

EVOLUTION OF THE SPEECH-LANGUAGE THERAPY IN A CASE REPORT OF SPECIFIC LANGUAGE IMPAIRMENT (SLI)

Evolução do processo terapêutico fonoaudiológico no distúrbio específico de linguagem (DEL): relato de caso

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ABSTRACT

The aim of this study was to describe the clinical course of a nine years girl diagnosed with SLI attended the Clinic of Child Language, FOB-USP. Longitudinal carried out was realized, through analysis of medical records and filming. The speech and language therapy began when the child was five years and presented the initial complaint of phonological alterations and impairments in the speech intelligibility. It was found phonological processes not expected for age, alterations in semantic, syntactic and pragmatic and in auditory perceptual processes. The receptive language was preserved. The intervention focused on the organization of linguistics subsystems, mainly the information processing skills. After 12 months, there was evolution of the aspects, except the phonological, with less significant evolution. Activities directed to written language were included when the child started primary school. After 42 months of intervention, there was evolution of phonological aspect. However, this evolution is not observed in spontaneous speech. Alterations in these aspects exert great influence on the performance of written language. The phonological awareness skill is adequate, however, there is difficulty in converting phoneme/grapheme, resulting in performance very short in written language. There is impairment in the linguistic information processing, and persisting alterations, common in the frames of SLI, which lead to gaps in the literacy process. To conduct the therapeutic process is necessary to understand the nature of language difficulties, developing specific strategies geared mainly to linguistic information processing and learning, providing skills and empowering the individual to active participation in school and social settings.

KEYWORDS: Child Language; Speech Language and Hearing Sciences; Clinical Evolution

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■ INTRODUCTION

The Specific Language Impairment (SLI) is an alteration which affects language development in the absence of sensory, motor, and intellectual deficit, pervasive developmental disorders, sensory deprivation or evident brain injury¹. This condition is characterized by the persistence of the great range of alterations it may show. It may affect varied language aspects (phonological, syntactic, semantic and pragmatic) to a lower or greater degree in both receptive and expressive aspects, although being more common in the expressive one. The diagnosis usually happens during childhood, but the difficulties,

which characterize it, persist throughout life. There is also a great probability of alterations in the development of written language². Thus, children with SLI, diagnosed in preschool phase, are of great risk for language disorder. That highlights the need of diagnosis and intervention the earliest possible³.

From a neuropsycholinguistic point of view, the difficulties present in the SLI, in both oral and written language, may be related to alterations in different levels of the linguistic information processing. Among these, there are the phonological process disorders (PP)⁴. The PP refers to the use of phonological information during oral and written language processing and its difficulty involves abilities with phonological working memory (PWM), lexical access (LA) and phonological awareness (PA)⁵.

The specialized literature has shown a great interest in researches on speech and language therapy for SLI. It presents studies which propose therapy programs based on different theories about the language development and acquisition process, contributing not only to verifying the efficiency of the procedures of interest, but also to the theoretical knowledge on the mechanisms involved in language⁶.

Few speech language pathologists follow the same individual with SLI throughout the year, so there aren't indicative factors of what can happen in this individual linguistic, academic and social future. The performance of longitudinal studies on this disorder is important so that speech audiologists are able to develop, from the data obtained in preschool phase, a direction to actions which promote the best development, enabling a therapy process plan aiming at, together with a multidisciplinary team, better opportunities for these individuals⁷.

Given the above, this study aimed at describing the clinic evolution of a case diagnosed with SLI, which was followed for 42 months at the Child Speech Clinic at FOB – USP.

■ CASE PRESENTATION

The study was conducted on the case of a female child diagnosed with SLI, who was attended from the age of 5 to 9 at the Child Speech Clinic at Bauru School of Dentistry (FOB – USP). The diagnosis was made by a psychological and speech evaluation, which confirmed the absence of hearing loss and intellectual deficit, besides a low performance in language tests and a persistent history of language alteration.

This study was approved by the FOB/USP Ethics Committee on Human Research (Process no 80/2007). The person responsible for the child signed the Informed Consent Form complying with

this study and its results propagation. The study was made by analyzing the biannual report data on the child Language performance in 7 different occasions. The data was in the clinical record of the child, and allowed the following of the case clinical evolution.

The speech and language therapy began when the child was five years old and was diagnosed with SLI. At this point, the child oral language alterations became clear, and the phonological aspect was the one showing a greater alteration. Thus, these data guided the case therapeutic planning. The initial complaint referred to phonological alterations with impairment in the speech intelligibility. The 42 month speech and language therapy results were analyzed.

The following procedures information was considered for the analysis of the follow-up assessments:

- Analysis of the spontaneous speech: assessment of the communicative functions and abilities, and semantic and syntactic aspects;
- ABFW Child Language Test – part A (phonology): assessment of the phonological system acquisition/ development⁸;
- Phonological Abilities Profile: assessment of the phonological awareness abilities⁹;
- School Performance Test – SPT: assessment of isolated words reading abilities, writing under dictation and arithmetics¹⁰;
- PROLEC – Reading Processes Assessment Tests: reading processes assessment¹¹.

The intervention process consisted of 192 45-minute sessions carried out twice a week for 3 years. Its purpose was to organize the child phonological system, aiming at the generalization and the speech intelligibility improvement. The therapy began by using the Modified Cycles Procedure¹², aiming at the emergence of new patterns of contrastive. In this phonological intervention model, each cycle lasted 3 weeks and one phonological process was worked in each week. One or two target sounds were approached in each process, each one being worked in one therapy session, and the other in the following session. The target sound was repeated if the child got a 20% or less accuracy in the stimulus words. After the 3 weeks, a probe was made in order to verify the generalizations accomplished by the child. When the child achieved more than 50% of correct productions, a second cycle was initiated with the same phonological processes of the first, but in sentence level. An auditory bombardment of a 15 word list with the target sound of the session was conducted at the beginning and end of each session.

The other oral language aspects (semantic, syntactic and pragmatic) were also considered in the therapeutic process, but they were not considered as main purposes. The therapy sessions were divided in order to spend more time working with phonology compared to the other approached aspects.

Reassessments were performed every beginning of semester. The abilities showing alteration in the beginning of the previous semester were assessed again through the same assessment procedures. In each semester, new assessment procedures were included as other alterations became clear. The written language assessment started after the age of seven when the child began the literacy process at school. The assessments demonstrated deficits in the phonological processing throughout the intervention. Although an alteration was observed in the phonological system in the beginning of the intervention, no other deficits in the phonological processing was observed. At this point, only the phonological awareness and working memory abilities were assessed since the procedure assessing the lexical access does not show a standard for the age of 5 (the child's age when therapy began).

Thus, the work with such abilities was included in the therapeutic planning. It is important to make clear that the work done with the phonological abilities processing differs from the specific work of the phonological aspect carried out in the case being reported, through the Cycles Procedure, as they are distinct abilities of the phonological aspect. Phonological processing abilities are not the same as phonological abilities as the first act in the information processing, which is phonological information in the oral language.

The work was carried out through ludic activities and according to the Psycholinguistic Model. In this model, the intervention program is individualized as to eliminate not only the symptomology presented by the children but also the psycholinguistic processes which produce such symptomology, emphasizing the information processing. The therapeutic strategies were developed, mainly, to promote the working memory development, helping the formation of more accurate phonological representations; to make the child more aware of the structural and functional aspects of the language through phonological and word awareness activities; to make the child able to access the representations in the mental lexicon.

Due to the deficits which were present in the written language assessment, the work with the reading and writing abilities was included in the phonological therapeutic planning after the age of 7. These activities were planned in order to promote

the phoneme-grapheme correspondence, the writing construction and the effective use of reading.

The child is still attending speech and language therapy and, nowadays, both oral and written language are worked in a related and concomitant way.

■ RESULTS

As detailed information on the whole intervention process was already provided in the data presentation, we will now explore in a summarized and directed way the differences presented by the studied case in its pre and post intervention moments. The considerations to be made regarding the intervention process as a whole will be held again in the discussion of the case.

The data reported by the family concerning the pregnancy and child birth did not indicate interurrences (term birth with 2455 grams and 45 centimeters long). No neuropsychomotor development delay was reported (the child sat with no support at eight months old, crawled at 10 months old and started walking at one year and one month old).

Babbling happened at six months old and the production of the first words at about one year old. Alterations in many oral language aspects (Figure 1) were demonstrated in the pre intervention assessment (5 years old), with a greater impairment in the phonological aspect.

In the end of the 42 month intervention, there was evolution in the phonological aspect. However, such evolution is not yet observed in the spontaneous speech (Figure 1). We emphasize that evident evolutions of the semantic, syntactic and pragmatic aspects were observed (Figure 1) even with an indirect intervention in the other language aspects.

The assessment of the phonological awareness abilities showed that at the age of 7 the child presented a development below the expected for the age (33 points), not being able to perform the segmentations of sentences, addition of phonemes, subtraction and syllable reversal tests. But at the age of 9 (last assessment), the performance was as expected (29 points).

Regarding the written language, deficits were observed in both reading and writing, demonstrating a performance below the expected for the chronological age and school level. Both SPT and PROLEC were only applied in the last assessment as the child did not have enough reading and writing level to perform the tests in previous assessments.

At the age of 9 and attending the 4th grade, the child showed an average performance below the 1st grade in the SPT for the writing (3 points), reading (4 points) and arithmetic (23 points).

Assessed aspect	Pre intervention assessment (5 year old child)	Reassessment after a 3 year intervention (8 year old child)
Phonology (Phonological Processes)	<i>Unexpected:</i> velar posteriorization; devoicing of plosive fricative plosivation; liquid simplification and deviant processes. <i>Expected:</i> consonant cluster simplification and final consonant simplification. Occurrences in both direct assessment and spontaneous conversation.	No occurrences of phonological processes in direct assessment. Spontaneous conversation: Palatal Fronting, unsystematic consonant cluster simplification
Speech intelligibility	Very impaired	Little impaired
Semantics	Restrict use of words with lexical meaning, such as verbs, nouns and adjectives; Semantic deviations; Absence of words with grammatical meaning.	Use of words with lexical meaning, such as verbs, nouns and adjectives; Absence of semantic deviations; Use of words with grammatical meaning, such as pronouns and adverbs.
Syntax	Production of affirmative, interrogative (without interrogative pronouns) and negative sentences (with displaced adverb) simple sentences; Does not master the rules of verbal and nominal concordances; Understanding of simple and complex orders.	Production of affirmative, interrogative (with interrogative pronouns) and negative sentences (with placed adverb) compound sentences consisting of subordinate clause. Master the rules of verbal and nominal concordances.
Pragmatics	Initiation and maintenance of communicative shifts. Presence of communicative functions, such as: instrumental, heuristic, nomination, protest and interactive. Beginning of the narrative, unable to tell or retell a story.	Good use of conversational abilities with adequate resources for changing the conversation theme, presence of self correction when realizing not to be understood, restructuring one's enunciation and organizing one's speech Uses all the communicative functions successfully and presents the narrative.

Figure 1 – Oral language assessment pre and post intervention

A performance below the expected (great difficulty) was verified in the PROLEC in all the assessed tests except for the comprehension of sentences (identification of letters: 17 points; same-different: 19 points; lexical decision: 23; word reading: 12; pseudo word reading: 12; grammatical structures: 10; punctuation: 2; sentence understanding: 11; comprehension of texts: 6).

■ DISCUSSION

Given the importance of the diagnosis of communication disorders, epidemiological studies aiming the early intervention¹³, among other actions, have been conducted in the field of speech. The interest in conducting researches related to speech therapy intervention in language disorders have increased over the years^{6,14}.

In cases of SLI as well as in other language disorders, the early diagnosis is essential for a good

prognosis since such alterations may interfere in a negative way in the child school aspect¹⁵. In the case reported, the child received a diagnosis of SLI only at the age of 5, which is considered a late age, and there were impairments, as described, in the written language development and acquisition process.

The occurrence of development phonological processes and the presence of idiosyncratic processes¹⁶ are frequent in SLI. The initial complaint of the presented case referred to phonological alterations with impairments in the speech intelligibility. It was verified by the pre intervention assessment which demonstrated alterations in varied aspects of oral language with a greater impairment of the phonological aspect. Studies show that children with this disorder are less effective in communicating because of their speech intelligibility. Affecting, therefore, the social aspect as it impairs the interaction with the pairs^{17,18}.

The construction process of the phonological representations, that is, the storage of phonological

information on the words in the long-term memory, is still not enough understood, particularly in SLI children cases. A study verified that there are deficits in these children phonological representation when compared to children with a typical language development. Such difference in performance can be explained by the difference in the formation and retention of representations in the working memory, auditory discrimination and motor planning and execution. The authors argue this shows the importance of assessment and therapeutic approach in this aspect by allowing a better targeting of the therapeutic process since such representations are essential to both the phonological awareness development and the written and oral language¹⁹.

Phonological alterations in children with SLI were also found in another study which showed these children present difficulties related to the phonological system development²⁰.

The search for the phonological system organization must be one of the goals to be achieved within a therapeutic planning. Nowadays, there are many options of phonological based therapeutic models to act in children with phonological disorders²¹. Such models attempt to make communication more effective by restructuring the phonological system, aiming at generalization²². The Modified Cycles Procedure¹² was chosen to be used in the case presented. This procedure aims at facilitating the emergence of new sound patterns through the intervention in cycles. Other studies which also used this procedure verified an evolution in the phonological aspect^{21,22}. It is worthy highlighting that such studies show there is no difference regarding the variety of models used in the intervention of the phonological aspect since all of them are efficient in their action and adequacy specificities to the cases they were applied²² and they also provide an increase in the percentage of correct consonants, in the number of phonemes acquired and in the types of generalizations²⁰.

Deficits in the phonological aspect are not the only observable ones in SLI cases. A remarkable feature of the SLI is the heterogeneity of linguistic manifestations. As verified in this study, deficits in learning and in language use can also be observed, besides morphosyntactic difficulties and lexical deficits, which are the first observable signs of disorder²³, and alterations in pragmatic abilities.

Language can be understood as a highly complex mental function, which is composed of linguistic aspects and an interconnection of its syntactic, semantic, phonological and pragmatic aspects. These aspects don't develop their functions isolated, but together²³. The intervention

in such aspects, although carried out indirectly, demonstrated an evident evolution.

The specific literature also shows that deficits in the abilities which form the phonological processing, that is, in the phonological working memory abilities, phonological awareness and lexical access²⁴, are evident in these cases. This process refers to the operations of information processing based on speech, that is, the phonological structure of oral language²⁵. The specific literature shows a positive correlation between the phonological operational memory and the phonological alteration severity index in children with SLI²⁶.

In this case, it was possible to observe difficulty in the working memory with limitations in the lexical access during the therapeutic activities throughout the speech language intervention. After an intervention which was aimed at this aspect, only the phonological awareness ability showed to be adequate (last follow-up assessment – 42 month intervention). Studies show that with the advance of the literacy process, an evolution of the phonological awareness ability also occurs. Based on the findings of literature, the authors claim that the phonological awareness occur in parallel with the development of literacy; however, they initially do not have a high level of dependence. As the literacy improves, the phonological awareness is also shaped and both walk together helping the child in improving the cognitive functions, reflecting throughout the learning construction process²⁷.

In the last two decades, the investigation conducted in this area has highlighted the importance of abilities which involve the phonological processing in the acquisition of the written language skills. In parallel, limitations in one or more of these abilities may be the explanation of phonological disorders, lexical acquisition and comprehension difficulties present in individuals with SLI, which, consequently, may explain the alterations, often present, in the written language development⁴.

Regarding the written language, the child here studied showed deficits in both reading and writing, demonstrating a performance below the expected for chronological age and school level. The child performance in dictation showed many occurrences of orthographical errors in the phoneme-grapheme conversion category, demonstrating the lack of mastery in the letter/grapheme choice to represent a specific sound/phoneme, there was also an elevated number of random substitutions followed of omissions, voiced/unvoiced substitutions and inversions.

In a qualitative analysis of the spontaneous writing, the child showed not mastering the cursive letters; she used block letters in most of her graphic

productions. Regarding the reading, a specific assessment demonstrated reading impairment through the phonological route in syntactic processes (ability to process different kinds of grammatical structures and use of punctuation) and semantic processes in relation with text understanding. An adequate performance was shown for sentence understanding.

Written language alterations in subjects with SLI have been described in literature, being, in a certain way, expected in these cases^{2,16}. This may be explained by the influence that oral language phonological aspect has in the development of written language⁴. The child is expected to be a successful speaker in the native language by the time of starting the formal learning of the written code. The oral language has a great importance for further literacy²⁸. So, when impairments are observed in oral language in this initial period of learning, the probability of occurring difficulties in the written language acquisition process is greater when compared to situations with no such impairment²⁹. That happens as the Portuguese Language is an alphabetical language, that is, there is a correspondence between grapheme and phoneme and vice versa. Thus, the reading and writing processing operations are initially based on the phonological structures of oral language and involve the conceptual organization, the lexical representation and the working memory, which access and recovers the representations related to the speech sounds³⁰.

Another prerogative of the written language difficulties shown by children with SLI is the association, proven by specific literature, between the performances on reading and writing tests and phonological processing tests, which suggests the difficulties in these processing abilities may explain these subjects' difficulties in written language^{4,31}. This association may be due to the fact that, as it occurs in the oral language processing, in order for the individual express the language in writing, he will

also use the abilities which are part of the phonological processing. In this processing, the individual must access, through the lexical access ability, the information stored in the long term memory, through the whole process which involves the phonological working memory, besides using the phonological awareness. If such abilities are impaired, consequently, the written language is also subject to presenting alterations⁴.

The individuals with SLI continue, throughout their development, showing language and learning problems with educational and social consequences for the whole life⁷.

This case therapeutic planning was designed to work the phonological processing abilities and reflect positively in the written language acquisition and development process. It was possible to verify in the post intervention assessment that although the child shows a delayed performance for her school grade, she has been presenting an evolution in the writing construction and showing a greater interest and motivation in performing activities involving, mainly, the reading, and also presents a good evolution in the understanding of the read text.

■ CONCLUSION

In the studied case, there was lower phonological evolution in relation to other oral language aspects, and it is possible to notice the great influence the oral language, particularly with respect to phonology, brought to the written language acquisition process. These findings warn us about the importance of an early diagnosis for a good prognosis and an early start of the speech language intervention process. Even though a case study may not reach broader conclusions, we also attempted to demonstrate the potential development of children with SLI.

RESUMO

O objetivo deste estudo foi descrever a evolução clínica de uma criança do gênero feminino, nove anos de idade, com diagnóstico de Distúrbio Específico da Linguagem atendida na Clínica de Linguagem Infantil da FOB-USP. Realizou-se acompanhamento longitudinal, por meio de análise de prontuário e filmagens. A intervenção fonoaudiológica iniciou quando a criança apresentava cinco anos com queixa de alterações fonológicas e prejuízos na inteligibilidade de fala. Constatou-se processos fonológicos não mais esperados para a idade, alterações semântico-lexicais, sintáticas, pragmáticas, e em processos perceptivos auditivos, estando a linguagem receptiva preservada. A intervenção teve como principal objetivo a organização dos subsistemas linguísticos principalmente da habilidade de processamento de informações. Após um ano, houve evolução dos aspectos trabalhados, exceto do aspecto fonológico, que teve evolução menos significativa. Atividades direcionadas a linguagem escrita foram inseridas quando a criança iniciou o ensino fundamental. Após 42 meses de intervenção, houve evolução do aspecto fonológico. Entretanto, esta evolução ainda não é observada na fala espontânea. As alterações neste aspecto exercem grande influência no desempenho da linguagem escrita. A habilidade de consciência fonológica está adequada, entretanto, há dificuldade na conversão fonema/grafema, resultando em desempenho aquém do esperado na linguagem escrita. Ainda, há comprometimento no processamento da informação linguística, além de persistência nas alterações, que acarretam defasagens no processo de alfabetização. Acreditamos que para conduzir o processo terapêutico é necessário compreender a natureza das dificuldades linguísticas, desenvolvendo estratégias específicas voltadas principalmente ao processamento da informação linguística e a aprendizagem, proporcionando habilidades e capacitando o indivíduo para a participação ativa em ambientes sociais e escolares.

DESCRITORES: Linguagem Infantil; Fonoaudiologia; Evolução Clínica

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