

Study of Factors Attributing To Language and Speech Delay for Early Detection and Intervention in High Risk Children

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Abstract: Speech and language is the most effective form of communication and its delay is a major problem affecting 5-8% of children without any neonatal risk factors. Children with communication difficulties frequently exhibit social and behavioural problems and poor academic performance in school. Also evidences have shown that intervention started during infancy or preschool age has a great positive effect than services provided at school age. Hence there is an obvious need to detect risk factors like maternal and social factors attributing to any delay in speech and language thereby helping to plan early intervention. We have conducted a cross-sectional study among 400 children of 0-6 years age group attending well baby clinic and daily paediatric clinic of the department of paediatrics, in AVMC&H and language assessment was done by using screening tool, LEST and its association with various factors. Our study revealed statistically significant association with gestational age at birth ($p<0.05$), and children living with the type of family ($p<0.05$). No correlation was found with maternal education & occupation and socioeconomic status.

Keywords: LEST Language Evaluation Scale Trivandrum, gestational age, maternal education and occupation, socioeconomic status.

I. Introduction

Speech is the most efficient and frequently used mode of language expression. Language constitutes 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 and art.¹

Delay in language and speech is a cause of concern for the parents as well as for the paediatricians affecting 5-8% of children without any neonatal risk factors.²⁻⁴ Children with language problems frequently exhibit social and behavioral disorders⁵⁻⁹ and are at risk of poor academic achievements in school age.¹⁰ Increasing number of evidences have shown that intervention started during infancy or preschool age has a great positive effect than services provided at school age.¹¹⁻¹³ Hence there is an obvious need for early detection and intervention of communication delay among children at risk.

Our study involves consideration of various maternal and social factors like maternal educational and occupational status, gestational age at birth, children living with the type of family and socioeconomic status that influence language and speech development thereby helping to predict the children at risk so that early intervention can be started.

II. Aims and Objectives

To assess the correlation of maternal and social factors with language and speech delay among the study population for early detection and intervention in high risk children.

III. Material and Methods

This was a cross-sectional study carried out in Aarupadai Veedu Medical college, Puducherry among 400 children of age group 0-6 years with no neonatal risk factors during the period, July 2012 to July 2014. Those children with severe sickness or developmental delay in other domains like gross motor, fine motor and social were excluded from the study group. The demographic profile and relevant information of individual patient was collected by using structured proforma by interviewing the mother and an informed consent was obtained. Socioeconomic status was assessed by modified Kuppaswamy's scale.

The language and speech assessment was done using LEST, an efficient screening tool, developed by Child development centre, Trivandrum, which can be used both by professionals, those who are working in the field of child development and even by mothers to pick up speech delay in the early years of life. The assessment of language delay was done by assessing if the child was able to do all the items on the left side of their corresponding age in the LEST chart. The interpretation was done in 2 ways : 1. Normal – All items done

and 2. Delay – Two or more items not done. Chi-square with p value of 0.05 was considered significant. The study attained clearance from the institutional ethical committee.

IV. Results

The prevalence of language and speech delay in our study population is 9.5% [table no.I].

Table No.I : Prevalence of Language and Speech delay

Result	No. of Child	Percentage
No delay	362	90.5
LEST positive (delay)	38	9.5
Total	400	100

i. Association of Language and speech delay with Maternal education

Table No.II: Maternal education and language delay

Maternal education	Result		Total No [%]	p-value (Chi-Square Test)
	No Delay No	LEST Positive[delay] No [%]		
10 th fail	259	29 [10.06]	288 [72]	0.177
10 th pass	73	9 [10.97]	82 [20.5]	
Degree	30	0	30 [7.5]	
Total	362	38	400	

There was language delay of 10.06% among children of mothers with 10th fail when compared to 10.97% among those of with 10th pass. The association between maternal education and language delay was not found to be statistically significant as P value was 0.177 (P value >0.05).

ii. Association of language and speech delay with Maternal occupation

Table No.III : Maternal occupation and language delay

Maternal occupation	Result		Total No [%]	p-value (Chi-Square Tests)
	No Delay No	LEST Positive [delay] No [%]		
House wife	308	32 [9.4]	340 [85]	0.886
working	54	6 [10]	60 [15]	
Total	362	38	400	

It has been found that among the children of house wife mothers, 9.4% had language delay when compared to 10% among those of working mothers. The association between maternal occupation and language delay was not found to be statistically significant as P value was 0.886 (P value >0.05).

iii. Association of language and speech delay with Gestational age at birth

Table No.IV : Gestational age at birth and language delay

Gestational age at birth	Result		Total No [%]	p-value (Chi-Square Tests)
	No Delay	LEST Positive [delay] No [%]		
Term	301	23 [7.09]	324 [81]	0.001
Pre Term	61	15 [19.73]	76 [19]	
Total	362	38	400	

The prevalence of language delay among children born at preterm was 19.73% when compared to 7.09% among those born at term. Hence the association between gestational age of the children at birth and language delay was found to be highly significant statistically as P value was 0.001 (P value <0.05).

v. Association of language and speech delay with children living with the type of family

Table No. V: Children living with the type of family and language delay

Type of family	Result		Total No [%]	p-value (Chi-Square Tests)
	No Delay	LEST Positive [delay] No [%]		
Joint family	85	5 [5.5]	90 [22.5]	0.025
Nuclear family	270	30 [10]	300 [75]	
Single parent	7	3 [30]	10 [2.5]	
Total	362	38	400	

The prevalence of language delay among children living with single parent was 30% when compared to 10% among those living with nuclear family and 5.5% among those with joint family. Hence the association between children living with type of family and language delay was found to be statistically significant as P value was 0.025 (P value <0.05).

vi. Association of language and speech delay with Socioeconomic status

Table No.VI : Socioeconomic Class and Language Delay

Socio economic class	Result		Total No [%]	p-value (Chi-Square Tests)
	No Delay	LEST Positive [delay] No [%]		
Class 1	0	0	0	0.062
Class 2	0	0	0	
Class 3	31	0	31 [7.7]	
Class 4	236	23 [8.8]	259 [64.75]	
Class 5	95	15 [13.63]	110 [27.5]	
Total	362	38	400	

In this study group, none belonged to class 1 and 2. The prevalence of language delay was 0 among children of class 3, 8.8% among those of class 4 and 13.63% among those of class 5. The association between socioeconomic class and language delay was not found to be statistically significant as P value was 0.062 (P value >0.05).

V. Discussion

Speech and language development is considered by experts to be a useful indicator of a child’s overall development and cognitive ability¹⁴ and is related to school success¹². Hence it becomes necessary to identify risk factors attributing to language delay for early detection and intervention in children at risk.

In our study population, majority (72%) of mothers had not passed 10th class with prevalence of language delay of 10.06% among their children when compared to 10.97% among those of 10th pass. Thus the association between maternal education and language delay was not found to be statistically significant as p value was 0.177 (p value >0.05) as against the studies done by Campell et al¹⁵, Nelson et al¹⁶ and Horwitz et al¹⁷ on “Review of risk factors and language outcomes” showing statistically significant association between lower maternal education and language delay. Similarly majority (85%) of the mothers were housewives with the prevalence of language delay of 9.4% when compared to 10% among those of working mothers. Hence the association between maternal occupation and language delay was not found to be statistically significant as P value was 0.886 (P value >0.05). This was supported by study on “Maternal working conditions and children’s verbal facility” done by Toby L.Parcel and Elizabeth G.Menaghan.¹⁸ Gestational age of the children at birth was analyzed. Majority (81%) of children were term and the prevalence of language delay was found to be 7.09% when compared to 19.73% among preterm children. The association between gestational age of the children at birth and language delay was found to be highly significant statistically as P value was 0.001 (P value <0.05). This was also supported by studies done by Ribeiro et al¹⁹ and Foster-Cohen S et al²⁰ on “Language development in preterm children”

The correlation between the type of family that the children were living with and language development was assessed. It was found that the prevalence of language delay among children living with single parent was significantly high (30%) when compared to 10% among those with nuclear family and 5.5% among those with joint family. Hence the association between children living with the type of family and language delay was found to be statistically significant as P value was 0.025 (P value <0.05). This was supported by study done by M frisk et al²¹ on “Developmental delay and other psychiatry disorders in children and adolescents”. The socioeconomic class grading was done by using Modified Kuppuswamy’s scale and majority (64.7%) of children belonged to class 4 with prevalence of language delay of 8.8% and class 5 (27.5%) with that of 13.63%. The association between socioeconomic class and language delay was not found to be statistically significant as P value was 0.062 (P value >0.05). It may tend to increase if sample size increased. This was against the studies done by Singer et al²² on “Familial aggregation in specific language impairment” and Horwitz et al¹⁷ and Hoff¹⁷ (2003) on “Risk factors and language outcomes” which showed significant association between language delay and lower socioeconomic status.

VI. Limitations Of The Present Study

Study involved only healthy children with no neonatal risk factors therefore it cannot be generalized to whole paediatric population.

VII. Summary

- The study group consisted of 400 children 0-6 years age group with no neonatal risk factors or developmental delay in other domains, attending well baby clinic and daily paediatric clinic at AVMC Hospital, Puducherry.
- Language assessment was done in these children in association with maternal and social factors using screening tool, Language Evaluation Scale Trivandrum (LEST)
- Prevalence of language and speech delay in our study population is 9.5%.
- There is statistically significant association between language delay and factors like gestational age at birth and children living with the type of family ($p < 0.05$).
- Statistically no significant association is found between language delay and factors like maternal education and occupation and socioeconomic status.

VIII. Conclusion

Language and speech delay occurs in 5 – 8% of children with no neonatal risk factors or developmental delay in other domains and thus is the cause of concern for parents. Ignorance on the part of parents may result in late reporting to the hospital resulting in delayed intervention there by leading to complications like social and behavioral disorders. The language assessment should be done in all children during follow up in well baby clinic, in association with the risk factors like preterm birth, those living with single parent and low socioeconomic status, to detect language delay earlier so that timely intervention can be planned thus preventing complications in future.

References

- [1]. Elizabeth B Hurlock. Child Development, 6th Edition. Tata McGraw Hill Publishers, Noida, 1942.
- [2]. Tomblin J.B., Records N.L., Buckwalter P., et al: Prevalence of specific language impairment in kindergarten children. *J Speech Lang Hear Res*, 1997;40: 1245-1260.
- [3]. Law J, Boyle J, Harris F, Harkness A, Nye C. Screening for primary speech and language delay: a systematic review of the literature. *Int J Lang Commun Disord*. 1998;33(suppl):21–23.
- [4]. G Spiel, E Brunner, Ballmayer and A Pletz. Developmental language and speech disability. *Indian Journal of Pediatrics*, 2001 September; Vol 68 : page 873-880.
- [5]. Prizant B et al. Communication disorders and emotional /behavioural disorders in children. *Journal of Speech and Hearing Disorders*. 1990;55:179-92.
- [6]. Owens R. Language disorders : A functional approach to assessment and intervention, 3rd Edition; Allyn and Bacon, 1999.
- [7]. Beitchman J.H., Nair R., Clegg M., et al: Prevalence of psychiatric disorders in children with speech and language disorders. *J Am Acad Child Adolesc Psychiatry* 1986; 25: 528-535.
- [8]. Cantwell D.P., Baker L.: *Psychiatric and developmental disorders in children with communication disorders*. American Psychiatric Press Washington, DC 1991.
- [9]. Beitchman J.H., Hood J., Rochon J., et al: Empirical classification of speech/language impairment in children: II. Behavioral characteristics. *J Am Acad Child Adolesc Psychiatry* 1989;28: 118-123.
- [10]. Catts H.W.: The relationship between speech-language impairments and reading disabilities. *J Speech Hear Res* 1993;36: Page 948-958.
- [11]. Barnett W, Escobar C. Economic costs and benefits of early intervention. In SJ Meisels & J P Shoukoff (Eds). *Hand book of early childhood Intervention*; 1990; 560-582.
- [12]. Catts HW, Fey ME, Tomblin JB, Zhang X. A longitudinal investigation of reading outcomes in children with language impairments. *J Speech Lang Hear Res*. 2002;45:1142–1157.
- [13]. Schuster MA. Developmental screening. In: McGlynn EA, ed. *Quality of Care for Children and Adolescents: A Review of Selected Clinical Conditions and Quality Indicators*. Santa Monica, CA: RAND; 2000; page 157–168.
- [14]. Mark D Simms, Robert L Schum. Language Development and Communication Disorders. *Nelson Textbook of Pediatrics*. 18th Edition Volume 1. Philadelphia: Saunders, 2007; Chapter 32.2: page 151-53.
- [15]. Campbell TF, Dollaghan CA, Rockette HE, et al. Risk factors for speech delay of unknown origin in 3-year-old children. *Child Dev*. 2003;74:346–357.
- [16]. Nelson H D , Peggy Nygrien, Miranda Walker, Rita Panoscha. Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. *Pediatrics*. 2006 February; Vol 117 No 2: page 303-305.
- [17]. Vera v Hawa et al, Toddler with delayed expressive language. An overview of the characteristics, risk factors and language outcomes. Review article, research in developmental disabilities 35 (2014) 400-407.
- [18]. Toby L.Parcel and Elizabeth G.Menaghan. Maternal working conditions and children’s verbal facility; social psychology quarterly, Vol.53, No.2 (Jun,1990), pp132-147.
- [19]. Ribeiro et al, *BMC pediatrics* 2011, 11:59. Research article, Attention problems and language development in preterm children: cross lagged relations from 18-36 months.
- [20]. Foster-Cohen S et al 2007 , August 24 (3) : 665-75 “Early delayed language development in very preterm infants: evidence from the Mac Arthur Bater CDI.
- [21]. M Frisk et al, *European child and adolescent psychiatry* 8:222 (1999). A complex background in children and adolescents with psychiatry disorders. Developmental delay, dyslexia, hereditary slow cognitive processing and adverse social factors in a multi factorial entirety.
- [22]. Tallal P, Ross R, Curtiss S. Familial aggregation in specific language impairment. *J Speech Hear Disord*. 1989;54:167–173.