**

**Children with communication disorders frequently did not perform as predicated at grade level. They may dispute with reading, have difficulties in understanding and expressing language, misunderstand social cues, avoid attending school, poor social interaction, and under achieves in tests. Most speech and language disorders shown by school children are developmental, that is, roots of the problem exist from birth and manifestations of the problem emerge as the child develops and it becomes evident that is slower or atypical compared to peers. In a minority of cases, speech and language disorders are acquired when a child suffers from an illness or accident that affects brain function. This type of speech impairment is known as aphasia . [8]**

**There are several screening tests for speech and language disorders, however no single test has been regarded as a gold standard reference. At present, there is no concrete data to support the use of**

risk factor-based screening programs and no consensus on the optimal timing of screening .[9]

Speech and language disorders need to be intervened into early. A delay in diagnosis and management can lead to a permanent loss in cognitive development leading to low intelligent quotient (IQ), difficulty in communication, and illiteracy .[10,11]

Prevalence of speech delay has been difficult to estimate because classically there is a belief that speech delay may run in families and it is not a cause of alarm. Often a “wait-and-watch” policy leads to late diagnosis and intervention for speech delay. There is a vast majority of evidence in the support of speech therapy in the setting of these disorders. Idiopathic etiologies have a better prognosis. An assessment of risk factors could lead to devising strategies in achieving the prevention of these disorders. Hearing loss is a good-credible cause of speech delay.[12,13]

However, the causes of speech–language delay are compound and represent an sophisticatel relationship between the biological development and social environment in which the child learns to speak.[13]

A delay in speech development may be a symptom of many disorders, including mental retardation, hearing loss, an expressive language disorder, psychosocial deprivation, autism, elective mutism, receptive aphasia and cerebral palsy. Speech delay may be secondary to maturation delay or bilingualism. Being familiar with the factors to look for when taking the history and performing the physical examination allows physicians to make a prompt diagnosis. Timely

detection and early intervention may mitigate the emotional, social and cognitive deficits of this disability and improve the outcome. [16]

### **Aims of the study:**

To study the prevalence and risk factors of speech-language delay among children aged 1-12 years at Diyala province through 2022-2023 .

### **Patient and method :**

This cross-sectional study was include all children who attended to the Pediatrics out patient department in AL Batool Teaching Hospital for Pediatric and Gynecology at Diyala province / Baquba distract from first of November 2022 to 30th of Jaunary 2023.

Each sequential child (age 1–12 years) who was bring by caregivers for suspected delayed speech or who was referred specifically for speech delay every child undergoing speech therapy was included.

A total of 54 children formed the study group and 54 children without speech-language delay were recorded as the control group after obtaining consent from their guardians.

Data were collected using a well-structured questionnaire after obtaining informed consent. The questionnaire consisted of four main parts. Sociodemographic profile, Medical risk factors, family-based risk factors, and environmental factors. Data were collected with the help of face-to-face interviews with attendants of patients



(children). Every child with any evidence of autistic disorder was excluded.

#### **Sociodemographic profile :**

- **Age**
- **Sex : male ,female**
- **Socioeconomic class : low , moderate and high**

#### **Medical risk factors :**

- **History of recurrent otitis media**
- **Hearing loss**
- **Seizure disorder**
- **Birth asphyxia**
- **Low birth weight**
- **Preterm birth**
- **Physical factor(oropharyngeal problems)**

#### **Family-based risk factors :**

- **Multilingual family environment**
- **Family history of speech disorder**
- **Large family size**
- **Mother education: Primary, secondary and high education**
- **Father education: Primary , secondary and high education**
- **Mother-child separation**
- **Consanguinity**
- **High birth order**

### **Environmental factors :**

- **Trauma**
- **Chronic noise exposure >65 db**
- **Television watch >2 h r**
- **Inadequate stimulation**

### **Statistical analysis :**

**Data entry was done using Microsoft Excel 2007 and was analyzed using Statistical Package for Social Sciences (SPSS) software, version 16 . Descriptive analysis was presented as mean, standard deviation, and frequency. Statistical tests of significance used were unpaired t-test, Chi-square test, and Fisher's exact test. A P value of less than 0.05 was taken as statistically significant.**

### **Reuslts :**

**A total of 5575 children belong to the age group 1–12 years attended the pediatric department during the study period. In all, 54 children (1.94%) were found to have speech and language delay.**

**In table 1 : We found speech and language delay in 35(64.8%) male , 19(35.2%) female with male : female ratio is 1.84 , with moderate soicoeconmic state (64.8%).**

**Table 1: Comparison of baseline characteristics between study and control groups**

Characteristic	Study group (n=54)	Control group (n=54)	P value
Age	4.31	4.48	0.212*
Gender			
Male	35(64.8%)	25(46.3%)	0.053*
Female	19(35.2%)	29(53.7%)	
soicoeconomic state			
Low	17(31.5%)	7(13%)	
Moderate	35(64.8%)	44(81.5%)	0.067*
High	2(3.7%)	3(5.6%)	

\*chi-square test \*\*unpaired t-test \*\*\* fisher's exact test , p value<0.05 is statistically significant

In table 2 : We found : recurrent otitis media (P=0.001) , hearing loss (P=0.001) , seizure disorder (P=0.013) to be statistically significant risk factors.

**Table 2: Comparison of medical risk factors for speech-language delay between study and control groups**

<b>Factors</b>	<b>Study group (n=54)</b>	<b>Control group (n=54)</b>	<b>P value</b>
<b>Hearing loss</b>	<b>8(14.8%)</b>	<b>0(0%)</b>	<b>0.001***</b>
<b>Recurrent otitis media</b>	<b>32(32.6%)</b>	<b>3(3.7%)</b>	<b>0.001***</b>
<b>Seizure disorder</b>	<b>23(42.6%)</b>	<b>11(20.4%)</b>	<b>0.013*</b>
<b>Birth asphyxia</b>	<b>16(26.6%)</b>	<b>8(14.8%)</b>	<b>0.064*</b>
<b>Low birth weight</b>	<b>6(11.1%)</b>	<b>5(9.3%)</b>	<b>0.750*</b>
<b>Preterm birth</b>	<b>6(11.1%)</b>	<b>4(7.4%)</b>	<b>0.740***</b>
<b>Physical (pharyngeal-oro) disorder</b>	<b>13(24.1%)</b>	<b>0(0%)</b>	<b>0.000***</b>

\*chi-square test \*\*unpaired t-test \*\*\* fisher's exact test , p value<0.05 is statistically significant

**In table 3 : we found multilingual family environment (P=0.048) to be statistically significant risk factors.**

**Table 3: Comparison of family-based risk factors for speech-language delay between study and control groups**

<b>Factors</b>	<b>Study group (n=54)</b>	<b>Control group (n=54)</b>	<b>P value</b>
<b>Multilingual family environment</b>	<b>6(11.1%)</b>	<b>14(35.9%)</b>	<b>0.048*</b>
<b>Family history of speech disorder</b>	<b>14(25.9%)</b>	<b>14(25.9%)</b>	<b>0.000*</b>
<b>Large family size</b>	<b>16(29.6%)</b>	<b>16(29.6%)</b>	<b>0.000*</b>
<b>Father education</b>			
<b>Primary</b>	<b>26(48.1%)</b>	<b>23(42.6%)</b>	
<b>Secondary</b>	<b>15(27.8%)</b>	<b>9(16.7%)</b>	<b>0.135*</b>
<b>High education</b>	<b>13(24.1%)</b>	<b>22(40.7%)</b>	
<b>Mother education</b>			
<b>Primary</b>	<b>30(55.6%)</b>	<b>18(33.3%)</b>	
<b>Secondary</b>	<b>11(20.4%)</b>	<b>16(29.6%)</b>	<b>0.067*</b>
<b>High education</b>	<b>13(24.1%)</b>	<b>20(37.0%)</b>	

<b>child separation-Mother</b>	<b>4(7.4%)</b>	<b>4(7.4%)</b>	<b>1.000***</b>
<b>Consanguinity</b>	<b>35(64.8%)</b>	<b>35(64.8%)</b>	<b>1.000*</b>
<b>High birth order</b>	<b>17(31.5%)</b>	<b>16(29.6%)</b>	<b>0.835*</b>

\*chi-square test \*\*unpaired t-test \*\*\* fisher's exact test , p value<0.05 is statistically significant

In table 4 : we found inadequate stimulation (P=0.001) to be statistically significant risk factors.

**Table 4: Comparison of environmental risk factors for speech-language delay**

<b>Factors</b>	<b>Study group (n=54)</b>	<b>Control group (n=54)</b>	<b>P value</b>
<b>Trauma</b>	<b>6(5.6%)</b>	<b>6(5.6%)</b>	<b>1.000***</b>
<b>Chronic noise exposure &gt; 65db</b>	<b>3(2.8%)</b>	<b>3(2.8%)</b>	<b>0.000*</b>
<b>Television watch &gt;2 hr</b>	<b>35(32.4%)</b>	<b>39(36.1%)</b>	<b>0.407*</b>
<b>Inadequate stimulation</b>	<b>17(15.7%)</b>	<b>3(2.8%)</b>	<b>0.001*</b>

\*chi-square test \*\*unpaired t-test \*\*\* fisher's exact test , p value<0.05 is statistically significant

## **Discussion :**

In our study, the prevalence of speech–language delay was found in 1.94% of the children that was attending to pediatric OPD which is nearly similar to other study done by Trisha Sunderajan [2], these result are similar to prevalence reported from developed countries range from 2-8% [4,23] , with a higher incidence of speech–language delay among males (64.8%) which is similar to a study done by Trisha Sunderajan [2] , and attributed to the slower maturation of the central nervous system among boys and also by the effect of testosterone which stops cell death and makes proper connections difficult.

Regarding medical factors , in this study we found recurrent otitis media ( $P=0.001$ ) , hearing loss ( $P=0.001$ ), and seizure disorder ( $P=0.013$ ) to be statistically significant risk factors.

We found the effect of recurrent otitis media on speech delay which is similar to study reported by Mondal N.[21] This may explained as chronic recurrent otitis media can impaired hearing and result in delay speech-language.

The epilepsy also has effect on speech–language that reported by Mehta B et al [14] . The hypoxic insult to the brain during a seizure could prove harmful in various areas of development and can appear as speech and language delay.

Hearing loss has been involved in delayed language acquisition which is similar to study done by Wooles N. [12]

**The effect of birth asphyxia on speech and language delay has been documented by Stanton-Chapman TL study. [20] In our study we not seen that.**

**The non\_medical risk factors include two groups : family-based risk factors and environmental risk factors.**

**Regarding the family based risk factors studied we found : multilingual family environment (P=0.048) which is similar to study reported by Trisha Sunderajan. [2] A multilingual home environment may confuse the child during the early stages of learning a language .**

**Our study showed that the affected children that had a family history of language or speech disorders (P=0.000) that 25.9% of children had a previous family history of speech and language delay, with similar percentage in control group, this mean a family history is not a significant factor in contrast to other studies done by Barry et al. [21,22]**

**We found a large family size (P=0.000) irrespective it was 29.6% in both study and control groups, so it not a significant factor in speech delay .**

**Consanguinity, low paternal education, and low maternal education were be a risk factor for speech and language delay that reported by Trisha Sunderajan [2] , while this study not document this .**

**The environmental factors studies : we found inadequate stimulation (P=0.001) which similar to study reported by Leung AK, etal. [15]**



**The role of a inadequate stimulating environment at home, that lead child neglect and does not hear other speaking so they will not learn to speak which has been reported previously by Singer LT, etal . [17]**

**The television waching that began at less than 2years for more than 2h in a day were nearly at a six times higher risk of developing delayed language and speech that reported by Premkumar B study .[19] In our study this has been not significant risk factors , this may be related to sample size.**

### **Conclusion :**

**The prevalence of speech and language delay was 1.94% and the risk factors associated include both biological and environmental. The medical risk factors were : recurrent otitis media, hearing loss and seizure disorder. The familial and environmental factors were: multilingual family environment, and inadequate stimulation .**

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