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Original Article

Artigo Original

Linguistic performance in 2 years old preterm, considering chronological age and corrected age

Desempenho linguístico de prematuros de 2 anos, considerando idade cronológica e idade corrigida

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Keywords

Child Language
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ABSTRACT

Introduction: Preterm birth causes problems that are not restricted to perinatal mortality. Some premature, even in the absence of brain damage, have negative effects on various aspects of development, such as language difficulties. **Objective:** This study aimed to verify the linguistic performance of preterm children at 2 years old, considering the chronological age and corrected age. **Methods:** The study included 23 preterm children and applied the Test of Early Language Development- TELD-3 to assess the language skills. **Results:** The premature children showed the linguistic performance alterations in Teld-3 in 39.13% of cases. They were also analyzed considering the delay to the chronological and corrected ages and there was no difference in performance for both receptive subtests (p = 0.250) and significant (p = 1.000). **Conclusion:** The group of premature children at 2 years is a population at risk for language disorders that cannot be compensated with age correction.

Descritores

Linguagem Infantil
Desenvolvimento de Linguagem
Transtornos do Desenvolvimento da Linguagem
Prematuro

RESUMO

Introdução: O nascimento prematuro acarreta problemas que não se restringem à mortalidade perinatal. Alguns prematuros, mesmo na ausência de lesões cerebrais, apresentam consequências negativas em diversos aspectos do desenvolvimento, como dificuldades em adquirir linguagem. **Objetivo:** O objetivo deste estudo foi verificar o desempenho linguístico de prematuros, na faixa etária de 2 anos, considerando a idade cronológica e a idade corrigida. **Métodos:** Participaram do estudo 23 sujeitos prematuros e para verificar as habilidades linguísticas foi aplicado o Test of Early Language Development – TELD-3. **Resultados:** Os sujeitos prematuros apresentaram desempenho total alterado no TELD-3 em 39,13% dos casos. Os prematuros também foram analisados considerando o atraso para a idade cronológica e a corrigida e não houve diferença no desempenho para os subtestes receptivo (p = 0,250) e expressivo (p = 1,000). **Conclusão:** O grupo de prematuros aos 2 anos de idade constitui população de risco para alterações de linguagem que não podem ser compensadas com a correção da idade.

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INTRODUCTION

Premature birth is the main cause of perinatal mortality worldwide[1,2]. The problems of prematurity are not restricted only to perinatal mortality, they also extend up to the difficulties in delivery care, the immediate care to the newborn, and to the risks of sequelae in various organs and systems[1].

The advances in obstetrics and neonatology have resulted in better survival rates among children of premature birth[3], despite the difficulty in the rates of development remaining high[4-6].

Some children that were born premature, in the absence of brain injuries, have negative consequences in several important aspects of development[7,8], such as difficulties in acquiring language[9-11], poor cognitive ability[9,12], and linguistic and academic difficulties within the early school years[4,13-17].

Premature children tend to present a lag in lexical development when compared with children born at term[18]. In receptive vocabulary tests, these children have lower mean score than that of the standardization of the applied test presented for the age[19].

The grammatical development also seems to be affected in premature birth[13] and these children present difficulties with complex functions of the language during their development[20].

Premature children usually have slower cognitive progress than their peers born at term[9,12].

Most premature children will need support for the many changes they might present[3] and despite the risks seen in the growth and development of premature children, many factors may compensate these risks, such as the early intervention and support from these children's families[21].

Most survivors of extremely low birth weight need a comprehensive and quality intervention and educational support during childhood[22,23].

This study is justified, as it will provide important information on the extension and kinds of linguistic deficit prevalent in the studied population. The identification of possible delays in linguistic development among premature children is necessary so that the professional team monitoring this population is able to perform an appropriate intervention, minimizing future deficits.

The objectives of this study were to verify the linguistic development of children with a history of prematurity and low weight at birth and at 2 years of age, and to compare the development considering the chronological and corrected age.

METHOD

This research was approved by the Ethics Committee for the Research Projects Analysis of the *Hospital das Clínicas* of the School of Medicine of the University of São Paulo under number 0719/11 and by the Research Ethics Committee of the School Hospital of the University of São Paulo under registration number 1240/12 – CAAE: 0713.0.015.000-11. Those responsible for the participants signed the informed consent.

The sample of the study consisted of children aged between 2 years and 2 years and 11 months, with a history of prematurity, who have follow-up monitoring at the clinics of two hospitals where they were prematurely born.

The subjects selected had absence of brain injury and/or any other pathology or alteration, which could justify a possible language alteration. The data of the births should include gestational age up to 36 weeks and birth weight under 2,500 g. They were invited to take part in the research at the day of their follow-up visits to the clinics. The children selected for the study did not have speech language rehabilitation before the study.

To carry out the study, we used a verification test for linguistic development: Test of Early Language Development – TELD-3[24] translated and adapted into Brazilian Portuguese – BP[25]. The TELD-3 is an early identification test for the alterations in the development process of the speech language of children aged between 2 years and 7 years and 11 months.

The adaptation of the TELD-3 into BP had results that allowed in stating that the performance of Brazilian children in the average development of language, in the referred study, is equivalent to the one of the original population (American) for the validation of the test, therefore, it being liable to be used without any other sociocultural or linguistic adaptation. The findings, after statistical analysis, indicated that the TELD-3 may be used as a measure of linguistic age of Brazilian children in language development. Thus, the Brazilian version of the test may be an excellent instrument not only for cross-cultural studies but also for verification, at the time of the diagnosis, of the deficit degree of the child, in case there is any, in addition to allowing the observation of the clinical evolution of children with communication disorders.

The test has two forms that, according to the authors, are equivalents (form A and form B). This research used only the form A of the test. The complete test kit consists of a set of toys, an album of pictures, and the protocol for the registration of the answers.

No national or international references were found related to the researches carried out with the TELD-3 among prematurely born children. Yet, the test was selected for performing this study, as it was an internationally known test, already translated, and adapted into BP.

After inclusion in the groups, the subjects were tested individually, in a silent and appropriate room of the clinic of premature follow-up. The application of the test was conducted in a single session of approximately 20 minutes.

For the TELD-3, the following procedures were conducted according to the application instructions in the guidebook of the test: the application of the test was always initiated by the receptive subtest and, later on, continued by the expressive subtest. For both subtests, the testing was initiated from the item indicated for the chronological age of the child, according to the registration protocol.

The first stage of the test consists of determining the *base*, which corresponds to correctly answering three items in the sequence. All items below the base will be considered as correct. The test is interrupted when the child makes mistakes in three items in the sequence determining the *top* and, therefore, all subsequent items will be considered as incorrect.

The answers of the subjects were registered in an appropriate and specific protocol. The child scores 1 point for each item of the subtest answered correctly and 0 (zero) points for each

item answered incorrectly. There are scoring criteria for each and every item (which should be performed or answered by the child to obtain the points).

The answers of the subjects were analyzed separately for each subtest and the score of the subtests generated a total score for the TELD-3. This way, the subjects had a specific score for the receptive subtest and expressive subtest, in addition to the one for the total of the test.

After adding up the correct answers obtained, conversions of the gross scores of the subtests were done, using the conversion table of the test itself to determine the ratio (matched by age).

RESULTS

After the procedures of testing and tabulation of the data, the descriptive and inferential statistical analysis was initially implemented to explore the linguistic performance of children born prematurely.

The objective of this analysis was to verify the linguistic performance of the premature children at 2 years of age and to compare the performance considering both the chronological and corrected age of the subjects.

The groups of premature children consisted of 23 subjects, aged between 2 years and 2 years and 11 months, mean age of 28.69 months, that is, 2 years and 4 months of age.

To analyze the linguistic performance in the test, categories were created as provided by the TELD-3 test. The performance ratios classified as average or superior were categorized as appropriate, and the ratios classified as below average or inferior were categorized as altered.

Chart 1 shows the classifications proposed by the test and the category used for the statistical analysis.

Table 1 presents the qualitative description of the group of subjects aged 2 years.

We found that the sample of the study consists of 47.82% of male subjects and 52.18% of female subjects. There was an altered total performance in 39.13% of the premature subjects aged 2 years by TELD-3.

To explore the data, the delay in months in the receptive and expressive subtests was considered, as the total ratio of the test does not provide information on the equivalent age. The differences between the equivalent age provided by the test, the chronological age of the child, and their corrected age were calculated.

Chart 1. Classification of the ratios provided by the TELD-3 and categories for the analysis

Ratios	Classification	Category
131-165	Very superior	Appropriate linguistic development
121-130	Superior	
111-120	Above average	
90-110	Average	
80-89	Below average	Altered linguistic development
70-79	Poor	
35-69	Very poor	

Table 2 presents the comparison of performance (with or without delay) considering the initial situation with the chronological age and, then, with the correction in the age.

The results indicated that there was no significant difference between the situation of delay considering the chronological and the corrected age of subjects in both subtests: the receptive and the expressive one.

DISCUSSION

Initially we found that 39.13% of the premature subjects had altered total performance by the TELD-3, which corroborates the many researches[9,11,18] pointing to premature birth as a risk for language difficulties.

The age range of 2 years in the premature subjects was selected to compose the research, as it offers the possibility of us studying an interesting aspect, when it comes to premature subjects, which is the correction of age. In clinical practice, it was used in discounting the gestational time that was not completed in the chronological gestational age.

In a study where premature subjects were tested with the Ages and Stages Questionnaire (ASQ), it was verified that the ideal age to identify language difficulties in premature children was 24 months[26]. This age is excellent for the reality of the services studied, as they correspond to the greater concentration of the population served.

Studies involving premature children and the development of the language have already been conducted considering the corrected age of the children[13,26-28].

Thus, we may question whether the delay in language development among premature children could correspond to this difference between the gestational age in which the child was born and the complete gestational time of 40 weeks.

Analyses were done to test the groups of 2-year-old premature children in two different situations: the existence of delay considering the linguistic age pointed out in the test and the chronological age of the subject and the existence of delay considering the linguistic age and the corrected age of the subjects. The results showed that there was no significant difference between the two situations.

Table 1. Qualitative description of the premature group (n = 23)

N			%
Gender	Male	11	47.82
	Female	12	52.17
Total performance in the TELD-3	Appropriate	14	60.86
	Altered	9	39.13

Table 2. Comparison of the performance in the Receptive and Expressive subtests of the TELD-3 considering chronological age and corrected age ($p < 0.05$)

	WITHOUT DELAY	WITH DELAY	P
RECEPTIVE DELAY	3 (13.0%)	20 (87.0%)	0.250
RECEPTIVE CORRECTED DELAY	6 (26.1%)	17 (73.9%)	
EXPRESSIVE DELAY	2 (8.7%)	21 (91.3%)	0.999
EXPRESSIVE CORRECTED DELAY	2 (8.7%)	21 (91.3%)	

Thus, we may observe that the delay in language development observed in 2-year-old premature children is not compensated by a correction of age. Therefore, in clinical practice, the results of this study should be considered in a way that premature children are always observed carefully regarding the risk of language alterations, as the correction of age does not compensate the occasionally presented alterations.

Although the results found are promising, one of the limitations of the study was the reduced number of subjects because of the shortage of suitable site for the conduction of the test; as it is a study carried out in high demand medical offices of premature follow-up monitoring, it reduces the space for concurrent activities.

Thus, as exposed, it is essential that children born premature are monitored for early identification of the ones who will eventually have language difficulties, as the early intervention in those cases may reduce or eliminate the impact of such deficits in the development of this population, as highlighted in several studies[22,23,29].

CONCLUSIONS

We verified that the 2-year-old premature subjects had altered total performance, configuring a risk population for language alterations. The correction of age for the 2-year-old premature does not compensate the delay, if present.

The follow-up of premature children is essential, to identify early the ones who will have difficulties in language, so that the intervention begins with reducing or eliminating these deficits in the development of this population.

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Author contributions

TIML was the author of the thesis which generated the article, responsible for the collection, tabulation, and analysis of the data and overall elaboration of the article; DMBL contributed with the elaboration of the project, oriented the thesis and elaboration of the article; EMAD contributed with the elaboration of the project; VLK contributed with the elaboration of the project; WBC contributed with the elaboration of the project.