Original Article

Linguistic profile of children with language impairment

Perfil linguístico de crianças com alteração específica de linguagem

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ABSTRACT

Purpose: To characterize the linguistic profile of children with language impairment using the Brazilian version of Test of Early Language Development – 3rd edition (TELD-3), to compare chronological and linguistic ages, and to classify the severity of the case. **Methods:** The test was administered individually to 46 children diagnosed with language impairment aged between 2 years and 10 months and 7 years and 11 months, who were enrolled in weekly speech-language therapy. From the data obtained, we compared the mean chronological age and the mean equivalent linguistic age. The type of impairment was classified as mixed or purely expressive, and the severity degree was established. **Results:** The mixed impairment was the most frequent in children with language impairment, however the classification of severity indicated that the mild category was the most frequent both in reception and expression. Linguistic age was below chronological age in most subjects, in both subtests. The expressive language was more impaired, as verified by the lower mean equivalent linguistic age, and higher concentration of subjects with impairments classified as below average and more pronounced severity. **Conclusion:** Mixed impairments were predominant in this population, with greater impairment in language expression and mild severity. Moreover, the TELD-3 proved to be a useful instrument in the diagnostic process of these language impairments.

Keywords: Child language; Language tests; Language disorders; Speech, language and hearing sciences; Speech-language pathology

INTRODUCTION

The process of language acquisition and its development cannot be described in a single pattern because it is influenced by individual differences and also by environmental and social aspects[1]. Therefore, its assessment is complex and an impairment's diagnosis must be based on the absence of others factors.

Concerning to language impairment (LI), which is a primary language pathology, its diagnosis is based on exclusion (hearing loss, intellectual deficit, speech motor impairments, emotional disturbs and neurological damages) and inclusion criteria (low performance in formal and standardized tests which assess language and also in IQ tests). Two patterns of language impairment are possible: language delay (LD), which might be overcome without damage; or an specific language impairment (SLI), in which difficult lasts for whole life[2,3].

Language impairment persistence comprises a delay that affects language comprehension, production or both abilities, varying according to child development[4-6]. This case includes deviant phonological characteristics, restricted vocabulary, excessive use of gestures for communication, phonological working memory deficits, grammatical performance impaired, difficult on sentence or specific word interpretation, and difficult to maintain conversation's topic[7-12]. Therefore, this impairment affects academic learning, socialization and social behavior, and might culminate, for example, in problems in peer relation[13-15].

One remarkable characteristic in these cases is heterogeneity, which has motivated some proposals of a subdivision to classify them according to their language impairments, making them more homogeneous[1]. One of these proposals suggests three divisions: expressive impairment (involving phonologic programming deficit and developmental verbal dyspraxia); receptive and expressive impairment (involving phonologic/syntactic deficit and verbal auditory agnosia); and higher order processing disorders (involving Lexical deficit disorder and

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Conflict of interests: None

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Received: 2/14/2012; **Accepted:** 6/11/2012

semantic-pragmatic deficit disorder)[16]. Recently, available diagnosis guides classify language impairment as "purely expressive" or "mixed" (with receptive and expressive deficits)[17].

Language disorders' assessment and diagnosis intend to determine whether there is an impairment, understand its possible reason, identify impaired areas, observe linguistic behavior, assess receptive and expressive abilities, compare these abilities with normal patterns and define parameters for rehabilitation progress[1].

To identify language disorders it is also important to consider normal development variance, communicative context and the patterns used to compare a child's linguistic development. Frequently, chronological age is used as a reference pattern to compare language development, which means that when there is a gap between chronological and linguistic age there are signs of a language disorder[18].

In our country there is a lack of speech-language tests to assess and diagnose child language[19]. Although it is not sold in Brazil, as efficient tool for this purpose is the Test of Early Language Development (TELD-3). It is a protocol early identification of language development deficits which assess receptive and expressive abilities concerning semantic, syntactic and morphological aspects. It was designed for children from 2 years old to 7 years and 11 months old, and provides receptive and expressive linguistic measures. It also provides a spoken language measure, a combination of those measures, which is an indicator of general language abilities. For each of these measures seven classification are possible ranging between very superior to very poor[20].

The original version in American but due to its reliability it has resulted in adapted versions for other language as Spanish and Turkish. It is internationally administered by speech-language pathologists and psychologists to assess bilingual[21], SLI[22], stuttering[23] children and other language disorder. The version translated and validated to Brazilian Portuguese might be used for diagnostic purpose, to verify severity and to assess clinical progress of children with language disorder[24]. Nonetheless, nowadays its administration in Brazil is restricted to research purpose.

However, there has been no research about its reliability with Brazilian children with some language impairment. The main issue of this paper is to characterize the linguistic profile of children with language impairment using the Brazilian version of Test of Early Language Development – third edition (TELD-3). We also aim to compare chronological and linguistic ages and to classify the severity of the case.

METHODS

This research was approved by the Ethics Committee for the Analysis of Research Protocols of the Clinical Hospital of the School of Medicine of Universidade de São Paulo, under number 114/10. The term of free and informed consent were signed by parents or guardians.

Subjects

Forty-six children with language impairment, aged between 2 years and 10 months and 7 years and 11 months, took part in this research. They were being attended at a Laboratory of Language Development Disorders. Thirty-three (72%) subjects were male. Children were diagnosed when their audiological threshold were normal and their performance was below expected in at least two standardized language tests between the following: vocabulary, phonological and pragmatic test from ABFW [25] and mean length utterance[26].

Procedures

Subjects were individually assessed using the Brazilian translated version of TELD-3. For this research data from the first assessment with TELD-3 of each child were used, because when authorization was given there were children already in therapy. However, from this day on, when the child arrives to the service, she is assessed with it and she is reassessed annually.

After performance analysis and classification, children's chronological age and equivalent linguistic age were compared. Test performance was used to classify children according to their linguistic performance.

Posteriorly, degree of severity was defined based on number of standard deviation relative to average. It means that from each TELD-3 subtest's score performance was classified as: average (average performance), mild (below two standard deviation), mild-moderate (below three standard deviation), moderate (below four standard deviation) and severe (below five standard deviation)[27]. In the end, subjects were classified according to their linguistic impairment as "purely expressive" or "mixed".

Data analysis

To characterize and compare subjects' performance it was considered the frequency in each possible category. The comparison between chronological and linguistic age considered measures of dispersion and mean, and association between measures was conducted by Fisher's exact test. The significance level adopted was 5%.

RESULTS

Linguistic profile on TELD-3

Figure 1 indicates that receptive language ranged from "very poor" (19.6%) to "very superior" (2.2%); while expressive language ranged from "very poor" (43.5%) to "average" (10.9%). Spoken language performance ranged from "very poor" (37.0%) to "average" (17.4%).

Linguistic impairment analysis, according to DSM-4 and CID-10, showed that mixed impairment is the most frequent in this sample (Figure 2).

Comparison between chronological and linguistic ages

Descriptive analysis indicates that average chronological age was 5 years and 2 months, while the average age of receptive language was 4 years and 3 months and of expressive language was 3 years and 5 months (Table 1).

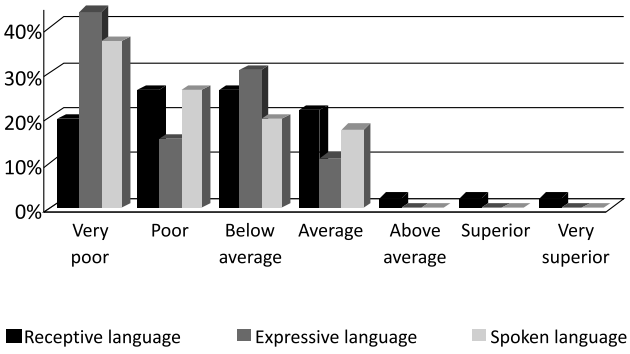

Figure 1. Performance of subjects according to TELD-3 classification

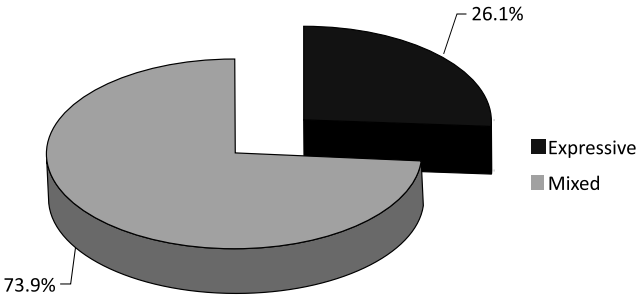

Figure 2. Performance of subjects according to linguistic impairment

The coefficient of variation (Table 1) points that receptive and expressive age varied more than chronological age (Figure 3).

Classification of profile severity

The classification of profile severity indicates that the most frequent category was mild for receptive and expressive language in this data. However, 26.1% subjects were classified as "average" on receptive language and only 8.7% had the same classification on expressive language (Figure 4).

DISCUSSION

The issue of this paper is to characterize the linguistic profile of children with language impairment, comparing chronological and linguistic ages and classifying its severity.

Concerning to test performance the majority of subjects showed expression and reception prejudice, which agree with previous studies[1,5,7,11]. The large range occurred in receptive language since some subjects' performance was normal while others' was severely impaired. Expressive language showed a lower range because none subject's performance was above average, confirming that this population prejudice is concentrate in this ability.

The range of spoken language performance indicated that all subjects had an impairment affecting their general language abilities, this fact reinforces literature's description about LI children low performance in formal and standardized language tests[2]. It is also important to mention that all subjects had low performances on expressive language, reflecting on low scores in spoken language average even for whose receptive one was normal.

Natural sequence of language abilities acquisition demands that before to be able to produce any linguistic unit one must understand its meaning. Thus, even if the LI child shows receptive language impaired, her expression will be much more impaired[3]. This fact confirms that in LI there is an generalized delay on linguist elements acquisition and/or expression[1], and also justifies the higher occurrence of mixed impairment in these subjects.

Concerning to age comparison, the vast majority of subjects

Table 1. Performance of subjects according to age (n=46)

Age	Minimum	Maximum	Mean	SD	Coefficent of variation (%)
Chronological age	2y10m	7y11m	5y2m	17.2	27
Receptive age	1y6m	8y3m	4y3m	24.2	47
Expressive age	1y6m	8y2m	3y5m	18.0	44

Note: SD = standard deviation; y = years; m = months

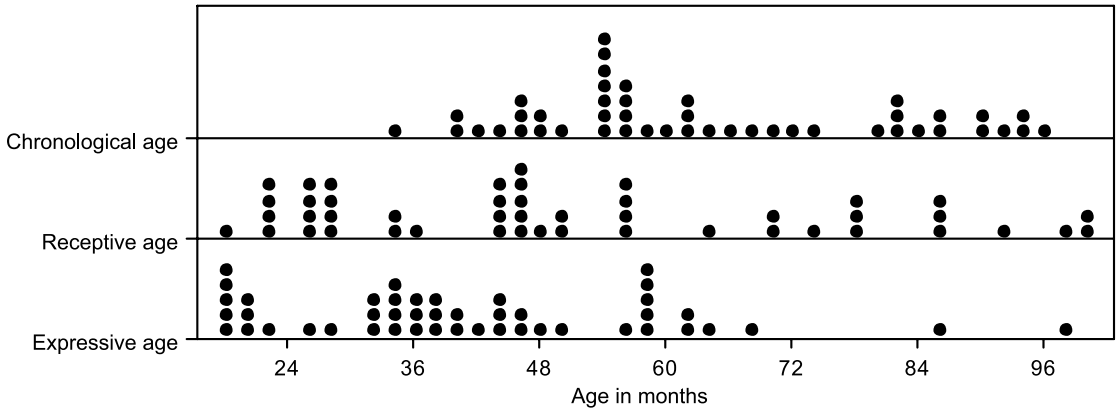

Figure 3. Subjects distribution by chronological and linguistic age (months)

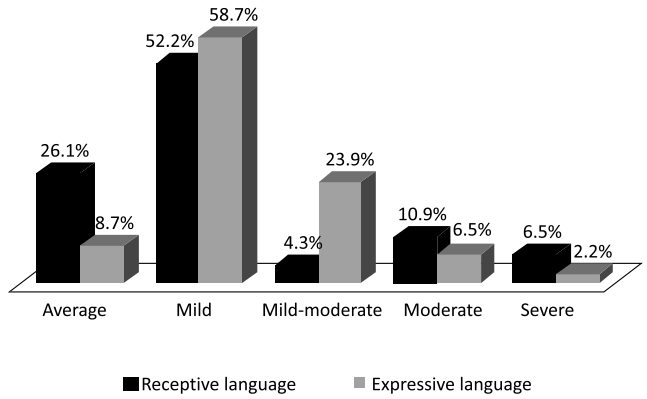

Figure 4. Subjects performance according to linguistic profile severity

showed equivalent linguistic age below chronological age, with expressive language below the receptive. So it is understandable that even with language improvement these children's evolution does not show a direct relation with age, even when they are in speech-language rehabilitation, confirming their difficult persistence[4,8].

For severity the majority of subjects showed a mild impairment both for expression and reception. More subjects had average performance on receptive language than on expressive, confirming their greater severity on expression[1,7]. This severity classification was really interesting because gives us the chance to monitor child's linguistic progress and also allows us since the diagnosis to confirm based on evidence how severe in the case.

This study has also allowed noticing the pathology's heterogeneity once impairment) show large performance variation between themselves both for reception and expression. It also was evidenced by obtained equivalent age, which agrees with literature when it affirms that difficult are persistent[4].

All in all, these findings contribute to characterize LI children's language and to reinforce that TELD-3 is an efficient assessment tool to diagnose language disorders. It might seem a simple contribution but it is essential for the language area in Speech-Language Pathology because it provides specific comparison parameters, including between other disorders, which affect child language. It also helps on diagnose process and rehabilitation monitoring[19,23]. As well it is essential that language tests are published in Brazilian Portuguese and become available to be bought, allowing rehabilitation progress to be monitored and compared between professionals.

Nevertheless, between this research limitations two must be discussed. The first one is about the fact that subjects were under speech-language therapy, what might have helped them. However, as mentioned before, to minimize this problem we opted to use data of the first assessment with TELD-3, so we had both subjects with varied intervention time and also those who were assessed when treatment started. Obviously, this fact might interfere in results, but whether we consider that children under longer rehabilitation time are whose language impairment is more severe, we are able to affirm that in those cases the therapy impact on linguistic abilities might have been minimized.

Another limitation concerns about the fact that it is a broad group, which probably includes both language delay and specific language impairment. Thereby, it is possible that severity was mild because we have worked with this hybrid group. However, once the diagnosis is only possible to be distinguished after age of 5 when linguistic impairment persists[28] and also considering that this was a first research our goal was to have a general view about this population language characteristics.

Therefore, it is important that other researches complement these findings, especially investigating linguistic differences on initial assessment of children younger and older than five years, which will allow verification whether TELD-3 detects a different pattern for language delay and for specific language impairment.

CONCLUSION

In this population the mixed cases were the most frequent, with greater impairment of expression and mild severity. Moreover, TELD-3 proved to be a useful tool in the diagnostic process of language impairments.

ACKNOWLEDGEMENT

This research was granted by Programa Institucional de Bolsas de Iniciação Científica (PIBIC), under process number 124685/2010-2.

RESUMO

Objetivo: Caracterizar o perfil linguístico de crianças com alteração específica de linguagem (AEL) utilizando a versão brasileira do *Test of Early Language Development – 3rd edition* (TELD-3); comparar as idades cronológica e linguística, e classificar a severidade do quadro. **Métodos:** O teste foi aplicado individualmente a 46 crianças com idades entre 2 anos e 10 meses e 7 anos e 11 meses, diagnosticadas com AEL, que estavam em atendimento fonoaudiológico semanal. A partir dos dados obtidos, foi realizada a comparação entre a média da idade cronológica e a média da idade linguística equivalente. O tipo de comprometimento foi classificado em misto ou puramente expressivo e o grau de severidade foi estabelecido. **Resultados:** O comprometimento misto foi o mais frequente nas crianças com AEL, porém a classificação da severidade indicou que a categoria leve foi a mais frequente, tanto na recepção quanto na expressão. A idade linguística esteve abaixo da idade cronológica na maioria dos sujeitos, em ambos os subtestes. A linguagem expressiva foi a mais prejudicada, visto que os sujeitos apresentaram menor média de idade linguística equivalente, além de ter havido maior concentração de sujeitos classificados com alteração abaixo da média e com gravidade mais acentuada. **Conclusão:** Nesta população predominam os quadros mistos, com maior prejuízo da expressão e cuja severidade é considerada leve. Além disso, o TELD-3 mostrou ser um instrumento útil no processo diagnóstico destas alterações de linguagem.

Descritores: Linguagem infantil; Testes de linguagem; Transtornos da linguagem; Fonoaudiologia; Patologia da fala e linguagem

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