



EFFECT OF GESTATIONAL AGE ON CHILD'S EARLY SPEECH AND LANGUAGE DEVELOPMENT

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ABSTRACT

Background: Language development in toddlerhood forms the foundation for speech and language comprehension throughout childhood. Language skills of Children who are born preterm perform worse than children who are born full term. This pattern of findings is evident across a range of outcomes spanning vocabulary size and quality of word use, as well as morphological and syntactic complexity. **Methods:** The study consisted of forty typically-developing Kannada speaking children between 4 and 5 years of age. They were classified into 2 groups (Group 1: premature, Group 2: full term). Vocabulary (semantics) was assessed using Picture vocabulary test and speech samples were collected to assess their (syntactic skills) MLU. The statistical analysis was carried out using SSPS 18.0 version. Mean scores and standard deviations were obtained for both vocabulary and Mean Length of Utterance (MLU). MLU and vocabulary was compared between preterm and term children. **Result:** The results indicated a significant difference ($p < 0.05$) between both the groups for both semantic and syntactic measures. The findings demonstrate the presence of pervasive delays in the early language development of children born very preterm. **Conclusion:** It also highlights the importance of gestational age in predicting later language risk in this population of infants.

KEYWORDS : Preterm, Vocabulary, Mean Length of Utterance (MLU).

INTRODUCTION

Communication refers to the sending and receiving of messages, information, ideas, or feelings. [1] It is a broad term which includes the physical production of speech, symbolic nature of language and any behavior or action that conveys a message. The most important period for acquiring speech and language skills is the first 3 years of life, in which there is rapid development and maturation of the brain termed the critical period. These skills develop best when the child is exposed to the consistent language of others. Language acquisition becomes difficult when a critical period of time passes without adequate stimulation.

Parents and other family members act as a model for appropriate usage of communication in society. In their interactions with peers, children get the chance to learn about unique conversational roles. Throughout their school years, children continue to build their vocabulary and also begin to learn abstract words. Between the ages of 3 to 5 years, word learning takes place through conversation and reading. Exposure to good quantitative and qualitative communication at home facilitates rapid growth of a child's vocabulary.

The Committee on the Fetus and Newborn of the American Academy of Pediatrics (2004) defines gestational age (or menstrual age) as the time between the first day of the last normal menstrual period and the delivery day). Full-term birth is defined as occurring within 37 and 42 weeks of gestational age, whereas preterm birth is considered before 37 weeks. [2] It is observed that preterm infants are at greater risk of developmental deficits than full-term infants, as the chances of preterm infants presenting disabilities in cognitive and attention development and self-regulation are higher. These issues tend to continue throughout childhood, having been associated with learning and attention disabilities and behavioral problems. [3]

Need For The Study

There is a paucity of research data in India illustrating a correlation between a child's speech and language development and gestational age. Further comprehensive studies are needed to understand this relationship in an

Indian setting, which in turn could contribute to early diagnosis and counseling of children with speech and language disorders

AIM OF THE STUDY

The aim of the study is to evaluate how gestational age of a child contributes to language development.

REVIEW OF LITERATURE

Preterm births are common worldwide and show no signs of decline. Infants born prematurely are at higher risk for a number of complications that can affect their cognitive, emotional, and language performance well into their teenage and adult years. Research on preterm birth is complicated by a number of methodological difficulties and is still largely based on data collected decades ago, when medical procedures in neonatal units were different.

Schuymer et.al [4] highlighted the risk of a less favorable pre-verbal development in preterm children, confirming that the conditions at birth partially influence the development of language through preverbal skills, which is important for clinical practice.

Luoma, et.al [5] assessed speech and language comprehension and production at the age of 5 years in a cohort of children born preterm at <32 weeks' gestational age (N=55) in comparison with children born at term and of similar age, sex, and social backgrounds. Mean performance for the entire group of preterm children was significantly lower than for the controls on most of the measures including the composite IQ scores. In addition, difficulties in comprehending relative concepts were typical for the preterm children.

Another study done by Sperotto, R [6] found that infants born preterm showed a delay in language abilities at 18 and 24 months and gestational age correlated positively with both receptive and expressive vocabulary size at both ages.

In studies comparing preterm and term infants, there was evidence that preterm infants performed worse on indicators

of language. [7]

METHOD

The participants in this study were typically developing children who speak Kannada as their first language. The participants were divided into two groups containing 20 children each, grouped on the basis of their gestational age within the age range of 4 to 5 years.

- Group 1-** children who were born preterm
- Group 2-** children who were born full-term

A cross-sectional design along with a non-probability sampling procedure was employed in order to assess the language abilities across different age groups. The study was conducted in the Dakshina Kannada district, in the state of Karnataka, India between October to November 2022. Ethical approval was obtained from the Institutional Ethics Board before the commencement of the study.

Inclusionary Criteria:

- Age-appropriate speech and language skills (as per Receptive Expressive Emergent Language Scale)
- The child should attend either an anganwadi or a play school from the age of 3.5 years or 4 years
- Children who have Kannada as their first language

Exclusion Criteria

- Children with any developmental delay, or other associated problems.
- Children who have Auditory and visual deficits

The children were selected from urban schools (kindergarten, play school, and private pre-primary schools). Participants were evaluated after a questionnaire interview to determine gestational age, which was validated by three experienced speech language pathologists. Prior to testing, a standard consent form was read and signed by each parent of the child.

Preparation Of The Test

A picture vocabulary test was developed using the Kannada textbooks recommended by the Karnataka State Board. This test material has been validated by 3 Kannada teachers and 3 speech pathologists. The material consisted of 30 picture cards with 4 pictures each. All pictures were line diagrams.

Administration Of The Test

The children were tested in their respective school facilities in a quiet room and they were asked to sit comfortably on a chair. Before the administration of testing, a rapport was built with the child in the presence of the class teacher. After a relationship was established, the test was administered to each child individually, in single sessions of 45 minutes, with subjects receiving no clues about the test before it began.

The children were each shown a series of pictures from the picture vocabulary test, and the examiner named a word for the corresponding target picture; the child was expected to point to the picture for that particular word, as told by the examiner. All 30 target words for 30 pictures were predetermined by the examiner and all children were asked to point to the same target pictures for these 30 target words. General conversation was carried out with all the children to elicit open ended responses to assess MLU.

Scoring And Analysis

The testing involved assessing two language skills: semantics (vocabulary) and syntax (MLU). Vocabulary of the child was scored during the testing and noted down immediately after getting the response of the child. A score of "1" was given for every correct response and a score of "0" for incorrect response. Total score of the picture vocabulary test was 30.

All video recordings of children's open-ended answers were

used to assess their MLU. MLU was calculated using the formula:

$$\frac{\text{Total number of morphemes}}{\text{Total number of utterances}}$$

The statistical analysis was carried out using SPSS 18.0 version. Mean scores and standard deviations were obtained for both vocabulary and MLU. MLU and vocabulary was compared between preterm and term children. T-test was used to find the difference between both the groups.

RESULTS

Figure 1: Comparison of MLU Scores of term and preterm children

Gestational age	Mean MLU Score	Std. Deviation	"t"	P value
Preterm	3.89	0.867	-6.091	<0.001
term	5.39	0.583		

As seen in present study mean MLU scores of term children were 5.39 and was found to be comparatively better than children born preterm 3.89 (fig.1). This clearly indicates that children with term gestational period had better MLU when compared to children with preterm gestational period. This finding was statistically significant, (p<0.001). This can be supported by the study done by Loe IM [8] who have suggested that, preterm children present poor language performing functions.

Figure 2: Comparison of vocabulary Scores of term and preterm children

Gestational age	Mean vocabulary Score	Std. Deviation	"t"	P value
Preterm	23.67	3.804	-3.460	0.002
term	27.22	2.130		

As seen in the present study, children born with term gestational period had better vocabulary scores of 27.22 than those born preterm with scores of 23.67(fig.2).

This clearly indicates that children with term gestational period had better vocabulary when compared to children with preterm gestational period. This finding was statistically significant, (p<0.001).This finding can be supported by the study done by Guedes ZCF, [9]. They suggested that deficits observed in preterm children are smaller vocabulary, delay in language acquisition, less complex language, difficulties in phonological processing and short-term memory.

DISCUSSION

Prematurity, and the aspects related to it can negatively influence language acquisition. The current study indicate that prematurity is a risk factor that may affect the maturation process of the central auditory system. Language acquisition during the first year of life depends on the appropriate maturation of the central auditory pathway because formation of linguistic representations by the environment is strongly conditioned by the brain and factors related to the maturation. It was also observed that delay in these children's language development, impairments in phonetic and phonological aspects, such as consonant inventory and syllabic complexity, may be related to preterm birth and aspects intrinsic to prematurity. Thus, it is important for clinical practice to monitor children exposed to risk factors, such as prematurity, in order to investigate and understand the development of auditory and linguistic abilities in them.

To conclude, multiple influencing factors may affect the development of language in children, and the identification of these is essential. This study throws light upon the influence of gestational age on the development of child's language, and brings out the differences between the two groups. Further research is required to ascertain whether a similar finding prevails in the larger population and in different regions of our country since many languages is spoken in India.

REFERENCES

1. Gordon-Brannan, M. E., & Weiss, C. E. (2007). Clinical management of articulatory and phonologic disorders. Lippincott Williams & Wilkins.
2. Formiga, C. K. M. R., & Linhares, M. B. M. (2009). Avaliação do desenvolvimento inicial de crianças nascidas pré-termo. *Revista da Escola de Enfermagem da USP*, 43, 472-480.
3. Lowe, J. R., Erickson, S. J., MacLean, P., Schrader, R., & Fuller, J. (2013). Association of maternal scaffolding to maternal education and cognition in toddlers born preterm and full term. *Acta paediatrica*, 102(1), 72-77
4. De Schuymer, L., De Groot, I., Beyers, W., Striano, T., & Roeyers, H. (2011). Preverbal skills as mediators for language outcome in preterm and full term children. *Early Human Development*, 87(4), 265-272.
5. Luoma, L. (1998). Speech and language development of children born at 32 weeks' gestation: a 5 year prospective follow up study. *Developmental Medicine & Child Neurology*, 40(6), 380-387.
6. Sperotto, R. (2016). The influence of gestational age on social attention and language in the second year of life (Doctoral dissertation, Cardiff University).
7. Zerbeto, A. B., Cortelo, F. M., & C Filho, É. B. (2015). Association between gestational age and birth weight on the language development of Brazilian children: a systematic review. *Jornal de Pediatria*, 91, 326-332.
8. Loe, I. M., Lee, E. S., Luna, B., & Feldman, H. M. (2012). Executive function skills are associated with reading and parent-rated child function in children born prematurely. *Early human development*, 88(2), 111-118.
9. Guedes, Z. C. F. (2008). A prematuridade e o desenvolvimento de linguagem. *Revista da Sociedade Brasileira de Fonoaudiologia*, 13, 97-98.