

Original Article

Assessment of Speech and Language Delay using Language Evaluation Scale Trivandrum(LEST 0-3)

Ganavi R*, Anitha E**, Uma Devi L***

*Assistant Professor, ** Senior Resident, *** Professor & HOD, Dept. of Pediatrics, Chettinad Hospital & Research Institute, Chennai, India.



Dr.R.Ganavi presently working as Assistant Professor Department of Pediatrics, obtained her M.B.B.S degree from the Vijayanagar Institute of Medical Sciences, Bellary, Karnataka in 2000 and her M.D degree in Paediatrics from Bangalore Medical College and Research Institute, Bangalore, Karnataka in 2010. She worked in JJ Group of Hospitals, Grant Medical College, Mumbai for a year following Postgraduation. She is a BPNI Certified Infant and young child feeding counseling specialist. She joined the present institution as Assistant Professor in 2012 and her area of interest is developmental Pediatrics and she has been qualified as developmental pediatrician after completing the course of postgraduate diploma in development neurology from Child development center, University of Kerala and under went training at KEM hospital Pune last year and currently running the neurodevelopment clinic in the Dept. of Pediatrics.

Corresponding author - Ganavi R (ggganavio@gmail.com)

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Abstract

Developmental Delay in speech and language domain is the most common developmental disorder in children. Awareness of the delay is very important because early identification definitely paves a way for appropriate intervention and prevention of consequences.

Aims and Objectives: To assess the prevalence of speech and language delay among 0-3 year old children using Language Evaluation Scale Trivandrum(LEST). To study the modifiable risk factors in speech and language delay among 0-3 year old children.

Study design & period : Descriptive study & 6 months

Study population: Children attending well baby clinic and daily pediatric clinic of a tertiary care centre, Chettinad hospital and Research institute, of age group birth to three years. Children with severe illnesses admitted in the hospital and those with developmental delay in other domains like gross motor, fine motor and social were excluded.

Sample size: 200 Children

Study tools: 1. LEST 0-3 years, 2. Risk factor assessment questionnaire

Results : Of the 200 children, 6.5% had delay, 18% had questionable delay and another 18% had suspectable delay. The effect of home environment on speech and language delay showed that in poor home environment 43% of children had delay and 57% were normal. Language delay was more prevalent among first birth child. There was no association found between the other demographic variables.

Conclusion : Using this simple tool LEST scale, we can identify those children with delay in language development and intervene early to prevent further consequences and abnormalities.

Key Words: Speech, Language delay, LEST

Introduction

In children speech and language development is a dynamic process. Speech relates to mechanics of oral communication or the motor act of communication of verbal expressions. Language includes the understanding, processing, and production of communication¹. Language encompasses every means of communication in which thoughts and feelings are symbolized, so as to convey meaning to others. It includes such widely differing forms of communication as writing, speaking, sign language, facial expression, gesture and art^{2,3}. Language development occurs in a sequential fashion and as age advances the child has more to communicate, first learning to listen and understand language before they learn to talk.

and secondly, the expressive language where the child says or does convey, what he/she wants to communicate⁴.

Several forms of speech and language disorders have been described¹. Speech problems consists of stuttering or dysfluency, articulation disorders, or disorders related to unusual voice quality. Expressive language delay may exist without receptive language delay, but they often are found together in children.

Some children may also have disordered language. These language problems can be in relation to difficulty with grammar (syntax), words or vocabulary (semantics), the rules and system for speech sound production (phonology), units of word meaning (morphology), and the use of language particularly in social contexts (pragmatics). Speech and language problems can exist together or separately^{5,6}.

Language can be divided into two major components. Firstly, the receptive language where the child understands from verbal and non-verbal communication,

There are number of approaches for assessing children for speech and language delay although there is no uniformly accepted screening technique for use in a primary care setting. Milestones for speech and language development in young children are usually looked into during the well baby visits⁷. Concerns for delay arise if there are no verbalizations by the age of 1, if speech is not clear, or if speech or language is different from that of other children of the same age and its usually by the parent. So, parent questionnaires and parent concern are often used to detect delay⁸.

The reported prevalence of language delay so far, in children two to seven years of age ranges from 2.3 to 19 percent⁹⁻¹³. Severe speech and language disorders in young children can definitely have negative impact in the later educational achievement, even after intensive intervention¹⁴. Several studies also have shown that children with speech and language disorders at two and a half to five years of age present with difficulty reading in the elementary school years¹⁵⁻¹⁷. Children in whom speech and language impairments has been found to persist past five and a half years of age have an increased incidence of attention and social difficulties¹⁸. Children who have specific speech and language impairments at seven and a half to 13 years of age have impaired writing skills, with marked deficits in spelling and punctuation compared with children without speech and language impairments^{19,20}.

Preschool children with speech and language delay show a tendency of being at increased risk for learning disabilities once they reach school age²¹. They may have difficulty reading in grade school¹⁸, exhibit poor reading skills at age 7 or 8^{17,18} and have difficulty with written language¹⁹, in particular. This may lead to overall academic underachievement¹⁴, and, in some cases, lower IQ scores¹¹ that may persist into young adulthood²². As adults, children with phonological difficulties may hold lower skilled jobs than their siblings who don't have any such difficulties²³. In addition to persisting speech and language related underachievement (verbal, reading, spelling), language delayed children exhibit more behavior problems and impaired psychosocial adjustment^{24,25}. Early identification and early intervention in children speech and language delay can prevent other consequences.

Material and methods

This descriptive study was conducted in the Dept. of Pediatrics Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu, with 200 children attending Paediatric Out patient department of a tertiary care centre, of age group birth to three years over 6 months period. Ethics committee approval was obtained for the study. Children with severe illnesses admitted in the hospital and those with developmental delay in other domains like gross motor, fine motor and social were excluded.

The study was done using a predesigned proforma consisting of the socio demographic parameters like age, sex, religion, family order. Birth details like mode of delivery, birth weight, any antenatal, natal or post natal problems. Maternal details and paternal details of

age; education and occupational status were also assessed. Place of residence, type of family, numbers of family members were also noted. The socioeconomic class is assessed using Modified Kuppaswamy Scale²⁶.

Then we asked the parents to fill in pre designed proforma, home screening questionnaire, where 30 questions were designed about how the child's time is spent and some of the activities of your family like visiting relatives house, talking to the baby, reading books, telling stories, baby sitters or anyone to take care of the child, any pets at home, any plants at home, how many hours spent playing with the child, shopping, television viewing and so on. A score was given to each of the response. The total score was calculated. Interpretation of the total score ≤ 19 means child has Negative home environment and total score of ≥ 20 means child has a Positive home environment. The speech and language assessment was done using Language Evaluation Scale Trivandrum (LEST) which was developed by Child Development Centre, Trivandrum⁴.

LEST (0-3 years) is a valid simple Indian tool for identifying children of 0-3 years with language delay in the community with an acceptable sensitivity, specificity, positive predictive value and likelihood ratios. First chronological age of the child was noted, and then a scale was kept vertically at the point corresponding to the chronological age of the child in months given horizontally in the X axis. All the items [shown in the blocks] completed fully to the left side of the scale were expected to be done by the child. If not attained by the child for that age, that item delay will be assumed for the child. The interpretation is done in four ways as in table 1.

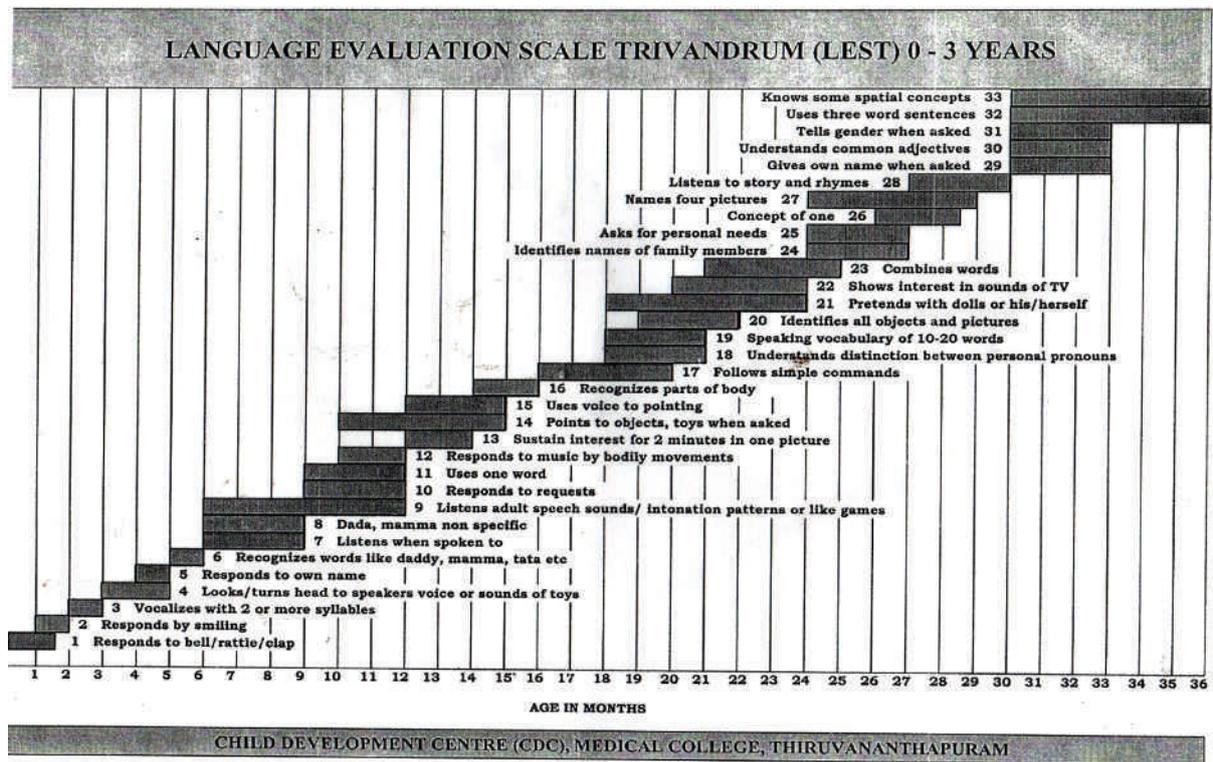
Normal-All items done	Suspect-Two items not done
Questionable-one item not done	Delay - Three or more items not done

Table 1 - Interpretation of language delay using LEST

The data collected was then analyzed by using chi square test, to find out the association between the language delay and other factors like socio demographic factors, birth related factors, home environment and p value was calculated. P value below or equal to 0.05 was considered to be statistically significant for a 95% confidence interval.

The prevalence of speech and language delay was calculated as normal, questionable, suspect and delay which was the outcome variables. Each item was compared with the sociodemographic profile and home environment. The results were represented as tables and graphs. The statistical software SPSS was used for the analysis of the data and Microsoft excel was used to generate tables.

Results and discussion : Of the 200 children screened for language delay, 62% of the babies were below the age of 24 months, 52.5% of them were girl babies, 80.5% of them were first child in their family, 23.5% of the babies were with the birth weight of less than 2500gms. Most of them hailed from upper



MKC Nair, GS Harikumar Nair, AO Mini, S Indulekha, S Letha, PS Russell, Babu George. Development and Validation of Language Evaluation Scale Trivandrum for Children aged 0 – 3 years - LEST (0-3). Indian Pediatr 2013; 50 (5): 463-467.

Fig 1 - LEST Scale

socio economic status and upper middle class. 89.5% of them were residing in urban area. Regarding the type of family 74% of them were nuclear. 57% had normal language development, 18.5% had questionable delay, 18% suspectable delay and 6.5 % had total delay[table 2].70% the children in the age group of 7 to 12 months are slightly having higher prevalence of language delaythan other age group children [table 3].There was no association between the sex and language development of the child. The birth order of the child and its association with language development indicates more delay occurs among the first order child compares to others. There was no association between the birth weight and language development of the child.

LEST DELAY scale	Interpretation	No	Percentage %
0	No delay	114	57.0
1 item delay	Questionable delay	37	18.5
2 item delay	Suspect delay	36	18.0
3 item delay	Total delay	12	6.0
4 item delay	Total delay	1	.5

Table 2 - Distribution of language delay groups according to LEST .

There was no significant association between the language development of the child and age of the child's mother or her educational status. There was no significant association between the language development of the child and age of the child's father or his educational status. No association exists between

Prevalence of language delay and socio-economic status (table 4). No association exists between the place of residence of the child and their language development. No association exists between the type of family of the child and their language development. No association exists between the home environment of

	Variable	Language development				Chi-square test value	Degrees of Freedom	P-value
		Abnormal		Normal				
		No.	%	No.	%			
	Childs age							
A	0-6	4	20.0	16	80.0	11.585	5	0.041
B	7-12	25	59.5	17	40.5			
C	13-18	6	35.3	11	64.7			
D	19-24	23	50.0	23	50.0			
E	25-30	9	33.3	18	66.7			
F	31-36	19	39.6	29	60.4			

Table 3 - Association between the language development and age of the child

Variable	Language development				Chi-square test value	Degrees of Freedom	p-value
	Abnormal		Normal				
	No.	%	No.	%			
Socio-economic status							
26-29(Upper)	45	46.9	51	53.1	8.675	3	0.034
16-25(Upper Middle)	35	43.8	45	56.2			
11-15(Lower Middle)	3	15.0	17	85.0			
5-10 (Upper Lower)	3	75.0	1	25.0			
<=5 (Lower)							

Table 4 - Association Between the Language Development and Socio Economic Status of the Child's Family

Variable	Language development				Chi-square test value	Degrees of Freedom	p-value
	Abnormal		Normal				
	No.	%	No.	%			
Home Environment							
Poor	51	42.1	70	57.9	0.091	1	0.763
Good	35	44.3	44	55.7			

Table 5 - Association Between the Language Development and Home Environment

the child and their language development [table 5]. No association exists between the delivery details and the language delay of the child.

Discussion

Out of 200 children screened using LEST scale 57% had normal language development, 18.5% had questionable delay, 18% suspectable delay and 6.5% had total delay. Abraham et al showed that prevalence of language delay was 13.7%²⁷. MKC Nair study from Child development centre Trivandrum, showed approximately prevalence of 4.5% language delay⁴. Shiji Jacob showed that prevalence of language delay of 5.5%²⁸. Children in the age group of 7 to 12 months are slightly having higher prevalence of language delay [60%] than other age group children. According to Abraham et al, most of the delay [26.7%] was seen in 2-3 years age group²⁷. In MKC Nair study, language delay was observed for the age group 0-12 months⁴. There was no association between sex and language development of the child in our study, Abraham et al in his study also showed that no association exists between sex and language development of the child²⁷. But Shiji Jacob in his study showed Of the 25 children who had delay 15 (60%) were males²⁸. There is strong hazardous association between sex and speech delay.

In our study 80% of them with delay were first born as in Abraham et al study that showed Language Delay to be more prevalent among the first born child²⁸.

There was no association between the Language development of the child and mother's age in our study. Abraham et al study also showed no association with the parental age and language delay²⁷.

There was no significant association between the prevalence of language delay and socioeconomic status in our study. In Abraham et al study also no significant association was seen with lower or higher socioeconomic class and language delay.

Conclusion

Delay in speech and language development is the most common developmental disorder in children. Awareness of the delay is important for early identification and appropriate intervention. So using this simple tool LEST scale, we can identify those children with delays in language development and intervene early to prevent further consequences and abnormalities.

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