Linguagem expressiva de crianças nascidas pré-termo e termo aos dois anos de idade*****

Expressive language of two year-old pre-term and full-term children

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Abstract

Background: expressive language of pre-term children. Aim: to compare the expressive vocabulary of two year-old children born prematurely, to that of those born at term. Methods: the study sample was composed by 118 speech-language assessment protocols, divided in two groups: the pre-term group (PTG) composed by 58 underweight premature children followed by a multi-professional team at the Casa do Prematuro (House of Premature Children) at Unifesp, and the full-term group (FTG) composed by 60 full-term born children. In order to evaluate the expressive language of these children, the Lave - Lista de Avaliação do Vocabulário Expressivo (Assessment List of the Expressive Vocabulary) was used. The Lave is an adaptation of the LDS - Language Development Survey - for the Brazilian Portuguese Language. The Lave investigates the expressive language and detects delays in oral language. Results: children born underweight and prematurely present a greater occurrence of expressive language delay, 27.6%. These pre-term children present significantly lower expressive vocabulary and phrasal extension than children of the same age born at full-term in all semantic categories. Family income proved to be positively associated to phrasal extension, as well as to gestational age and weight at birth; thus indicating the effect of these adverse conditions still during the third year of age. The audiological status was associated to word utterances in the PTG. Conclusion: children born prematurely and underweight are at risk in terms of vocabulary development; this determines the need for speech-therapy intervention programs.

Key Words: Premature Infant; Language Development Disorders; Language Tests.

Resumo

Tema: linguagem expressiva de crianças nascidas pré-termo. Objetivo: comparar a linguagem expressiva de crianças nascidas pré-termo com o de crianças nascidas a termo aos dois anos de vida. Método: a amostra foi composta por 118 protocolos de avaliação fonoaudiológica, divididos em dois grupos: 58 do grupo pré-termo (GPT) advindos do Programa Multidisciplinar da Casa do Prematuro - Unifesp; e 60 do grupo de termo (GT) do atendimento no serviço de puericultura. Para avaliação da linguagem expressiva foi utilizada a Lave - Lista de Avaliação do Vocabulário Expressivo, uma adaptação para o Português da LDS - Language Development Survey. A Lave tem como objetivo investigar a linguagem expressiva e detectar atrasos na emissão oral. Resultados: as crianças nascidas pré-termo e de baixo peso apresentam maior ocorrência de atraso na linguagem expressiva, 27,6%. Estas crianças nascidas pré-termo apresentam vocabulário expressivo significantemente menor que crianças nascidas a termo na mesma idade, em todas as categorias semânticas. A renda familiar demonstrou associação positiva à extensão frasal, assim como as condições de nascimento, idade gestacional e peso ao nascer, também associados ao número de palavras produzidas. O status audiológico esteve associado à produção de palavras no GPT. Conclusões: crianças nascidas prematuras de baixo peso estão em risco para o desenvolvimento do vocabulário, o que determina a necessidade de programas de intervenção fonoaudiológica.

Palavras-Chave: Prematuro; Transtornos do Desenvolvimento da Linguagem; Testes de Linguagem.

Introduction

Language disorders are a problem for individuals and society. From as individual point of view, they affect the academic life and reduce the number of schooling years and the possibility of professional insertion. As far as society, is concerned there is more expenditure with special education and a smaller working force.

Retrospective studies point to a strong association between adverse conditions at birth and learning problems[1,2], and prematurity is one of the most frequent risk conditions for the development of academic abilities[3].

Several authors, after evaluating the linguistic performance of low birth weight preterm children concluded that this group presented a significantly inferior performance in relation to term children and were at risk for the language development[4].

Bearing in mind that neonatal adverse conditions are associated to premature childbirth which in turn may lead to nervous system injury[5,6] and increase the vulnerability of the child for language problems; that emission delays can indicate the vulnerability of the child for academic problems, the first objective of this study was to compare the expressive vocabulary of 28 month old preterm and term children. The second objective was to study the frequency of delays in preterm children and to analyze the relationship between preterm expressive language and a) audiological diagnosis, b) adverse birth conditions, and c) circumstantial conditions.

Method

In accordance with ethical principles, this study was approved by the CEP -Committee of ethics in Research of the UNIFESP under number 0262/07.

This is a restrospective study of speech and language evaluations carried out by the authors of this study, who are part of a transdisciplinary team, which includes paediatricians, neurologists, physioterapists, psychologists, audiologist and speech and language pathologists, of the UNIFESP Program of Prematures Development Follow-up, and the Program of monitoring typical development.

Sample

The sample was composed of 118 protocols of speech and language evaluation, distributed in two groups: The preterm[7] group (PTG) consisted of 58 evaluation protocols, boys and girls, low birth-weight (less than 2000 gram) born at Hospital São

Paulo and Hospital Vila Maria - José Strópoli and seen regularly by the transdisciplinary team in the Follow up program - UNIFESP. The full term group (FTG) consisted of 60 evaluation protocols of speech and language of term boys and girls seen at the puericultura service of the Vila Mariana Health Center and in the Escola Paulistinha de Educação Infantil. The children who presented genetic syndromes, head and neck malformation and/or sensorial impairment were excluded from the sample.

Instrument

In order to evaluate the expressive language we used an adaptation to Portuguese of the LDS - Language Development Survey[9], the LAVE - List of Evaluation of the Expressive Vocabulary[8]. The evaluation consisted of investigative expressive language and detecting delays. LAVE is composed of a 307 high frequency word list divided in 14 semantic categories: food (CO), toys (BR), environment (AM), animals (AN), body parts (PC), places (LU), action (AC), house (CA), objects (OB), people (PE), clothes (RO), vehicles (VE), modification of the environment (MO) and others (OU).

The parent or caregiver reads the list of words and marks those produced by child.

LAVE still considers the length of utterance of child, i.e. the number of words per phrase, based on the examples given by parents and caregivers.

Rescorla (1989) considered as criteria of Language delay the production of less than 50 of the 307 words and not producing two word sentences by the age 2. These criteria have been supported by a number of studies with Brazilian typical children[10].

Procedures

In this study, parents or caregivers were request to identify the words used by their child from the LAVE list and to mention whether the child´s phrase was composed of at least two words. They were assisted by the speech pathologist in charge.

The preterm infants were also assessed audiologically, i.e., they were given a behavioural and a physiological test with sound stimuli.

All the children had presented oto-acoustic Emissions for transient stimulation (EOAT) in the neonatal period, while in neonatal intensive care units or by the age of 3 months. The criterion used to judge EOAT was presence of emission 3dB above

noise in 1000hz and 6dB above noise in 2000, 3000 and 4000Hz with 50% reproductibility and 70% probe stability.

The child´s response to sound, word stimuli, audiometry with visual reinforcement plus an assessment of middle ear conditions and quality of response enable us to classify the child as:

. normal (adequate response for age);
. delayed (response was incompatible with age at one or more stages of development and;
. or signs of auditory processing disorder11.

Analysis of the results

The analysis of the protocols took into consideration the following variables: gender, age of child at time of evaluation, family income and age and schooling of mother. In the study of PTG medical history we also considered birth weight, gestational age, neonatologist´s diagnosis and audiological diagnosis.

We then recorded the total number of words marked as being produced by child, the number of words in each semantic category and the number of words per phrase. We could therefore compare the results of the two groups of children and analyse associations between the already mentioned variables in the PTG.

The initial statistical analysis calculated the descriptive measures: mean, standard deviation (SD) and median. T test and ANOVA were used for numerical variables and Qui-square for categorical variables with 5% or 0,05 as level of significance, marked with (*).

Results

The groups were balanced for gender and age. The sample was composed of 63 boys and 55 girls. The boys represented 55,17% of the PTG and 51,67% of FTG.

There was no significant difference between the groups when age of mother was considered. However, the schooling of mother and family income were significantly smaller in PTG than in FTG (Table 1).

There was a significant difference between PTG an FTG as to the total number of words and as to the number of words per semantic categories. The most frequently used category was people and the least, places, in PTG and FTG. There was no significant difference between PTG and FTG as number of words per phrase (Table 2).

There was no difference between the total number of words and words per phrase by the two groups when the variable gender was considered.

The schooling of mothers of PTG did not influence total number of words (p=0,895) nor words per phrase (p=0,563). The average number of words produced by preterm children of mothers with higher schooling (> 11 years) was similar to those with less schooling (< or equal 3 years).

The higher the family income of PTG the greater the length of the utterance (p=0,008*).

In the PTG, the smaller the birth weight the fewer the total words (p=0,045*) and the fewer words per phrase (p=0,019*). Gestational age was associated to length utterance (p=0,016*).

There was no significant association between the conclusion based on LAVE and the audiological results (p=0,738). However infants with normal auditory results produced more words than the ones with abnormal results (p=0,004*).

TABLE 1. Descriptive measures of PTG and FTG, mean and standard deviation of age of child, age of mother, schooling of mother and family income.

	PTG		FTG		P values
	mean	SD	mean	SD	T test
Child age (years)	28,55	4,77	28,83	3,94	0,727
Mother age (years)	31,05	7,37	30,02	7,05	0,441
Schooling of mother (years)	7,34	3,55	9,28	3,66	0,005*
Family income (Reais)	566,25	369,52	1502,91	1895,56	<0,001*

TABLE 2: Descriptive measures: Total words on LAVE, per semantic category and per phrase.

| | PTG | | | FTG | | | P values |
	mean	SD	%	mean	SD	%	T test
Number of words	132,10	87,61	100	187,03	83,09	100	0,001*
Number of words per phrase	3,77	2,06	-	4,43	1,99	-	0,080
Semantic category							
Food	15,59	8,76	48,72	19,63	7,74	59,93	0,009*
Toys	3,38	2,92	30,73	4,82	3,21	43,82	0,012*
Environment	4,31	3,01	43,10	6,08	2,92	60,80	0,002*
Animals	7,69	6,68	36,62	10,75	6,64	51,19	0,014*
Body parts	11,41	6,64	54,33	14,33	6,20	68,24	0,015*
Places	2,38	2,61	26,44	3,67	2,79	40,78	0,011*
Action	22,09	15,76	43,31	32,47	14,91	63,67	<0,001*
House	14,89	11,61	46,56	20,38	10,14	63,69	0,007*
Objects	6,28	5,02	44,86	8,60	4,93	61,43	0,012*
People	8,10	3,10	57,86	10,45	3,36	74,64	<0,001*
Clothes	6,84	5,89	40,24	10,45	5,43	61,47	0,001*
Vehicles	4,34	3,36	43,40	6,25	3,17	62,50	0,002*
Modification of the environment	12,21	10,98	37,00	19,43	10,93	58,88	0,001*
Others	12,67	8,49	39,59	19,72	8,68	61,63	<0,001*

Discussion

Size of vocabulary and utterance length have been used to assess language development of children[12]. Studies have shown a positive relationship between language impairment and poor vocabulary[13]. Children with Specific Language Impairment fail in naming tasks shows their semantic impairment[14].

Therefore, tests that enable us to assess semantic aspects and identify language development delays in a sample and inexpressive fashion are welcome by speech pathologists [12], particularly those working with children at risk[15].

Our research found 27,6% of PTG with language delay which agrees with the belief that low birth weight preterm children are at risk for language impairment [16-18], in particular, semantic impairment[19].

We also found that regardless of the semantic class, the PTG produced a significantly smaller number of words than the FTG[20]. Despite the mentioned difference both groups, PTG and FTG, produced more words such as mummy, daddy, auntie, uncle, grandmother, man, girl, etc., belonging to "people" category and fewer words belong to "place" category, such as, school, hospital, park. This result shows that the pattern of semantic acquisition seems to be similar in both groups.

The fact that names of "people" were produced first and more often may be associated to their greater significance[21]. Naming places may not be very significant to a 2 year old.

Mean length of utterance is known to provide information about grammatical development[22] of full term and preterm children[23,24]. Our research did not find a significant difference between PTG and FTG regarding utterance length, possibly because putting words together would be in its initial stage, at age two. We did find a relationship between utterance length and family income and in the PTG between utterance length and birth weight and gestational age.

An analysis of the PTG showed that birth weight and gestational age are associated to size of vocabulary. This finding confirms the hypothesis that prematurity (gestational age< 37 weeks) compounded with low birth weight is a risk factor for development [25,26], in particular language development[27,28]. Some studies have shown association between language impairment and cognitive aspects[29].

The auditory condition of PTG was also associated to the size of vocabulary. The auditory development of low birth weight preterm infants has been considered delayed, specially in the first year[11]. During school years, impairment auditory ability is closely related to reading and writing difficulty.

Language impairment in youth and adulthood may have implications for academic and social insertion[30].

Conclusions

Low birth weight preterm children showed expressive language delay more often than full term children of same age. Low birth weight preterm children presented smaller vocabulary in all the semantic categories.

Auditory condition was significantly associated to size of vocabulary in PTG.

Gender, maternal age, maternal schooling and newborn classification were not significantly associated to size of vocabulary nor to length of utterance. However family income was significantly associated to length of utterance. Besides gestational age and birth weight were significantly associated to size vocabulary which shows the impact of birth conditions even at the end of the second year of life and the importance of preventive and remedial programmes.

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Linguagem expressiva de crianças nascidas pré-termo e termo aos dois anos de idade.

159