Original Article

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Paediatrics Section

Speech Delay among Children Aged up to 6 Years Using the Language Evaluation Scale-Trivandrum: A Cross-Sectional Study

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ABSTRACT

Introduction: Delay in language milestones is the most common developmental delay, and awareness is essential for early identification and appropriate intervention. Speech and language disorders are one of the main reasons for referral to paediatric services, accounting for about 40% of cases.

Aim: The present study aimed to determine the prevalence of speech delay in the Paediatric Outpatient Department (OPD) using the Language Evaluation Scale Trivandrum (LEST) scale and to analyse the possible risk factors associated with speech delay.

Materials and Methods: The present cross-sectional study was conducted in the well-baby clinic and daily Paediatric Outpatient Department of East Point College of Medical Sciences and Research Centre, Bengaluru, Karnataka, India, from January 2021 to January 2022. A total of 204 children aged 0-6 years attending the paediatric OPD were evaluated using LEST. The prevalence and association with risk factors in each age group were calculated and analysed using Statistical Package for the Social Sciences (SPSS) version 22.0. The Chi-square test was used for statistical analysis, and a p-value <0.05 was considered significant.

Results: The prevalence of speech delay in the present study was present in children (19.6%). Of the total 204 children, the majority of language delay cases (20; 50%) were in the 1-5 year age group. Language delay was 1.8 times more common in boys than in girls. Most children (20; 50%) belonged to nuclear families. A total of 34 children (85%) were from monolingual households where only one language was spoken at home. Twenty-two children two-item delay, 10 had three-item delay & 8 had three-item item delayed, indicating that early identification and intervention were possible.

Conclusion: Awareness and early identification are essential for better outcomes in speech delay. Simple and easy-to-administer scales like LEST are necessary for use in busy outpatient departments.

Keywords: Developmental disorder, Intellectual disability, Language delay, Social communication

INTRODUCTION

Language is a dynamic process and a means of communication, and its development occurs sequentially. Language development occurs with the maturation of the brain, which happens predominantly between three and five years of age. Delay in the speech and language domain is the most common developmental disorder in children [1]. Language developmental delay is the most sensitive indicator of intellectual disability and a marker for autism spectrum disorder, social communication disorder, and specific learning disorders [1]. Speech problems may include fluency disorders, articulation disorders, and disorders related to unusual voice quality [1]. Early detection of language delay is essential and forms the cornerstone of early intervention. Indian studies report that the prevalence of language delay in children aged two to seven years ranges from 2% to 30% [1-3]. Language delay accounts for nearly 40% of referrals to Paediatric Departments [1]. Hence, it is necessary to include a simple screening tool in outpatient services to identify language delay [1-3]. LEST (0-3 years) is a tool used to assess speech delay in children aged 0 to 36 months and consists of 33 items. LEST (3-6 years) is used for children aged 36 to 72 months and consists of 31 items [3-6]. The interpretation is done in two ways:

1. Normal-all items completed

2. Delay-two or more items not completed [2-4].

Previous studies conducted in children aged 0-3 years [2,3] demonstrated a high prevalence of speech and language delays in children attending well-baby clinics. These delays were observed even in apparently healthy children brought for vaccination or routine check-ups. The studies concluded that LEST is easy to administer, time-efficient, and feasible for use in busy outpatient departments [2,3]. The study by Nair MK et al., expanded the scope to include children aged 3-6 years as well [3]. Their results confirmed that LEST for 3-6 years has strong psychometric properties, with high reliability and validity in measuring receptive, expressive, and pragmatic language skills. This validation is crucial, as it ensures that the tool identifies delays accurately and consistently across different populations.

The preschool years represent a period of rapid language acquisition, social communication development, and school readiness. The findings from the present study underscore the importance of continued developmental surveillance beyond infancy, highlighting that structured assessment during the preschool years is equally essential for early detection of language difficulties. Existing studies are largely available for the 0-3 year age group [2-4], whereas literature for the 3-6 year age group is sparse, despite a possible increase in prevalence in recent years. Hence, the present study was conducted to assess the prevalence of speech delay in children aged 0-6 years using the LEST scale and to analyse the sociodemographic profile of children with speech delay in a multilingual metropolitan city with a predominantly migratory population.

MATERIALS AND METHODS

The present cross-sectional study was conducted in the Paediatric Outpatient Department (OPD) for one year, from January 2021 to January 2022, at a tertiary care centre, East Point College of Medical Sciences and Research Centre, Bengaluru, Karnataka, India. The study was approved by the Institutional Ethics Committee (EPCMSRC/ADM/IEC/2021-22/10). Children were recruited after obtaining informed consent from their parents.

Inclusion criteria: Children aged 0-6 years who attended the well-baby clinic during the study period were included.

Exclusion criteria: Children were excluded if parental consent was not obtained.

Study Procedure

All consecutive children aged 0-6 years attending the Paediatric OPD during the study period were enrolled using simple random sampling. Sociodemographic details such as age, sex, parental education, and socioeconomic status were recorded using a predesigned proforma. Anthropometric measurements and upper respiratory tract examinations were performed to rule out local causes of hearing impairment such as adenoids and ear wax.

Speech and language assessment was carried out using the validated Language Evaluation Scale Trivandrum (LEST), developed by the Child Development Centre (CDC), Trivandrum. LEST is divided into two sections: LEST (0-3) for children aged 0-36 months, consisting of 33 items, and LEST (3-6) for children aged 36-72 months, consisting of 31 items [1,3]. The interpretation was done in two ways:

1. Normal- all items completed

2. Delay- two or more items not completed

Children were further grouped based on the number of delayed items: two-item delay, three-item delay, and more than three-item delay.

STATISTICAL ANALYSIS

The collected data were entered into Microsoft Excel and analysed using SPSS version 22.0. Descriptive statistics such as frequency and percentage were used for categorical variables. Continuous variables were expressed as mean and standard deviation, as well as median and interquartile range. The Chi-square test was used for inferential analysis, and a p-value of less than 0.05 was considered statistically significant.

RESULTS

All consecutive children aged 0-6 years attending the well-baby clinic were screened using LEST. Of the 204 children screened, 40 were found to have language delay, giving a prevalence of 19.6%. Among the 40 children with speech delay, 26 (65%) were boys and 14 (35%) were girls. The gender difference between the delay and no-delay groups was statistically significant. Regarding age distribution, 2 children (12.5%) were younger than six months, 4 (14.8%) were between six months and one year, 16 (29.6%) were in the 1-3-year age group, and 18 (16.8%) were in the 3-6-year age group. Although the age difference was not statistically significant, language delay was more common in the toddler age group.

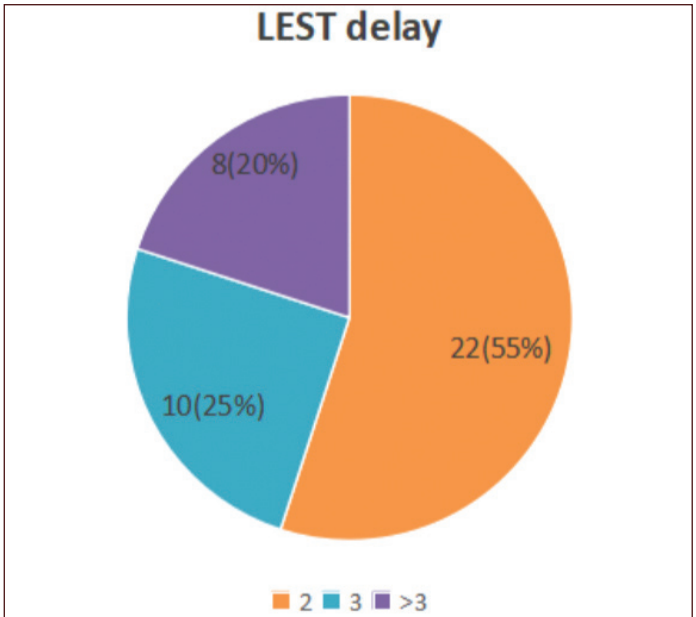
Among mothers of children with language delay, 18 (21.4%) were aged 20-30 years, 20 (20.4%) were aged 30-40 years, and 2 (9.1%) were older than 40 years. The mean maternal age in the delayed group was 31.6 years, compared with 32.26 years in the normal group. Maternal age showed no significant association with language delay. Analysis of maternal education revealed that children with language delay more commonly had mothers with illiterate or primary-level education, whereas in the normal group, most mothers were graduates or professionals. This difference was statistically significant (p=0.011) [Table/Fig-1].

Variables		Delay (n=40)	No Delay (n=164)	p-value
Gender	Male	26 (25%)	78 (75%)	0.048*
	Female	14 (14%)	86 (86%)	
Age	0-6 months	2 (12.5%)	14 (87.5%)	0.215
	6 months- 1 year	4 (14.8%)	23 (85.2%)	
	1-3 years	16 (29.6%)	38 (70.4%)	
	3-6 years	18 (16.8%)	89 (83.2%)	
Maternal age	20-30 years	18 (21.4%)	66 (78.6%)	0.481
	31-40 years	20 (20.4%)	78 (79.6%)	
	>40 years	2 (9.1%)	20 (90.9%)	
	Mean±SD	31.6±4.26	32.26±5.97	0.426
Mothers education	Illiterate	10 (21.7%)	36 (78.3%)	0.011*
	Primary	8 (57.1%)	6 (42.9%)	
	Middle school	2 (6.2%)	30 (93.8%)	
	High school	6 (17.6%)	28 (82.4%)	
	Graduate	8 (20%)	32 (80%)	
	Professional	6 (15.8%)	32 (84.2%)	
Fathers education	Illiterate	8 (36.4%)	14 (63.6%)	0.072
	Primary	0 (0.0%)	2 (100%)	
	Middle school	10 (23.8%)	32 (76.2%)	
	High school	4 (8.3%)	44 (91.7%)	
	Graduate	12 (24%)	38 (76%)	
	Professional	6 (15%)	34 (85%)	
SES	I	10 (18.5%)	44 (81.5%)	0.234
	II	8 (26.7%)	22 (73.3%)	
	III	12 (14%)	74 (86%)	
	IV	6 (27.3%)	16 (72.7%)	
	V	4 (33.3%)	8 (66.7%)	
Type of family	Nuclear	20 (18.9%)	86 (81.1%)	0.003
	Joint	8 (57.1%)	6 (42.9%)	
	Ext Nuclear	12 (14.3%)	72 (85.7%)	
Birth order	1	27 (20.9%)	102 (79.1%)	0.467
	2	13 (20.6%)	50 (79.4%)	
	3	0 (0.0%)	10 (100%)	
	4	0 (0.0%)	2 (100%)	
Languages Spoken	1	34 (19.5%)	140 (80.5%)	0.011*
	2	2 (8.3%)	22 (91.7%)	
	3	4 (66.7%)	2 (33.3%)	

[Table/Fig-1]: Analysis of prevalence of speech delay with risk factors.
*Statistically significant

Paternal education, socioeconomic status, and birth order did not show a significant association with language delay.

According to LEST scoring, 22 children had a two-item delay, 10 had a three-item delay, and 8 had more than three-item delays. Since two or more delayed items were considered abnormal, approximately 70% of children with speech delay had a two-item delay [Table/Fig-2].



[Table/Fig-2]: Categories of language delay according to LEST.

DISCUSSION

Language and communication are active processes. The LEST, developed at the Child Development Centre (CDC), is a simple screening tool used to detect speech and language delay during the critical period of development. Early detection and early intervention are crucial, as parental awareness of speech delay is often delayed. Delay in speech and language development is the most common developmental disorder in children. To quote the doyen M.K.C. Nair verbatim: "Delay in acquiring language development is often an early and most sensitive indicator of intellectual disability, pervasive developmental disorder, and specific learning disorder" [5].

Gross motor delay predominates in the first year of life, fine motor delay is more evident in the second year, while language delay and social communication difficulties predominate in the third and fourth years. In older preschool and elementary school children, developmental coordination disorders, behavioural disorders, and learning difficulties are more commonly reported [3,5].

Several attempts have been made to screen and assess children for speech and language delay due to the need for systematic and scientific evaluation. The prevalence of speech delay in the present study was 19.6%, which is comparable to other Indian studies reporting rates ranging from 5% to 30% [Table/Fig-3] [5-12].

Study	Place	Year	Sample size	Prevalence of speech delay
Dharmalingam A et al., [5]	Pondicherry	2014	400	9.54%
Jacob SK [6]	Kochi	2014	450	5.5%
Mondal N et al., [7]	Pondicherry	2014	200	27%
Ganavi R et al., [8]	Chennai	2015	200	20%
Singraiah A et al., [9]	Mangalore	2016	100	16%
Belgin P et al., [10]	Kerala	2017	400	30%
Rajeswari N and Lavanya R [11]	Chennai	2018	200	19%
Raju A and Bharanidharan S [12]	Chennai	2020	350	6%
Present study	Bengaluru	2025	204	19.6%

[Table/Fig-3]: Comparison of prevalence in different studies [5-12].

In a study by Singraiah A et al., involving 100 children aged 3-6 years, both LEST and REELS were administered. The prevalence of speech and language delay was 16%. The authors concluded that LEST (3-6 years) is a simple, reliable, and valid Indian tool for identifying language delay in hospital settings, with acceptable sensitivity, specificity, positive predictive value, and likelihood ratios [9].

Some studies have reported a higher prevalence of speech delay in girls, which contrasts with the present findings and those of Premkumar B et al., and Ganavi R et al., [8,10]. In general, language development is considered to be better in girls than in boys [11].

Socioeconomic disadvantage is often associated with poor nutrition, inadequate hygiene, limited parental education, insufficient stimulation at home, poor schooling, and suboptimal physical environments, all of which may contribute to delayed language development. However, socioeconomic status did not show a significant association with language delay in the present study, which is consistent with findings from other studies [8,10,12,13].

Maternal education and type of family showed a significant association with language delay in the present study, although this was not supported by studies from Pondicherry and Mangalore. Better-educated mothers tend to communicate more with their children and use a wider and more complex vocabulary, thereby providing a cognitively enriched environment that enhances language development. Maternal education therefore serves as a proxy indicator of the quality of the home environment provided to children [9,10,12].

Other factors such as birth order, paternal education, and maternal age did not show a significant association with speech delay in this study, which aligns with the findings of Ganavi R et al., and Abraham B et al., [8,14].

Limitation(s)

The major limitation of the present study is that it was hospital-based. Additionally, children with global developmental delay and those with isolated speech delay could have been analysed separately for more precise interpretation.

CONCLUSION(S)

The present study assessed the prevalence and risk factors associated with speech and language delay in children aged 0-6 years using the LEST tool. The overall prevalence of language delay was 19.6%, which falls within the range reported by similar Indian studies. The findings indicate that male gender, maternal education level, type of family, and multilingual exposure were significantly associated with delayed language development. Maternal age, paternal education, socioeconomic status, and birth order did not show a significant influence. The study highlights the importance of early screening and detection of language delay, particularly during the critical developmental window of 1-3 years. The LEST tool proved to be a simple, reliable, and effective screening method suitable for routine paediatric practice. Enhancing parental awareness, promoting early intervention, and encouraging language-rich home environments can substantially improve speech and language outcomes in young children. There should be no "wait and watch" approach, as was commonly practised in the past.

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